

DYNAMICS OF PLAGIOCLASE TEXTURAL EVOLUTION AND THE IMPACT OF THERMAL HISTORY ON NUCLEATION

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Abstract

The solidification history of silicate melts strongly controls melt composition and the textures and compositions of crystalline phases. In particular, increasing supersaturation markedly affects crystal nucleation and growth dynamics. Here, we investigate how different crystallization paths influence plagioclase nucleation and crystal habit. Three sets of solidification experiments were performed at atmospheric pressure using a crystal-poor anhydrous andesitic starting material containing plagioclase fragments: (1) isothermal experiments across super- and sub-liquidus conditions, (2) continuous cooling from super-liquidus conditions, and (3) cooling runs held at final temperature. To evaluate the effect of initial superheating, we repeated the isothermal and continuous cooling experiments with a crystal-free melt pre-heated to 1450 °C from a higher initial temperature. Isothermal runs produced numerous small, homogeneous crystals, reflecting spontaneous nucleation. Continuous cooling promoted both growth and nucleation, yielding euhedral to dendritic plagioclase habits with increasing cooling rate. Greater initial superheating or nucleation suppression led to fewer but larger dendritic crystals, similar to those in the fastest cooled seeded runs. These results demonstrate the strong control of thermal pre-treatment on crystal habit and clarify the relative roles of homogeneous and heterogeneous nucleation. Superheating suppresses nucleation by reducing sites for heterogeneous crystallization, favoring growth-dominated textures with limited morphological variability. Although sample edges and Pt wire promote early crystallization, most nucleation occurs on heterogeneities such as gas bubbles, seeds, or impurities, suggesting that homogeneous nucleation may be indistinguishable from heterogeneous nucleation on nano- to micrometric heterogeneities.

Introduction

The progressive crystallization of a silicate melt to form a fully solidified rock is controlled by thermodynamic disequilibrium, characterized by the degrees of supersaturation and undercooling ($-\Delta T = T_{liq} - T$; with T_{liq} corresponding to the liquidus temperature). Crystallization involves both nucleation (controlled by supersaturation and undercooling) and growth (controlled by diffusion in the liquid and the rate of atomic attachment at the crystal surface). Of these, nucleation plays a primary role in controlling the final microtexture, including the crystal number, size, and habit (Swanson 1977; Berkebile and Dowty 1982; Lofgren 1983; Fokin et al. 1999; Auxerre et al. 2022). Theoretical insights into nucleation processes have been developed through classical nucleation theory (CNT; Volmer and Weber 1926; Becker and Doring 1935). According to CNT, nucleation involves the continuous appearance and disappearance of clusters of atoms (embryo) due to diffusive fluctuations in the melt below the liquidus temperature. An embryo becomes a stable nucleus only if its radius r exceeds the critical radius r^* (m), beyond which the volumetric bulk free energy gain (ΔG_V) from the phase change overcomes the interfacial energy cost (σ ; J.m⁻²) associated with the crystal–melt boundary.

The thermodynamic barrier (ΔG^*) that must be overcome to produce a macroscopic grain ($r > r^*$) is expressed as:

$$-\Delta G^* = (4/3) \times \pi \times (r^*)^3 \times \Delta G_V + 4\pi (r^*)^2 \times \sigma \quad (1)$$

The steady state nucleation rate for the formation of spherical critical nuclei (J , m⁻³ s⁻¹) as a function of the temperature (T , in K) is expressed as:

$$J = J_0 \times \exp\left(\frac{-\Delta G^* + \Delta G_D}{k_B T}\right) \quad (2)$$

with J_0 the pre-exponential term, k_B the Boltzmann constant, and ΔG_D the kinetic barrier to the attachment of atoms to a cluster.

Because ΔG^* decreases with increasing undercooling, the critical nucleus size decreases as temperature decreases, increasing the nucleation rate. However, nucleation is not instantaneous, and a nucleation delay is commonly observed (Kashchiev 1969). Although CNT and its alternatives (Schmelzer et al. 2018, 2019) reliably describe the behaviour of chemically simple Li- and Na-metasilicate melts (with congruent melting points; Lasaga 1998; Fokin et al. 2006), it does not accurately account for observations in natural multicomponent systems such as magmas (Rusiecka et al. 2020), especially in dynamic regimes involving temperature variations.

Accordingly, there remain many open questions concerning the influence on nucleation of factors such as thermal history (e.g., cooling rate, initial degree of superheating, final dwell time), liquid composition (with the critical cooling rate—defined as that required to produce a glass, i.e. cooling to the glass transition temperature over timescales shorter than the nucleation delay—increasing by more than three orders of magnitude, from 0.0167 °C/min in rhyolitic to 30 °C/min in basaltic compositions; Vetere et al. 2013), and the nature of nucleation (heterogeneous vs. homogeneous).

The simplest form of *CNT* concerns homogenous nucleation, which assumes an equal probability of nucleation throughout the liquid (James 1974; Kirkpatrick 1976, 1977). In contrast, heterogeneous nucleation occurs on substrates such as bubbles, container walls, or pre-existing crystals (Davis and Ihinger 1998; Berkebile and Dowty 1982; Bonechi 2020). However, the effects of the nature of the substrate and liquid composition on crystallization rate are only partly understood. The thermal history of a melt before crystallization can be important, with a high degree of superheating resulting in the dissolution of potential sites of heterogeneous nucleation and an increase in the degree of undercooling required to form stable nuclei (Donaldson 1979; Berkebile and Dowty 1982; Vetere et al. 2013).

Nonetheless, the overall impact of the degree of superheating on the final rock texture remains debated. For example, Tsuchiyama (1983), Mollo et al. (2012), and First et al. (2020) observed that above a certain degree of superheating (either sufficiently high temperature or a sufficient duration above the liquidus), no further additional effect is observed.

The aim of this study is to investigate experimentally the influence of thermal history (isothermal; cooling, both with and without a final dwell time) on the final microstructure (crystallized vs. vitrified) in a natural andesitic composition. Particular attention is placed on characterizing the nucleation process and identifying which parameters most strongly influence it. To shed light on the ongoing debate between heterogeneous vs. homogeneous nucleation (Liu 2000; Špillar and Dolejš 2015; Holness et al. 2023) in some magmatic processes, we also evaluate the potential roles of different nucleation sites (e.g., Pt-wires, gas bubbles, preexisting seeds) in our experimental runs. Plagioclase was chosen as the target phase due to its abundance in both terrestrial (e.g., basaltic to dacitic magmas) and extraterrestrial rocks (e.g., lunar basalts; O'Hara et al. 1970). Moreover, because plagioclase, due to its more complex crystallographic network, is more difficult to nucleate than pyroxene or olivine (Fenn 1977; Donaldson 1979; Lofgren 1983), and its habit is particularly sensitive to cooling rate, melt composition, and superheating conditions (Bennett et al. 2019), this phase is an ideal probe for testing nucleation dynamics under controlled experimental conditions.

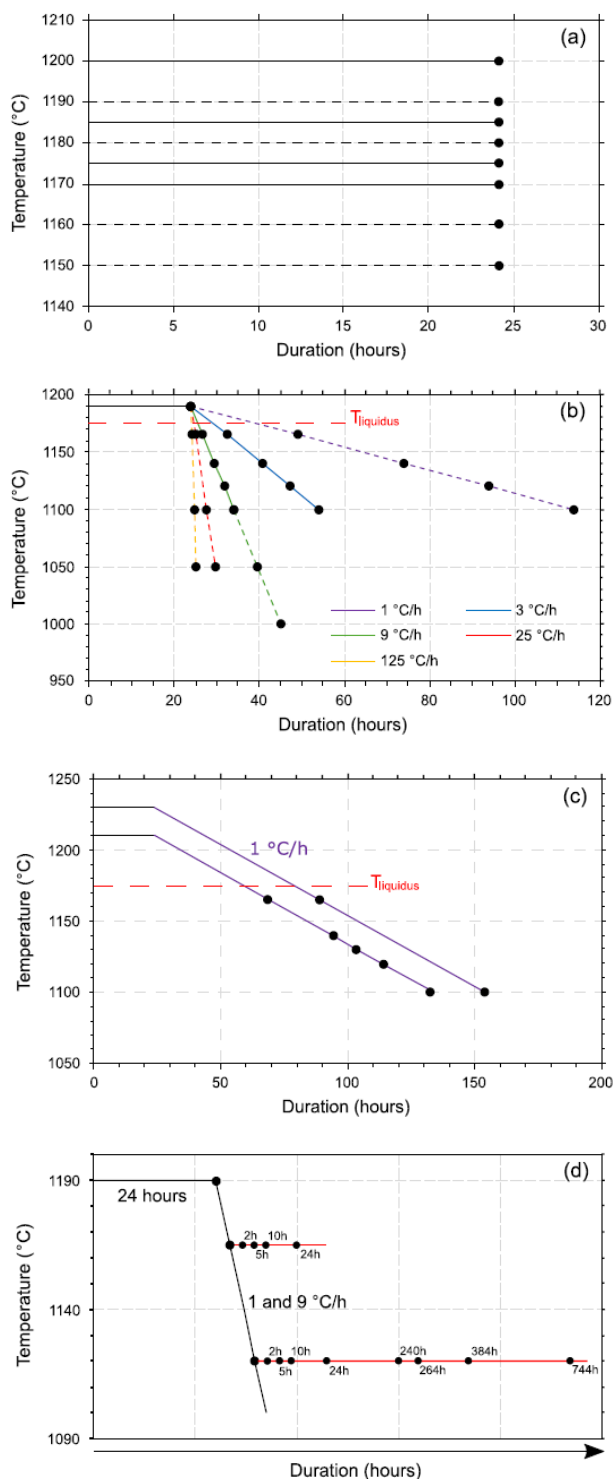


Fig. 1 Overview of the four temperature–time paths used in this study. Solid lines indicate experiments with OS36 (crystal-bearing) as the starting material; dashed lines indicate those with both OS36* (crystal-free, pre-heated to 1450 °C for 2 h) and OS36 as the starting material. **a** 24-h isothermal experiments initially used to determine the liquidus temperature. **b** Experiments cooled at 1, 3, 9, 25, and 125 °C/h after an initial 24-h isothermal step at 1190 °C. Runs were quenched at 1165, 1140, 1120, 1100, 1050, or 1000 °C. Experiments using OS36 cooled at 1, 3, and 9 °C/h are from Billon et al. (2025). **c** Experiments cooled at 1 °C/h, after an initial 24-h isothermal step at 1210 °C ($\Delta T = 35$ °C) or 1230 °C ($\Delta T = 55$ °C). Runs were

quenched at various temperatures between 1165 and 1100 °C. **d** Complex crystallization paths involving a cooling step similar to those in **(b)** at 1 and 9 °C/h, followed by final isothermal dwell times from 2 h to 31 days at 1165 or 1120 °C

Methods

STARTING MATERIALS AND EXPERIMENTAL METHODOLOGY

Two starting materials were used: OS36 and OS36* (**Fig. 1a**). OS36 is a finely ground powder (weighted mean grain diameter of 16 µm; maximum size = 90 µm; Supplementary file 3: Fig. S1) of a crystal-poor basaltic-andesite (analysed by Bechon et al. 2022; and used by Billon et al. 2025), and OS36* was obtained by heating a few grams of OS36 at 1450 °C for two hours in a muffle furnace to obtain a crystal-free glass (Supplementary file 1: **Fig. S1c**). This glass was then ground into powder using an agate mortar and pestle. XRF analyses of the two starting materials showed a relative difference of only 1 to 7% for most elements (Supplementary file 2), except for FeO_(t), which showed a relative difference of 15% (due to FeO contamination introduced during the 1450 °C heating of OS36* in a platinum crucible that may have retained residual iron from previous melting experiments). Surviving plagioclase fragments in seed-bearing runs had sizes ranging from 6 to 50 µm, with an average of ~ 16 µm (Supplementary file 1: Fig. **S1a** and **b**).

For each experiment, a ~ 50 mg powder pellet was placed on a 0.2-mm-diameter Pt wire loop previously equilibrated for 24 h at the final target temperature and oxygen fugacity, using the same sample composition, to minimize iron loss during the experiment (Grove 1982). Iron-saturated Pt loops were then mounted at the extremity of a ceramic rod positioned in the hot spot of a CARBOLITE GERO vertical furnace at University of Liege (Belgium). A subset of experiments were performed with the same methodology using a Nabertherm vertical furnace at KU Leuven (Belgium).

Following the approach of Faure and Tissandier (2014), we refer to the nominal degree of undercooling ($-\Delta T_n$), defined as the difference between the plagioclase saturation temperature in the starting material (T_{sat} , marking the nucleation of new crystals), and the quench temperature (T_f). The saturation temperature of 1175 °C measured by Billon et al. (2025) using isothermal experiments, agrees with that estimated using Rhyolite-MELTS v. 1.2.0 (1170 – 1175 °C; Gualda et al. 2012). However, experimental conditions such as superheating, decompression, or cooling rate can shift the onset of the crystallization by decreasing the temperature at which the nucleation begins (Lofgren 1983; Conte et al. 2006; Iezzi et al. 2008; Vetere et al. 2013). Therefore, when necessary, the saturation temperature was adjusted from the degree of superheating initially measured in our isothermal runs (ΔT_{iso} for $T_{\text{sat}} = 1175$ °C) to the “cooling” value (ΔT_{cool} ; Supplementary file 3: **Table S1**), based on the appearance of the first new crystals in our cooling runs.

We performed a total of 56 experiments exploring four thermal paths at atmospheric pressure: one isothermal path and three different cooling paths (**Fig. 1**). (1) In isothermal experiments (using OS36 and OS36* as starting materials; **Fig. 1a**), samples were held for 24 h at temperatures from 1200 °C to 1150 °C (T_{sat} , Plg = 1175 ± 5 °C; see Billon et al. 2025). The goal was to investigate the impact of initial plagioclase fragments on the textures developed at temperatures around the plagioclase saturation

temperature. (2) Cooling-rate experiments (**Fig. 1b**) were conducted on both OS36 (natural powder with plagioclase fragments) and OS36* (fully glassy material; **Fig. S1c, d**) to study the impact of initial crystal fragments. Samples were held at 1190 °C ($+ \Delta T = 15$ °C) for 24 h, then cooled at constant rates of 1, 9, 25, or 125 °C/h. Each run was quenched between 1165 and 1000 °C ($- \Delta T_n = 10$ –175 °C) to investigate progressive crystallization. The results of experiments on OS36 cooled at 1 and 9 °C/h have been presented by Billon et al. (2025). (3) High-superheating cooling histories (**Fig. 1c**) were performed only on OS36, which was held at higher super-liquidus temperatures (1210 or 1230 °C; $+ \Delta T = 35$ –55 °C) for 24 h, then cooled at 1 °C/h without the intermediate hold at 1190 °C, and finally quenched between 1165 and 1100 °C. This design aimed to study the influence of the magnitude of the initial superheating on crystallization behavior. (4) Cooling experiments with a final isothermal dwell were performed on OS36 in three steps (**Fig. 1d**). After being held at 1190 °C for 24 h, charges were cooled at 1 or 9 °C/h to 1165 or 1120 °C, then finally quenched after dwell times of 2, 5, 10, 24, 240 h (10 days), 264 h (11 days), 384 h (16 days), or 744 h (31 days).

The experiments were conducted under Ni-NiO equilibrium conditions ($\sim 97.5\%$ CO₂ and 2.5% CO, adjusted for different temperatures) with a gas flow rate of 0.07 cm/s, and samples were finally quenched in water.

ANALYTICAL TECHNIQUES

SCANNING ELECTRON MICROSCOPY (SEM)

The product of each experimental run was mounted in epoxy and prepared as a polished section. Whenever possible, samples were polished parallel to the platinum wire to maximize the accessible surface area. Polished sections were examined by SEM with a field-emission gun and backscattered electron (BSE) imaging at KU Leuven (TESCAN Mira4), RWTH Aachen (FEI QEMSCAN 650F), and Cambridge University (FEI QEMSCAN 650F). Imaging was performed at a working distance of 10–15 mm, a dwell time of 10 μ s, and an accelerating voltage of 15 kV (20 kV for energy-dispersive X-ray spectroscopy, EDS, with a beam current of 6–9 nA). Crystals and melt were analyzed using focused and defocused beam modes, respectively, with a beam current of 20 nA for plagioclase and 10 nA for the residual liquid. Analyses were conducted at 10 mm working distance and 15 kV accelerating voltage. Full analytical conditions, calibration standards, and chemical data are provided in Supplementary Files 1 and 2. As chemical analyses were not the main focus of this study, and semi-quantitative data were sufficiently representative (see Vetere et al. 2013; Billon et al. 2025), EDS was often preferred as a practical alternative.

IMAGE PROCESSING AND TEXTURAL ANALYSIS

We used the Weka Segmentation plugin of FIJI (ImageJ) to highlight relic cores and automate the quantification of plagioclase abundance (ϕ_v) from the BSE images (Schneider et al. 2012). Crystal outlines were drawn manually in Gimp, and 2D textural parameters (sectioned areas, roundness/circularity, length l and width w) were obtained using the best-fit ellipse method in FIJI. Full samples were typically imaged in several areas, away from the sample edges, at $\sim 750\times$ magnification to improve precision. Microstructural data from all sections from the same sample were then

compiled. Phase proportions (ϕ_v) and 2D (N_A) and 3D crystal number densities (N_V) (based on manual point counting in Fiji), as well as the global mean crystal size (S_N) were determined from the full images of each sample (equations provided in Supplementary file 1). Crystal size parameters (area, minor axis, and long axis of each crystal) were compiled into a single Excel spreadsheet. From this compilation, the $l_{\max, av}$ (average size of the 10 largest crystals) and l_{mean} (mean size of the entire segmented crystal population) parameters were calculated.

Nucleation and growth rates were calculated from the entire segmented crystal population of each experiment using the batch (G_{batch}), l_{mean} (G_{mean}), and $l_{\max}$ ($G_{\max}$) methods. We calculated incremental nucleation (J_i) and growth rates (G_i) (Couch et al. 2003) as the differences between two different dwell times at the same temperature; these rates were used to assess the evolution of crystallization during the final dwell periods of relevant experiments (equations provided in Supplementary file 1). A complete summary of our microstructural dataset is available in **Table 1** and Supplementary file 3. Importantly, crystallization duration (t) needs to be well defined. Accordingly, because the presence of pre-existing crystals may promote early overgrowth before the onset of nucleation, growth rates were computed from the onset of visible overgrowths. Nucleation rates were calculated from the first appearance of new crystals.

CRYSTAL SIZE DISTRIBUTIONS (CSDS) AND DIFFUSION-LIMITED GROWTH

CSD analyses were performed on BSE images of experimental samples using the 2D long axis of more than 100 crystals. All CSD diagrams and data are available in Supplementary file 4. The CSDCorrections method of Higgins (2000) was used to obtain the CSD curve by specifying the 3D crystal shape obtained using ShapeCalc (Mangler et al. 2022), the massive rock fabric, and roundness factor. Because dendritic plagioclase grains have more complex structures, potentially appearing as several fragments in 2D sections through the sample, their accurate segmentation is challenging. An incorrect determination of the contour of each crystal can have a strong impact on textural parameters (size, shape, and number of crystals), associated CSDs, and therefore resultant nucleation and growth rates. To solve this problem, we used the alignment and crystallographic orientation of each fragment, determined by electron backscatter diffraction (EBSD) using a MEB-FEG HITACHI SU5000 equipped with a Symmetry EBSD camera (Université de Lille, France), to guide image segmentation. Analyses were performed at an accelerating voltage of 20 kV, a beam current of a few nanoamperes, and a working distance of 15–20 mm. To ensure a good EBSD signal without carbon coating (detrimental for the EBSD signal), a partial vacuum of 30 Pa was applied. Details are provided in Supplementary File 1. To assess the impact of observed complex morphologies (particularly swallowtail crystals) on the obtained textural data (2D aspect ratio, 3D shape), the 2D aspect ratio distributions and 3D shape estimates were compared with those derived from a theoretical fully euhedral parallelepiped that was manually defined and segmented (Supplementary file 3). A 1σ error of 0.05–0.06 is generally associated with the S/I predictions; therefore, corrections assuming a fully euhedral crystal have no significant effect. In contrast, I/L predictions are highly variable, masking any potential effect of shape correction.

Table 1

Comparison of linear regression parameters for $\log(G_i)$ and $\log(J_i)$ versus $\log(t_{\text{dwell time}})$ obtained in this study and previous isothermal/isobaric experiments

Study	H ₂ O wt. %	Mineral	Log(G) = a × Log(t) + b						Log(J) = a × Log(t) + b		
			G _{mean}			G _{max}			J _{Batch}		
			a	b	R ²	a	b	R ²	a	b	R ²
Our data	0	Pl	-1.14	-2.42	0.93	-1.21	-1.67	0.83	-1.28	8.1	0.88
Cabane et al. (2005)	0	Pl	-1.18	-3.54	0.89	-	-	-	-	-	-
Cabane et al. (2005)	0	Ol	-0.81	-4.57	0.93	-	-	-	-	-	-
Pontesilli et al. (2019)	0	Px	-	-	-	-1.14	-2.43	0.92	-	-	-
Pontesilli et al. (2019)	2	Px	-	-	-	-0.99	-3.07	0.59	-	-	-
Pontesilli et al. (2019)	0	Fe-Ti oxide	-1.29	-3.05	0.86	-1.13	-3.39	0.91	-	-	-
Pontesilli et al. (2019)	2	Fe-Ti oxide	-0.45	-6.25	0.19	-2.48	2.85	0.47	-	-	-
Arzilli et al. (2015)	<1	Pl	-	-	-	-1.23	-1.69	0.77	-4.23	18.87	0.81

Data correspond to different minerals (olivine, plagioclase, pyroxene, and Fe-Ti oxides) under dry and hydrous conditions

Results

ISOTHERMAL EXPERIMENTS

Experiments performed without pre-existing crystal fragments (OS36*) produced a homogeneous population of small ($l_{\text{mean}} = 5 \mu\text{m}$) euhedral, and tabular (lath-shaped; **Fig. 2a, b**) plagioclases ($w/l = 0.2\text{--}0.4$) surrounded by a visible compositional boundary layer in the melt at the extremities of the crystals' longest axes (**Figs. 2a, S4**). The crystal population exhibits a narrow size distribution, with similar l_{mean} and $l_{\text{max, av}}$ values (**Table 1**). In comparison, seed-bearing runs using OS36 produced rounded ($w/l = 0.6\text{--}0.8$) and larger ($l_{\text{mean}} = 9\text{--}13 \mu\text{m}$) plagioclases (**Fig. 2c, d**). The largest crystals ($l_{\text{max, av}} = 28\text{--}45 \mu\text{m}$) preserve evidence of overgrowth of seeds (see Billon et al. 2025; **Fig. 2c**). Below 1170 °C, isothermal experiments displayed higher crystal number densities ranging from 4.08×10^{-3} to $1.43 \times 10^{-2} \mu\text{m}^{-2}$ in runs without pre-existing crystals, and from 2.41×10^{-4} to $2.37 \times 10^{-3} \mu\text{m}^{-2}$ in runs containing pre-existing crystals. This difference is particularly evident in the CSDs, where the intercept increases from about $-13 \mu\text{m}^{-4}$ at 1180–1175 °C in seed bearing runs, to between -10 and $-9 \mu\text{m}^{-4}$ and reaches approximately $-7 \mu\text{m}^{-4}$ at 1160–1150 °C, in runs with and without initial crystal fragments respectively (Supplementary File 4). Both the intercepts and slopes of the CSDs, which increase with progressive crystallization, are consistently higher in OS36* runs compared to OS36 runs.

All isothermal experiments contained abundant gas bubbles (**Fig. 2a, d**) and are characterized by strongly heterogeneous crystal spatial distributions (especially in OS36* runs; **Fig. 2a**). Small spherical and agglomerated particles (**Fig. 2d**) particularly rich in FeO (~83 wt. %, with traces, ~5–7 wt. % of Ti, Mg and Al; probably magnetite), were present at 1150 °C in seed-bearing runs.

COOLING EXPERIMENTS

SEED-BEARING STARTING MATERIAL

Experiments containing plagioclase seed crystals (**Fig. 3a–c**; Supplementary file 1: **Fig. S2**) showed a progressive microstructural evolution with increasing cooling rate, from equant/tabular (with sharp

edges) at 1 °C/h, to skeletal/dendritic habits at 25 and 125 °C/h (**Fig. 3b, c**). As discussed by Billon et al. (2025), the internal morphology of the crystals often varied depending on crystal size (**Fig. 3a–c**), as highlighted by the steepening of the CSD slopes from -0.02 at 1 °C/h to -0.07 at 125 °C/h (Supplementary file 4), indicating accelerated growth (see **Fig. 9**). At the fastest cooling rates (> 25 °C/h), particularly at 125 °C/h, plagioclase evolved from resorbed textures around relic cores when quenched at 1165 °C to skeletal/dendritic (with principally hopper sections) at 1100 ($-\Delta T_n = 75$ °C) and 1050 °C ($-\Delta T_n = 125$ °C) (**Fig. 3b, c**). The largest crystals grown around the initial plagioclase fragments display complex habits comprising tabular overgrowths, dendritic extensions, and embayments (**Fig. 3c**, inset; Supplementary file 1: **Fig. S2k**). Magnetite and clinopyroxene typically crystallized at 1120 and ~ 1050 °C, respectively, at slow to moderate cooling rates (1–9 °C/h), but were absent at 25 and 125 °C/h, respectively (Supplementary file 3: **Table S1**). Aside from preferential nucleation around the Pt-wire, particularly during the beginning of crystallization, most nucleation appears to have occurred in the internal regions of each charge.

The plagioclase proportion (φ_V), density (N_A), and size (l_{mean} , $l_{\text{max, av}}$) at 25 remain comparable to those at 1 and 9 °C/h (Supplementary file 3: **Table S1**, **Fig. 4a, b**). In contrast, at 125 °C/h, a smaller plagioclase proportion is observed due to nucleation only beginning after the predicted 1175 °C value (**Fig. 4a**). For subsequent calculations concerning runs cooled at 125 °C/h, the liquidus temperature is adjusted to 1137.5 °C (the average between 1165 and 1110 °C). This delay explains the lower CSD intercept at 125 °C/h (compared to the increasing trend from 1 to 25 °C/h) in runs quenched at 1100 °C. This initial nucleation delay was compensated by a continuous increase in plagioclase number density between 1100 and 1050 °C.

The maximum crystal size ($l_{\text{max, av}}$) decreases with increasing cooling rate from 183 μm at 1 °C/h to 83–92 μm at 125 °C/h (**Fig. 4c**). At tested cooling rates, plagioclase crystals larger than 100 μm were rare ($< 1\%$), whereas crystals smaller than 10 μm were abundant ($\sim 40\text{--}50\%$). The abundance of small crystals only declined below 1100 °C, temperatures at which the availability of liquid and interstitial space diminished. At 1100 °C, N_A vs. cooling rate forms a bell-shaped curve peaking at 9 °C/h, reflecting liquidus depression and delayed nucleation at 125 °C/h. Testing various liquidus temperatures for the runs cooled at 125 °C/h, and different nominal undercoolings shows that the relationship varies. For $T_{\text{sat}} \approx 1137\text{--}1125$ °C, and a $-\Delta T_n = 75\text{--}87$ °C, N_A increases with cooling rate (**Fig. 4d**) when crystals are homogeneously distributed.

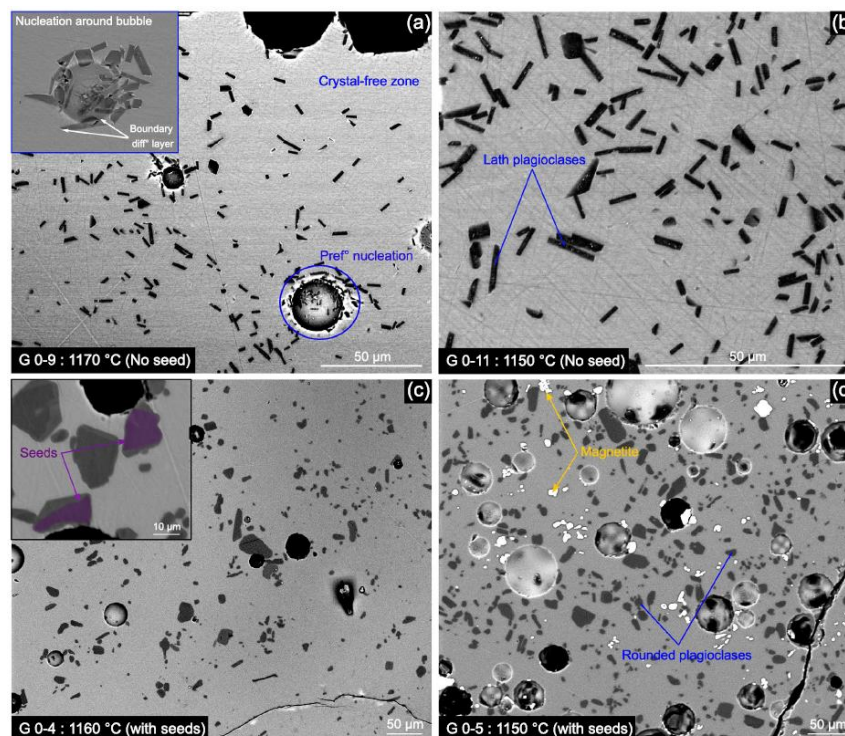


Fig. 2 Backscattered electron images of the microstructural evolution of plagioclase in isothermal experiments. **a, b** Experiments conducted without any pre-existing crystal fragments (OS36*). Preferential nucleation at the surface of gas bubbles is visible in **(a)**, and the crystal population is characterized by a lath-shaped morphology in **(b)**. **c, d** Experiments conducted with pre-existing plagioclase crystal fragments (OS36). Plagioclases are more rounded, with greater variability in size and 2D aspect ratio

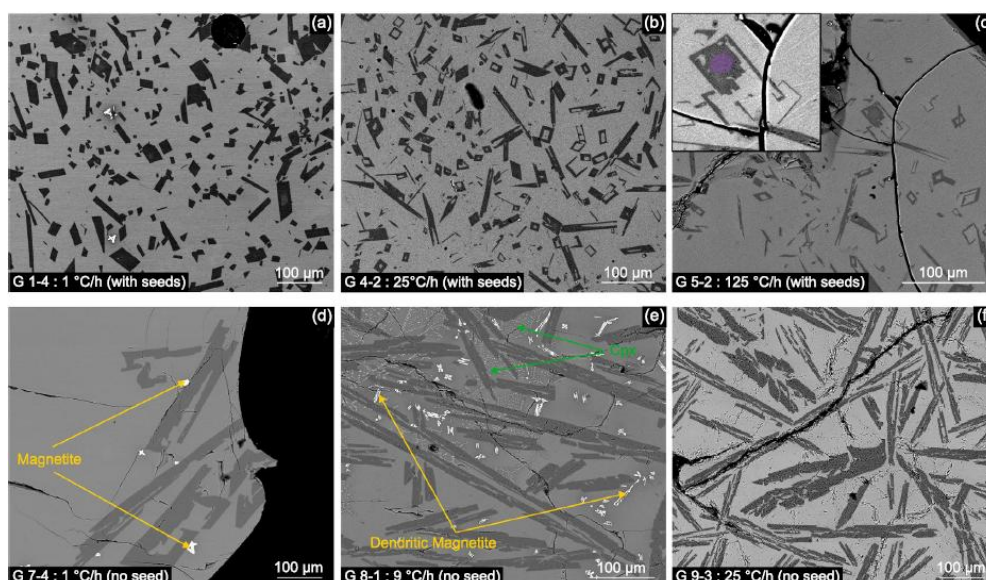


Fig. 3 Backscattered electron images of cooling experiments illustrating microstructural evolution. **a–c** Runs conducted with initial plagioclase crystal fragments (OS36) and quenched at 1100 °C after cooling at 1, 25 and 125 °C/h, respectively. Plagioclase habit evolves from euhedral at 1 °C/h **(a)** to skeletal at 25 and 125 °C/h **(b, c)**, and samples cooled at 125 °C/h show dendritic extensions **(c, inset)**. All OS36 cooling runs are characterized by highly variable crystal sizes. **d–f** Runs conducted with an initially fully glassy material (OS36*) and quenched at 1100 °C **(d, cooling at 1 °C/h)** and 1050 °C **(e, f, cooling at 9 and 25 °C/h, respectively)**. All OS36* cooling runs exhibit dendritic plagioclases, with microstructural complexity increasing from 1 to 25 °C/h

CRYSTAL-FREE STARTING MATERIAL

These experiments were performed on the glassy OS36* material (Supplementary file 1: **Fig. S3a–f**). They were initially held at 1190 °C (+ $\Delta T = 15$ °C) for 24 h, then cooled at 1, 9, 25, or 125 °C/h. These runs displayed heterogeneous crystal distributions when quenched above 1100 °C ($-\Delta T_n = 75$ °C) due to preferential plagioclase nucleation on the Pt-wires and charge margins (**Fig. 3d**; Supplementary file 1: **S4a**). At slow to moderate cooling rates (1 and 9 °C/h), plagioclase grains acted as heterogeneous nucleation sites for skeletal Fe-Ti oxides (~ 1100 °C) and spherulitic clinopyroxene (~ 1050 °C), as in seeded runs (**Fig. 3e**; Supplementary file 1: **S4f**). At increased cooling rates, plagioclase nucleation was delayed (indicated by low φ_v values in **Fig. 4a**): we obtained crystal-free glasses down to ~ 1100 °C at 25 °C/h and in all runs at 125 °C/h. Plagioclase habits evolved from elongated skeletal forms with a few tabular euhedral crystals at 1 °C/h to more complex, multi-branched dendritic structures with increasing degree of nominal undercooling and cooling rate (**Fig. 3f**). Similar dendritic morphologies were observed at 1050 °C (9 °C/h) and 1100 °C (25 °C/h).

Regardless of cooling rate, experimental runs starting with crystal-free glasses contained 1 to 2 orders of magnitude fewer plagioclase crystals, but those crystals had mean sizes up to 1 order of magnitude larger (**Fig. 3b**, Supplementary file 3: **Table S1**; see CSDs in Supplementary file 4); with a lower variability in size ($< 1\%$ of crystals smaller than 10 μm) and shape ($w/l \leq 0.2$) (**Fig. 3d, f**). This restricted range of 2D aspect ratios explains the accurate 3D shape estimations ($R^2 = 0.98\text{--}0.99$) obtained using ShapeCalc.

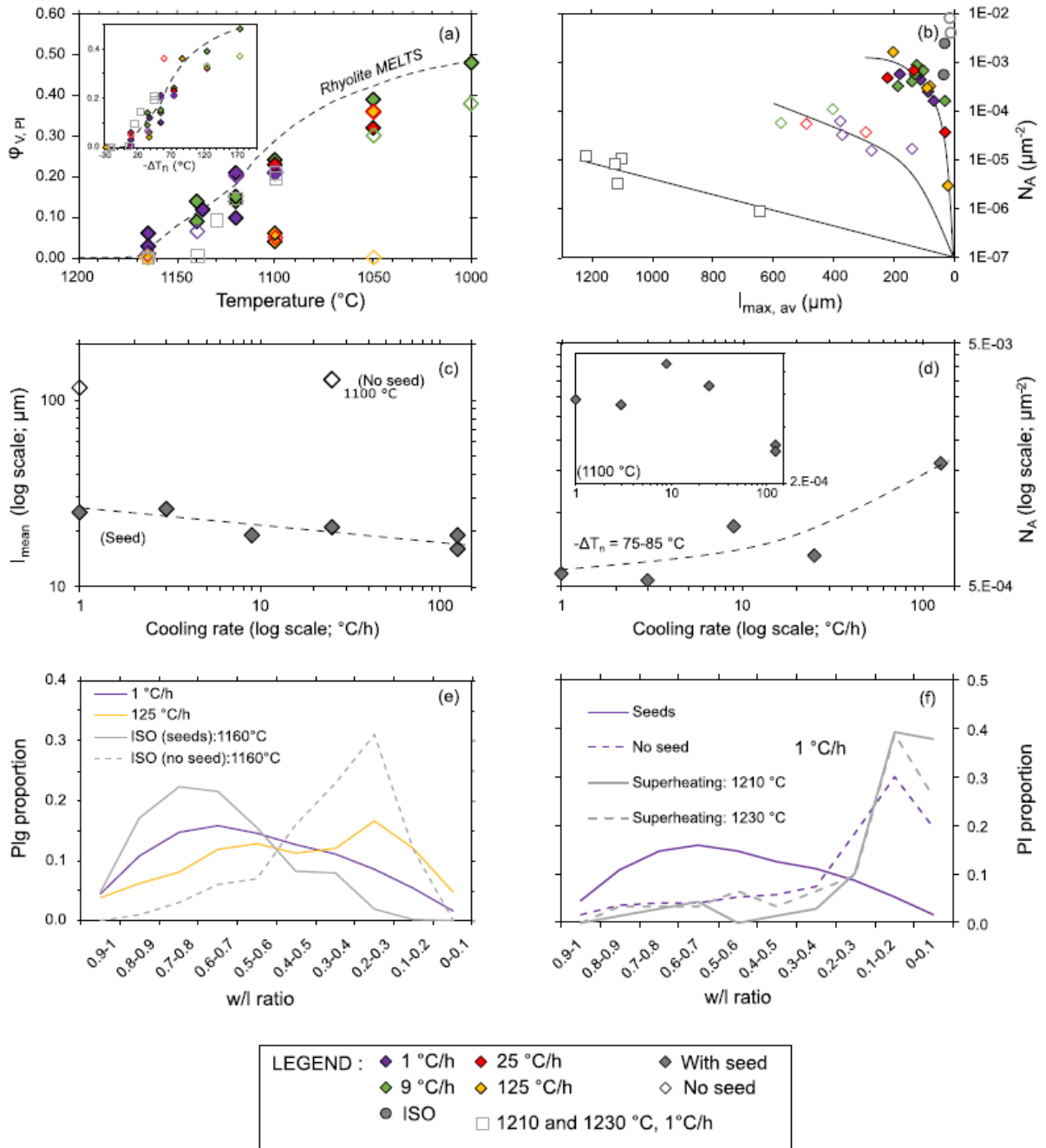


Fig. 4 Plagioclase microstructural data from cooling experiments. **a** Volumetric plagioclase proportion ($\phi_{V,PI}$) as functions of temperature (outset) and degree of effective undercooling $-\Delta T_n$ (inset; corrected for depression of the liquidus temperature). **b** Plagioclase crystal number density (N_A) vs. maximum crystal size ($l_{max,av}$). **c, d** Average crystal size (l_{mean}) and crystal number density (N_A), respectively, as functions of the cooling rate. The inset in **(d)** shows how N_A evolved with cooling rate for the same quench temperature of 1100 °C. **e, f** Plagioclase aspect ratio (w/l) distributions **(e)** as a function of cooling rate and **(f)** variations associated with the initial pre-heating step

SLOW COOLING FROM HIGHER DEGREES OF SUPERHEATING

This series used the OS36 starting material superheated to 1210–1230 °C ($+\Delta T_{th} = 35-55$ °C) for 24 h and then cooled at 1 °C/h (Supplementary file 1: **Fig. S3g-i**). In total, including the isothermal step and part of the cooling, these experiments lasted for a prolonged period of 59–79 h above the theoretical

liquidus temperature of 1175 °C (**Fig. 1c**). Similar to cooling experiments on OS36* cooled at 25 °C/h, nucleation was delayed by 30–35 °C (Supplementary file 1: **Fig. S3g**), only beginning around 1145 °C instead of 1175 °C. Nucleation occurred exclusively on Pt-wires and charge margins, and the dendritic plagioclase habits (**Fig. 5a**) are very similar to those observed in cooling experiments on OS36* at 9 and 25 °C/h (**Fig. 5b, c**). In contrast to experiments containing initial plagioclase seeds that started at a low degree of superheating, all plagioclase crystals exhibited complex twinning patterns produced by rapid growth (Brugger and Hammer 2015; Xu et al. 2016; Supplementary File 1). Fe-Ti oxides and clinopyroxenes were absent.

Plagioclase crystal number densities (N_V) ranged from 10^{-8} to $10^{-7} \mu\text{m}^{-3}$, and average maximum lengths ($l_{\text{max, av}}$) reached 1100–1200 μm (**Fig. 4b**). As in the OS36 cooling experiments, the crystals again exhibited a very restricted range of sizes (Supplementary file 3: **Table S1**) and aspect ratios ($w/l = 0\text{--}0.2$; **Fig. 4f**), corresponding to bladed or tabular habits.

All series performed using a crystal-free initial material (either using OS36* or an initial strong degree of superheating between 35 and 55 °C) are characterized by a high proportion of large crystals (40–80% of crystals being larger than 100 μm), an almost complete absence of small crystals ($\leq 10 \mu\text{m}$, Supplementary file 3: **Table S4**), and similar dendritic to bladed habits (**Fig. 5a–c**).

COOLING EXPERIMENTS WITH A FINAL ISOTHERMAL DWELL

MICROSTRUCTURAL OBSERVATIONS

Figure 6 illustrates the microstructural evolution during the final isothermal step, from an immediate quench at the final temperature (0 h) to dwell durations of 31 days. For a given cooling rate and final temperature, both the overall microstructure and plagioclase modal abundance remained relatively stable at around 0.02 at 1165 °C and 0.18 at 1120 °C (as predicted by Rhyolite-MELTS; **Figs. 6a–e, 7a**). Both the occurrence of tabular crystals (**Fig. 7d**), and crystal size (l_{mean} , l_{max}) increased with increasing dwell time, whereas the number density decreased (**Fig. 7b**). Accordingly, the proportion of small crystals ($< 10 \mu\text{m}$) decreased from 30–68% initially to 2–10% depending on the cooling rate and final temperature, and the proportion of the largest crystals ($> 100 \mu\text{m}$) increased steadily (**Fig. 7e**; Supplementary file 3: **Table S4**). The proportion of crystals $< 10 \mu\text{m}$ dropped below 5% at 1120 °C ($-\Delta T_n = 55 \text{ °C}$), suggesting slowed or arrested nucleation. Crystal sizes stabilized after 24 h (**Fig. 7c**).

In experiments held at 1165 °C, the most pronounced changes occurred during the first two hours of the dwell time, in which the proportion of small crystals fell from 40 to 10% at 1 °C/h, and from 70 to 28% at 9 °C/h (Supplementary file 3: **Table S4**). At 9 °C/h, long-duration experiments (> 11 days) showed a second episode of nucleation, with N_A increasing from 2×10^{-4} to $3\text{--}3.5 \times 10^{-4} \mu\text{m}^{-2}$, and smaller crystals formed around the sample edges (**Fig. 6f**), with more tabular habits in contrast to the earliest elongated skeletal/dendritic forms. The first large euhedral pyroxene crystals were also observed in experiments quenched after 31 days.

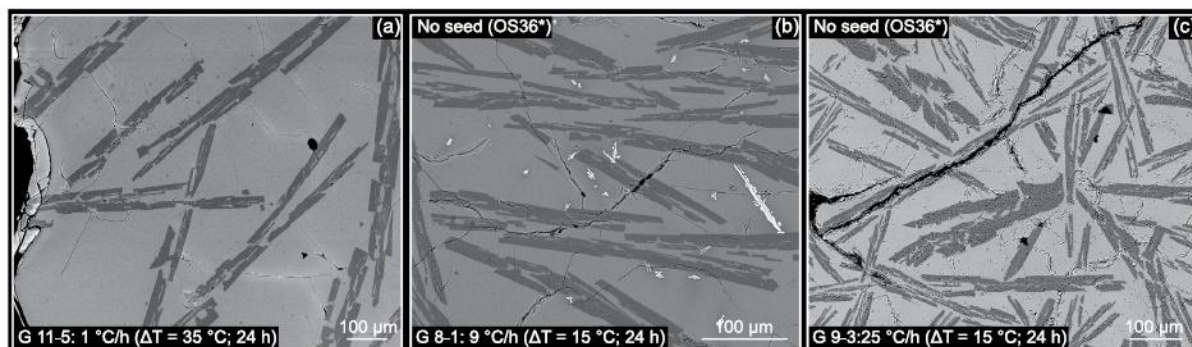


Fig. 5 Backscattered electron images of cooling experiments conducted from various degrees of superheating. **A** Run (starting material OS36) superheated to 35 °C for 24 h above the liquidus, cooled at 1 °C/h, and quenched at 1100 °C. **b, c** Runs (starting material OS36*) cooled from 1190 °C (+ $\Delta T=15$ °C at 9 and 25 °C/h, respectively, and quenched at 1050 °C; shown here for comparison. Note the similar plagioclase habit in the three panels, particularly in (a) and (b)

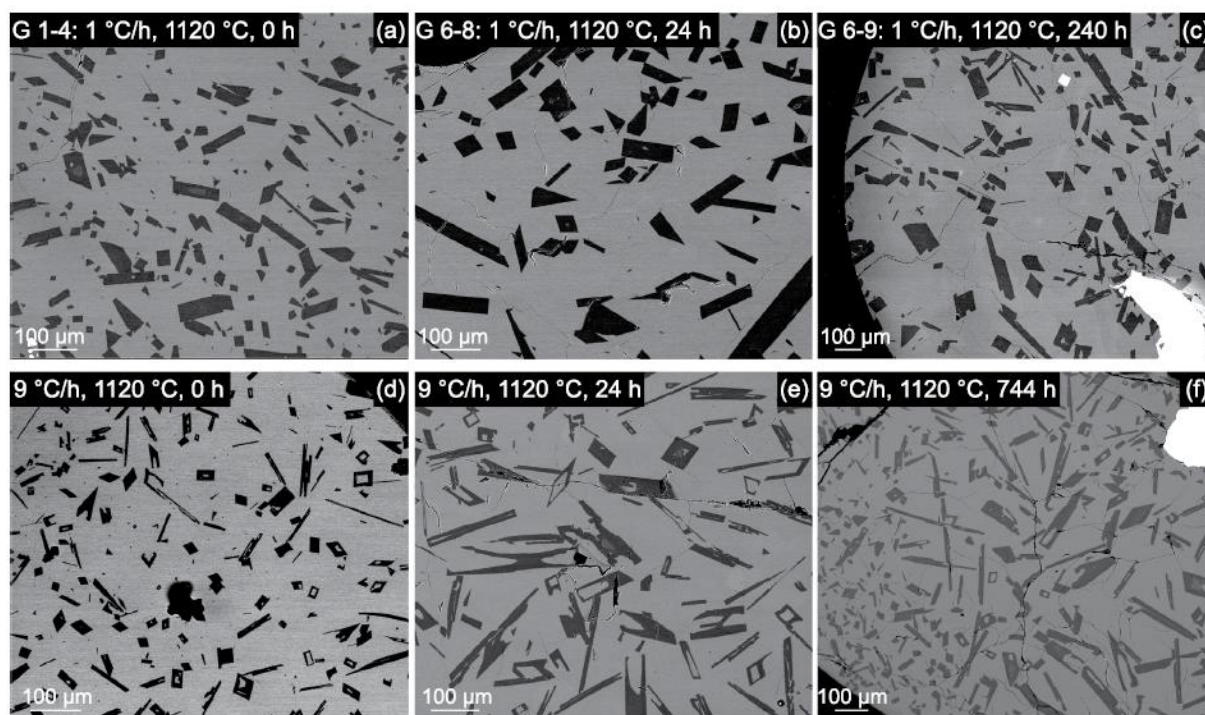


Fig. 6 BSE images of experiments held isothermally at 1120 °C after an initial cooling at **a–c** 1 °C/h and **d–f** 9 °C/h. Larger plagioclase crystals observed at longer dwell durations (**b, d**) are associated with a decrease in the abundance of smaller crystals (**b, c, e**). Except for a second nucleation and growth event that produced abundant tabular crystals in the charge margins, distinct from earlier skeletal habits after cooling at 9 °C/h and a 31-day dwell time (**f**), no significant textural modifications are observed

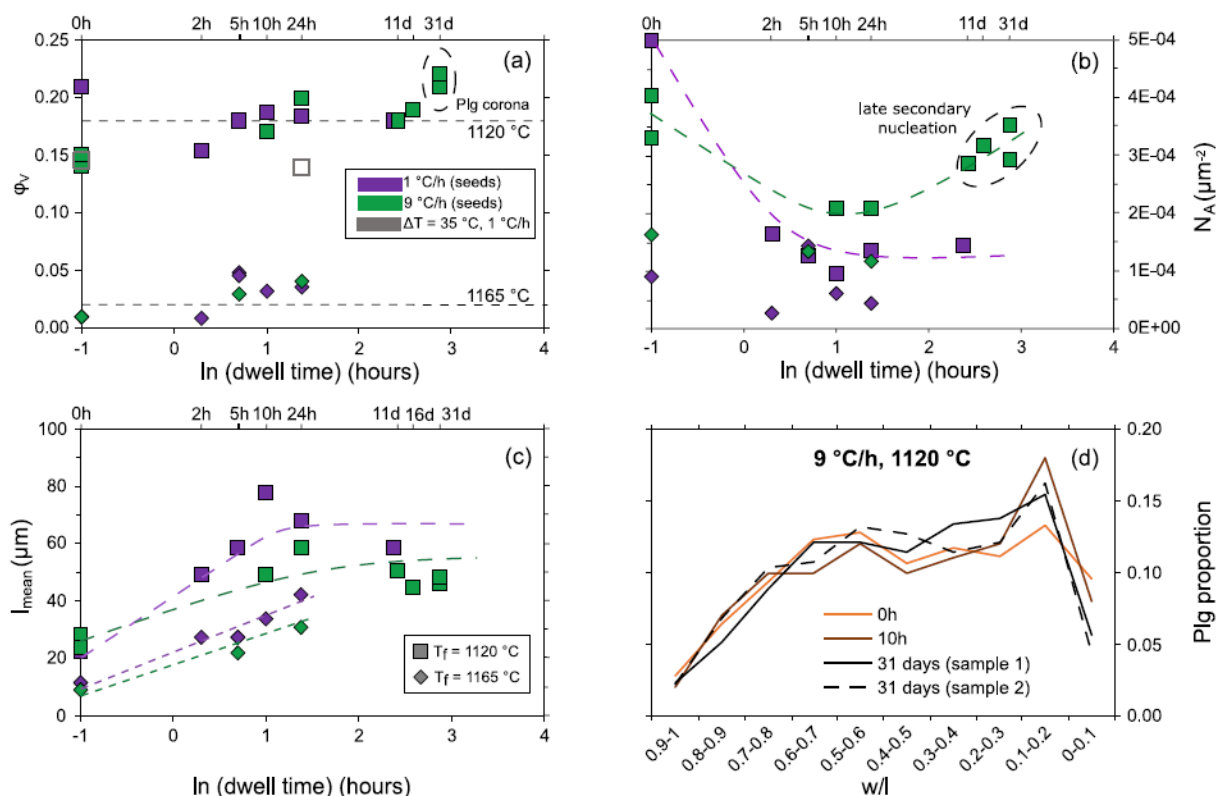
CSD DATA

The CSDs obtained for these experiments (**Fig. 8**) show a decrease in both slope and intercept (Supplementary file 4), supporting a reduced nucleation and growth with increasing dwell time. After 11 days at 1120 °C, the intercept increased again (**Fig. 8b**), consistent with the observed second

nucleation event. CSDs from 2 and 5 h runs are similar, whereas the 24 h experiment at 1165 °C shows upward curvature, likely due to low crystal counts.

SUMMARY OF KEY RESULTS

Before moving onto the interpretation of our experimental results, we provide here a short summary of our key observations. Preferential nucleation occurred near the Pt wire at the onset of crystallization and in superheated runs, whereas seeded cooling experiments also exhibited significant nucleation within the interior of the charge. Isothermal experiments produced abundant, uniformly sized small crystals, particularly when crystal-free glass (OS36*) was used as the starting material (**Fig. 9**). Cooling experiments showed greater crystal size variability indicative of continuous nucleation, accompanied by a progressive transition from euhedral to skeletal and dendritic habits with increasing cooling rate. Increasing initial superheating in cooling experiments promoted the growth of fewer but larger dendritic crystals (**Fig. 9**), opposite to the trend observed in isothermal experiments. Experiments held at their final temperature reached near-equilibrium crystal proportions after 2–5 h, while crystal habits remained unchanged even after durations of up to 31 days.



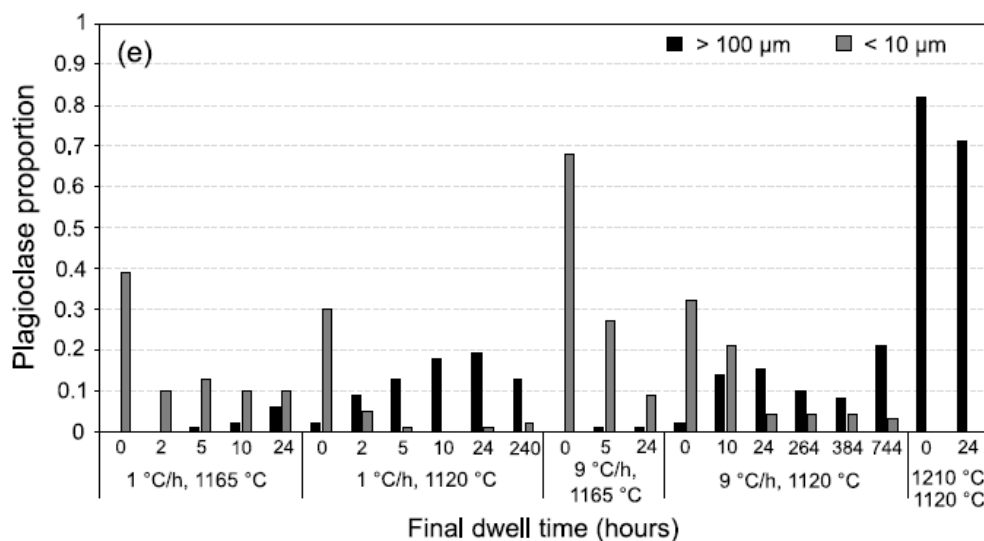


Fig. 7 Microstructural data from cooling experiments followed by a final isothermal dwell (relaxation) time. **a–c** Plagioclase volume proportion (ϕ_v), number density (N_A), and mean crystal size (l_{mean}) vs. final dwell duration. **d** Proportion of plagioclase crystals vs. their 2D aspect ratio (w/l) for the different relaxation times at 1120 °C following cooling at 9 °C/h. **e** Evolution of the abundance of the largest (> 100 μm) and smallest (< 10 μm) plagioclase crystals with final dwell time under various experimental conditions

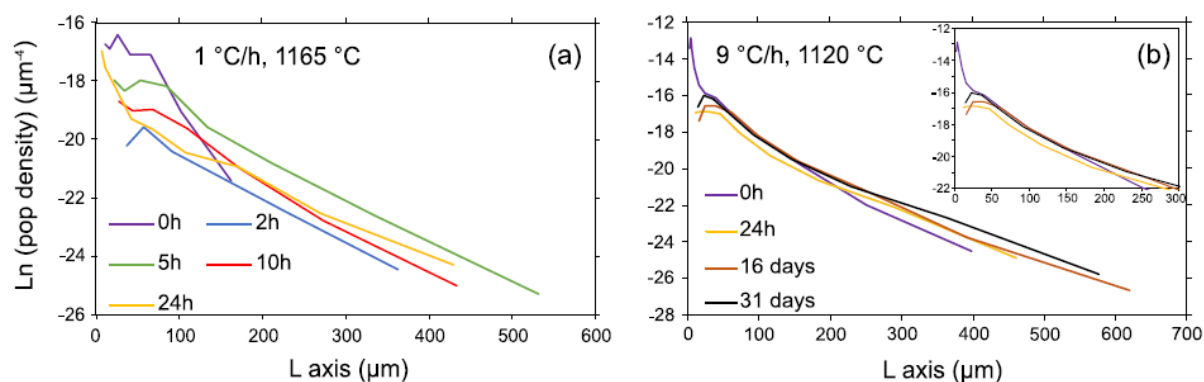


Fig. 8 3D plagioclase crystal size distributions (CSDs) after various relaxation durations ranging from 0 h (i.e., immediately after the cooling step) to 31 days. The inset plot in b corresponds to a zoom on the first part of the CSD

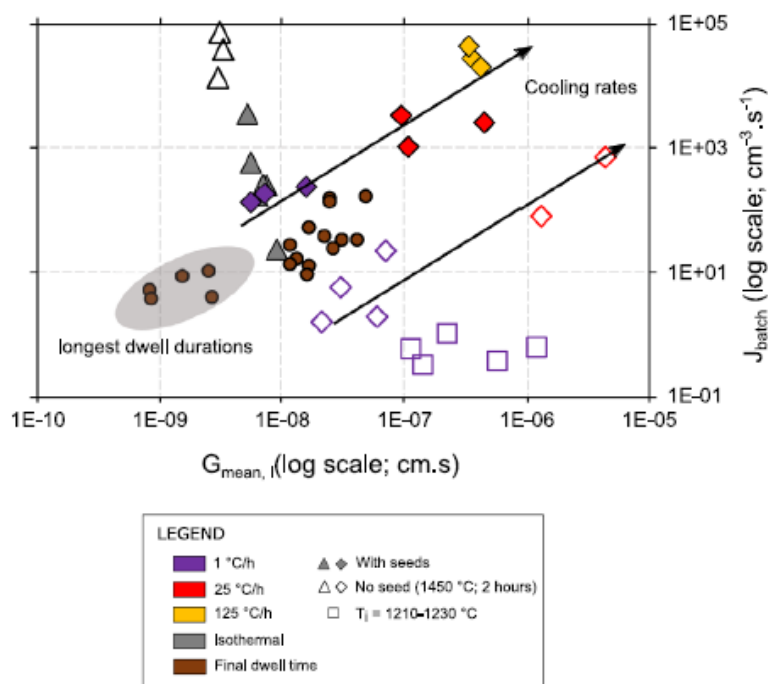


Fig. 9 J vs. G diagram illustrating the competition between nucleation and growth during the various explored solidification paths. Note that values referring to final dwell durations do not represent incremental data, but the entire experimental duration

Discussion

THE IMPACT OF THERMAL HISTORY ON THE EXPERIMENTAL LIQUIDUS

The effective liquidus temperature was constrained to 1175 °C by Billon et al. (2025) using isothermal experiments. However, the temperature at which crystallization begins is sensitive to both the degree of superheating and the cooling rate. In superheated runs, nucleation was delayed, as previously noted by Walker (1978): from $\Delta T = 35$ °C, plagioclase only began crystallizing at ~ 1145 °C, i.e., 30 °C below the liquidus. This shift may reflect not only the effect of cooling rate but also the intrinsically inefficient and stochastic nature of nucleation near the liquidus. Because nucleation near the liquidus may involve a significant incubation time representing an absolute timescale, a pronounced nucleation delay can offset the influence of cooling rate and shift the apparent onset of nucleation to temperatures well below the liquidus. This effect is amplified at high cooling rates, as the system rapidly traverses the near-liquidus interval and reaches much lower temperatures before nucleation can initiate. This depression of the nucleation onset is confirmed by the similar crystal abundances obtained at 1100 °C in samples preheated at either 1210 or 1230 °C. Crystal-free glasses (OS36*) also showed this effect at high cooling rates (25–125 °C/h), with crystallization completely suppressed at 125 °C/h in our runs. These results are consistent with Donaldson (1979) and define a critical cooling rate (R_c) above which no crystals nucleate (Fan et al. 2007), permitting the system to attain the glass transition temperature with no nucleation (Fokin et al. 2003, 2006; Iezzi et al. 2008, 2011). Our R_c (between 25 and 125 °C/h)

in a melt containing 56.50 wt.% SiO₂ is comparable to that of latitic melts (60 °C/h) with similar silica contents (57.72 wt.% SiO₂; Iezzi et al. 2011). Small variations in melt composition or initial crystal content can increase R_c by over an order of magnitude ($R_c > 125$ °C/h in seed-bearing runs).

The observed changes in the effective liquidus affect the calculation of nucleation (J) and growth (G) rates. As mentioned by Rusiecka et al. (2020), durations are often measured from the start of experiments (Swanson 1977), which remains valid for superheated cooling runs in which nucleation occurs in a crystal-free melt. However, only a few studies, such as those of Sirbescu et al. (2017) and Auxerre et al. (2022), consider the potential for delayed nucleation due to modifications of the thermal history. Experiments involving the presence of crystal seeds, for example, tend to promote primary growth above the effective liquidus in similar but unseeded runs, implying different onset times for nucleation and growth. For moderate cooling rates (1–9 °C/h), this shift has only a minor effect on G : accounting for the onset of growth at 1190 °C instead of 1175 °C increases growth rates by a factor of 1.1–2.5 (Billon et al. 2025), which is minor given their magnitude (10^{-7} – 10^{-8} cm/s). However, at faster cooling rates (25 °C/h), growth and nucleation rates may be underestimated by up to one order of magnitude if the depression of the effective liquidus is not taken into account; growth rates can increase by a factor of 2–7, and nucleation rates by a factor of 3–15.

EVOLUTION OF NUCLEATION AND GROWTH RATES DURING COOLING AND ISOTHERMAL EXPERIMENTS

THE EFFECT OF COOLING RATE ON GROWTH AND NUCLEATION

The concept of textural equilibrium describes the microstructure for which the internal energies are at a minimum (Higgins 2011). For isolated crystals in a liquid, this entails the crystals attaining their equilibrium Wulff shape, for which the energy of the interfaces is minimized (Herring 1951; Fonseca 1991). Although the Wulff shape for plagioclase in silicate liquids is not known, textural equilibration must involve a decrease of the surface area-to-volume ratio (First et al. 2020); compact, inclusion-free polyhedral crystals are therefore closer to equilibrium than skeletal or dendritic forms. In crystal populations spanning a range of sizes, textural equilibration may also involve coarsening, whereby smaller crystals owing to their higher surface area-to-volume ratios are preferentially consumed in favour of larger crystals (Higgins 2011). Regardless of the degree of initial superheating or undercooling, rapid cooling drives phase compositions and crystal habit progressively away from both chemical and textural equilibrium (Conte et al. 2006; Mollo et al. 2012).

In our seeded experiments, the transition from euhedral to skeletal/dendritic habits occurred when cooling exceeds 9 °C/h: the appearance of skeletal plagioclase at 1120 °C indicates a shift from interface-controlled to diffusion-limited growth. This change in control of the growth habit is further evidenced by the observation of diffuse compositional boundary layers in experiments cooled at 125 °C/h, and a sharp increase in growth rates at 25–125 °C/h (Supplementary file 3: **Table S2**). According to Watson and Müller (2009), the compositional boundary layer observed at 9 and 25 °C/h reflects the low viscosity and high cation diffusivity of the melt. The transient skeletal habits observed at 1120 °C when cooling at 9 °C/h may therefore reflect an intermediate growth regime (Mangler et al. 2023) characterized by rapid transitions between rate-controlling processes. A similar trend was observed in

initially crystal-free runs (OS36*), though over a narrower range of cooling rates, with skeletal habits observed at 1 °C/h and dendritic ones at 25 °C/h.

Despite the high cooling rates explored here (25–125 °C/h), the $\log(G)$ and $\log(J)$ vs. $\log(t)$ relationships obtained in this study (Fig. 10a and b; Supplementary file 3: Table S3) are consistent with those reported by Billon et al. (2025), whose data are not shown in the figure. The slope and intercept values differ by only $\sim 10\%$ for growth and $< 5\%$ for nucleation. Crystal number density (N_A) peaks at 9 °C/h, then decreases with increasing cooling rate, likely due to liquidus depression caused by the large degree of effective undercooling ($-\Delta T_n$). After correcting for this effect, nucleation rates increase from 10^2 to $10^4 \text{ cm}^{-3} \text{ s}^{-1}$ with increasing cooling rate (Fig. 4d).

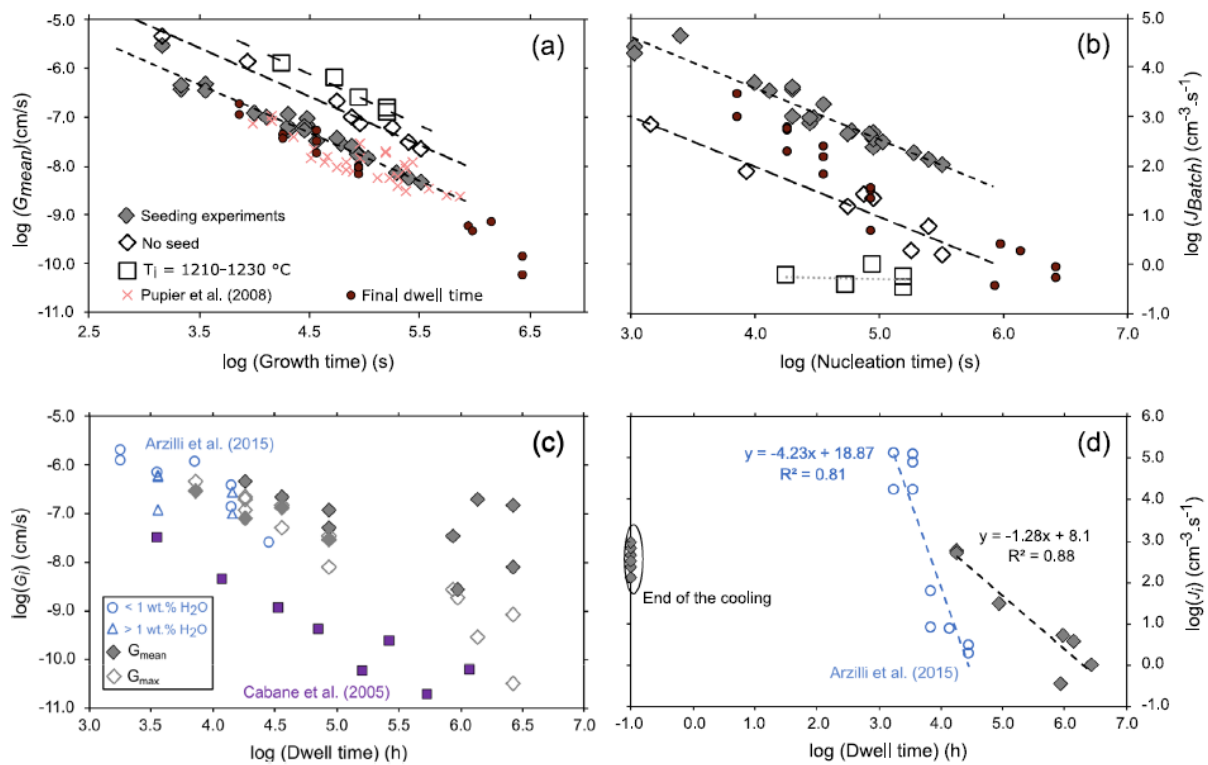


Fig. 10 Evolution of **a, c** $\log(G)$ and **b, d** $\log(J)$ as functions of **a** growth and **b** nucleation time and **c, d** dwell time. The various coefficients associated with each equation are reported in Supplementary File 3 (Fig. S3). Circles and triangles in (c) represent hydrated experiments containing less than and more than 1 wt.% H_2O , respectively

COMPARISON WITH ISOTHERMAL EXPERIMENTS

Regardless of the initial thermal pre-treatment, the low mean growth rates in experiments conducted at $-\Delta T_n = 5-25 \text{ }^\circ\text{C}$ ($3.02-5.74 \times 10^{-9} \text{ cm/s}$) contrast with those in cooling experiments, in which increased degrees of undercooling enhanced the growth rate from $2.96 \times 10^{-8} \text{ cm/s}$ at 1 °C/h to $2.93 \times 10^{-6} \text{ cm/s}$ at 125 °C/h, particularly in seeded runs.

According to CNT, near-liquidus nucleation should be minimal. Yet, with or without initial superheating to 1450 °C, our isothermal runs systematically display the highest crystal number densities (5.45×10^{-4} to $1.43 \times 10^{-2} \text{ } \mu\text{m}^{-2}$), up to two orders of magnitude higher than those during cooling experiments, even at high $-\Delta T_n$ values (Supplementary file 3: Table S1). Because seeds of plagioclase were not abundant ($< 1\%$), or were even absent, heterogeneous nucleation cannot account for these high

values. Experiments on initially crystal-free glass showed a sudden proliferation of similarly shaped crystals around 1170 °C, along with a diffuse compositional boundary layer indicative of diffusion-limited growth.

The strong correlation between high crystal densities and elevated porosity (Supplementary file 3: **Table S1**) suggests that bubbles act as preferential nucleation sites (Davis and Ihinger 1998). Although high viscosity likely inhibits bubble formation, the initial thermal treatment plays a key role. In cooling experiments, extending heating at 1190 °C may have promoted volatile incorporation (e.g., CO₂) and subsequent bubble dissolution. Du et al. (2003) showed that small particles can stabilize emulsions by adhering to interfaces. By analogy, though hypothetical in silicate melts, growing microcrystals might locally stabilize gas bubbles. For example, Dickinson et al. (2004) showed that air bubbles larger than ~ 80 µm stabilized by silica nanoparticles remain indefinitely; a similar process may explain the rare but large bubbles formed in our cooling experiments.

IMPACT OF THE FINAL DWELL TIME

The impact of dwell time on crystallization kinetics has been addressed in only a few studies, mainly those focused on relaxation following isothermal crystallization (Cabane et al. 2001, 2005) or after extremely rapid cooling/decompression events (> 1000 °C/h; Arzilli et al. 2015; Pontesilli et al. 2019). In our experiments, initial cooling at 1 and 9 °C/h led to a stable modal proportion, with nucleation and growth predominantly occurring during the first two hours of the dwell time, consistent with Arzilli et al. (2015). Incremental rates dropped sharply, growth rates from 10⁻⁷–10⁻⁸ to 10⁻¹⁰–10⁻¹¹ cm/s and nucleation rates from 10³ to 10¹–10⁻¹ cm⁻³ s⁻¹, with increasing dwell time (**Fig. 10**, Supplementary File 3: **Table S2**), matching trends from both dry and hydrous isothermal studies (Cabane et al. 2005; Pontesilli et al. 2019). Additional experiments with short dwell times (< 2 h) should be performed to test whether chemical equilibrium is reached immediately post-cooling. Despite rapid modal equilibration, plagioclase grains retained high surface area to volume ratios even after 31 days, with features like hopper cavities (**Fig. 10**; Arzilli et al. 2015), contrasting with the more rounded and compact pyroxenes of Pontesilli et al. (2019).

As mentioned by Cabane et al. (2005) and Higgins (2011), coarsening depends on the mineral (e.g. quartz, olivine, pyroxene, plagioclase). Our results suggest that plagioclase grains require much longer to achieve a low energy shape than does pyroxene or olivine which coarser much more rapidly.

To isolate the effect of the final dwell time, we performed regressions of log(*J_i*) and log(*G_i*) versus log(*t_{dwell}*) (**Fig. 10c, d**; **Table 1**):

$$\log(J_{Batch}) = -1.28 \times \log(t_{dwell}) + 8.1; R^2 = 0.88 \quad (3)$$

$$\log(G_{mean}) = -1.14(\pm 0.07) \times \log(t_{dwell}) - 2.42(\pm 0.30); R^2 = 0.93 \quad (4)$$

$$\log(G_{max}) = -1.21(\pm 0.11) \times \log(t_{dwell}) - 1.67(\pm 0.49); R^2 = 0.83 \quad (5)$$

The 1σ errors reflect the inclusion or exclusion of long dwell durations (> 10 days), in which further nucleation might occur. Compared to cooling experiments, nucleation and growth rates considering dwell time differ only modestly (by 23% for nucleation and 14–15% for growth). The observed decrease in growth rate aligns with isothermal and isobaric trends reported by Cabane et al. (2005) and Arzilli et al. (2015), whereas the decrease in nucleation rate is less steep (slope – 1.28 vs. – 4.23 in Arzilli et

al. 2015). Growth rate trends for various minerals (plagioclase, pyroxene, olivine) are similar, with slopes around -1.12 ± 0.14 (**Table 1**). Only 6 of 18 runs held at the final temperature yielded usable J values, due to N_V decreasing with increasing dwell time, producing negative J values. Applying the standard J_{Batch} equation is not appropriate here, as it neglects the two-step (cooling + dwell) experimental design.

The sharp decrease in nucleation rate and the reduced abundance of small crystals ($< 10 \mu\text{m}$; **Fig. 7e**; **Table 1**; Supplementary file 3: **Table S2** and **S4**) suggest post-nucleation processes associated with textural coarsening (Cabane et al. 2005; Higgins 2011), consistent with the downturn of the CSD curve at the smallest sizes (**Fig. 8**). Coarsening promotes dissolution of the smallest crystals, growth of large, equant crystals, and the gradual removal of disequilibrium textures, thereby reducing the overall internal energy of the crystal population during the dwell period. While in our experiments coarsening primarily affected the smallest crystals, studies such as Mills and Glazner (2013) and Da Silva et al. (2017) showed that repeated temperature cycling, as occurs during magma injections, can increase average crystal size and dissolution rates, producing glomerocrystic textures.

THE IMPACT OF SUPERHEATING AND INITIAL MATERIAL ON NUCLEATION AND GROWTH RATES

The initial temperature relative to the liquidus strongly influences crystal number density during cooling (Supplementary file 3: **Table S1**). Compositions OS36 and OS36* (pre-heated at 1450°C) differed only in the presence of visible pre-existing plagioclase fragments in OS36 (3.58×10^{-6} to $2.23 \times 10^{-5} \mu\text{m}^{-2}$, i.e., $< 1\%$ of total crystals). The presence of seeds significantly enhanced N_A by 1–2 orders of magnitude, even at such low abundances, highlighting the strong control of initial material on nucleation as previously reported for olivine (Lofgren 1989; Anwar et al. 2015; Auxerre et al. 2022). Dowty (1980) attributed this to cavitation, where adding a single seed induces abundant nucleation through local undercooling enhanced by mechanical agitation or shock waves.

The effect of superheating was assessed by comparing experiments initially maintained at 1190°C (using OS36*) and 1210°C ($+\Delta T = 35^\circ\text{C}$). At the onset of crystallization, no pre-existing fragments were present (completely dissolved), and the N_A ratio was very low ($1.88 \times 10^{+1}$), confirming that high superheating followed by low undercooling is thermodynamically unfavorable for nucleation (Arzilli et al. 2015). As crystallization progressed, faster nucleation in runs initially held only 15°C above the saturation temperature of plagioclase increased the ratio to 4.07. In comparison, sustained nucleation in runs containing plagioclase fragments (OS36) increased the ratio to $6.95 \times 10^{+1}$ in runs without an intermediate isothermal step ($+\Delta T = 35\text{--}55^\circ\text{C}$), and to $1.71 \times 10^{+1}$ in runs with such a step ($+\Delta T = 15^\circ\text{C}$; OS36*).

Nucleation and growth rates were similar for all experiments initially held $35\text{--}55^\circ\text{C}$ above the liquidus, and were respectively 1–2 orders of magnitude lower (J) and higher (G) than in seed-bearing runs (**Fig. 7**; Supplementary file 3: **Table S2**). Including an intermediate isothermal step 15°C above the liquidus reduced this difference to approximately one order of magnitude. Interestingly, in isothermal runs, this trend was reversed: nucleation rates were 1–2 orders of magnitude higher in unseeded runs. This opposite trend may reflect an episode of overgrowth favored in isothermal runs conducted with OS36, explaining both the rounded crystal shapes and the reduced nucleation. Combined with insufficient

elemental supersaturation or an overly short dwell time, plagioclase crystals may thus display anhedral morphologies.

The $\log(J)$ – $\log(t)$ and $\log(G)$ – $\log(t)$ trends follow linear regressions with R^2 between 0.90 and 0.98 (**Fig. 10a, b**; Supplementary file 3: **Table S3**), with similar slopes (-1.03 ± 0.01 for J and -1.01 ± 0.03 for G), reflecting consistent time dependence (Grove 1978; Kohut and Nielsen 2004; Billon et al. 2025). These trends are comparable across the various experimental series, regardless of the initial degree of superheating or the presence of initial crystal fragments. Nonetheless, the intercepts are higher for G and lower for J in strongly superheated runs, suggesting that superheating enhances skeletal/dendritic growth while inhibiting nucleation. Nucleation appears strongly controlled by the initial material, with higher J intercepts in seed-bearing runs, even when cooling in highly superheated runs was preceded by a moderate superheating step. The $\log(J)$ – $\log(t)$ regression was poor for highly superheated runs ($+\Delta T = 35$ – 55 °C) due to low nucleation and limited data (only 3–34 crystals).

The $\log(G)$ – $\log(t)$ trends align with growth rate measurements from Pupier et al. (2008), who used synthetic crystal-free material and low degrees of superheating ($+5$ – 15 °C). However, their intercept (-4.11) is 41% lower than in our seeded runs (and 105% lower compared to our runs using OS36*), while their crystal shapes more closely resemble those in our seeded experiments.

FACTORS IMPACTING THE NUCLEATION PROCESS

THE ROLE OF THE SUBSTRATE

Although the starting temperature of the experiment exerts a fundamental control on nucleation, other parameters such as the initial liquid composition (Iezzi et al. 2008; Vetere et al. 2013) and the nature of substrates also influence nucleation. Heterogeneous nucleation has long been used in ceramic systems (Norton 1937; Höland et al. 2003; Deubener and Höland 2017) and is often used to trigger solidification near the liquidus (Berkebile and Dowty 1982). In the case of our initially highly superheated cooling runs (**Fig. 1c**), most nucleation occurred at the sample edges and on the Pt wire (Supplementary file 1: **Fig. S4a** and **d**), especially at low effective degrees of undercooling in seed-bearing runs ($-\Delta T_n = 15$ °C; see Dowty 1980; Lofgren and Smith 1980; Pupier et al. 2008). In contrast, Iezzi et al. (2008) and Mollo et al. (2012) did not report such effects at Pt substrates in their experiments. Mollo et al. (2012) attributed this to the use of a differentiated trachytic melt with low cation diffusivity, delaying nucleation. They also explained that the high oxidation temperature (~ 1300 °C) limited iron diffusion from the melt to the Pt substrate, preventing the formation of iron-rich particles to act as preferential nucleation sites for clinopyroxene. Although the Pt wire promotes early nucleation at low degrees of undercooling, it represents only a small fraction of the area examined ($4 \pm 2\%$) and cannot explain the overall high crystal abundances observed (Supplementary file 1: **Fig. S4c**). However, when coupled with a heterogeneous distribution of nucleation sites within the melt (Billon et al. 2025), this could explain the lower experimental reproducibility observed at the onset of crystallization (**G 2-1a** and **b**, cooled at 3 °C/h and quenched at 1165 °C in Billon et al. 2025).

Substrate crystal structure is also known to affect nucleation. Mollo et al. (2012) found that nucleation was promoted for phases structurally similar to the seed mineral. Holness et al. (2023) argued that heterogeneous nucleation on a substrate of the same phase is thermodynamically disfavored, and that

continuous growth is more likely. This aligns with our observations of plagioclase overgrowths around anorthite seeds (**Figs. 2c, 3c**; Supplementary file 1: **S4b**) and the dendritic nucleation of oxides and pyroxene on plagioclases at 1050–1000 °C (**Fig. 3e**; Supplementary file 1: **S4f**).

THE EFFECT OF THERMAL HISTORY ON NUCLEATION

Crystal number density and delayed nucleation depend on the critical radius (r^*), which must be exceeded for growth ($> 1 \mu\text{m}$; Davis 2001). According to Donaldson (1979) and Kirkpatrick (1981) at, or slightly below, the liquidus r^* is large, inhibiting nucleation. At lower temperatures, r^* decreases, allowing significant nucleation with high N_A . This consideration of homogeneous nucleation contrasts with our experimental results, which show significant nucleation beginning at $-\Delta T_n = 5\text{--}15 \text{ }^\circ\text{C}$, depending on the experimental path (cooling vs. isothermal). As noted by Billon et al. (2025), in seed-bearing runs cooled at $1\text{--}9 \text{ }^\circ\text{C/h}$, the maximum nucleation rate occurs early during crystallization ($-\Delta T_n \approx 15 \text{ }^\circ\text{C}$); this may be explained by several factors, including initial long relaxation times, slow cooling rates, or heterogeneous nucleation.

Donaldson (1979) suggested that higher cooling rates promote increased nucleation but at lower temperatures (Walker et al. 1976). The J_{Batch} vs. temperature plot (Supplementary File 3) reveals a clear shift in the temperature at which the maximum nucleation rate occurs, from $1165 \text{ }^\circ\text{C}$ at $1 \text{ }^\circ\text{C/h}$ to 1140 and $1100 \text{ }^\circ\text{C}$ at 9 and $25 \text{ }^\circ\text{C/h}$, respectively. At $125 \text{ }^\circ\text{C/h}$, nucleation occurred even later ($1100 \text{ }^\circ\text{C}$) and increased until $1050 \text{ }^\circ\text{C}$ (**Fig. 4d**). A similar trend is also observed in fully molten samples (OS36*).

Other parameters such as the initial material composition (natural, synthetic, or fully molten) or the degree of superheating can indirectly affect r^* , dissolving potential nucleation sites (crystal seeds, glass fragments). Accordingly, an important outstanding question is: can nucleation truly be homogeneous, or does it mainly rely on heterogeneous nucleation on sites such micro-crystal fragments, pre-existing oxide particles, or bubble surfaces?

NUCLEATION STYLE RELATED TO THE INITIAL THERMAL TREATMENT

The use of seeds as sites for the nucleation of new crystals is common (Mollo et al. 2012; Anwar et al. 2015), sometimes referred to as “self-nucleation” for the growth of a similar crystalline structure around a seed (purple areas in **Fig. 3c**; **Fig. S** in Supplementary file 1; Shea and Hammer 2013; Holness et al. 2023; Billon et al. 2025). An example of true heterogeneous nucleation is plagioclase nucleation on the surface of gas bubbles (Supplementary file 1: **Fig. S4e**), and the nucleation of clinopyroxene and Fe-Ti oxides on a plagioclase substrate (**Fig. 3d** and **e**). In turn, newly formed crystals can themselves act as seeds, enabling further nucleation through various mechanisms, such as crystal motion, or inter-crystal contact (Dowty 1980; Cui and Myerson 2014; Anwar et al. 2015).

Studies using fully molten samples (Lofgren 1974; Donaldson 1979) interpreted the resulting microstructures as a product of internal homogeneous nucleation. However, the dendritic and skeletal plagioclase crystals in our unseeded cooling runs tended to appear first along the sample edges (**Fig. 3d** and Supplementary file 1: **Fig. S4d**; Berkebile and Dowty 1982). This, together with the limited increase in crystal number density (N_A), the absence of small crystals ($\leq 10 \mu\text{m}$), and the apparent consistency of crystal shape in initially highly superheated runs point to the occurrence of a single heterogeneous nucleation event. This behavior contrasts the continuous nucleation observed in

seeded experiments, which are characterized by broad ranges of crystal sizes and shapes (**Figs. 2c, d, 3a–c**). Secondary nucleation, due perhaps to the formation of semi-ordered clusters at the interface of pre-existing crystals, or to micro-attrition processes (e.g., mechanical breakage or collision between crystals larger than 10 μm ; Cui and Myerson 2014), may account for the observed continuous character of nucleation at high degrees of effective undercooling ($-\Delta T_n = 10\text{--}125\text{ }^\circ\text{C}$).

Although we cannot exclude the process of internal homogeneous nucleation in cooling or isothermal experiments using either seeded or crystal-free materials, super-liquidus survival of nanometric/micrometric residual substrates (crushing impurities, nanometric clusters, or gas bubbles) is sufficient to promote nucleation (Lofgren et al. 1978; Berkebille and Dowty 1982; Davis and Ihinger 1998), with perhaps $10^5\text{--}10^6$ potential heterogeneities per centimeter that are too small to observe ($< 0.1\text{ }\mu\text{m}$ in size; Turnbull 1956, 1969). The presence of such nanometric/ micrometric nucleation sites could therefore explain the continuous nucleation observed when a sub-liquidus isothermal step is added, even in initially crystal-free systems. A similar mechanism may account for the euhedral olivine shapes reported by Pupier et al. (2008), despite their use of a nominally crystal-free synthetic material. Such synthetic compositions are often prepared from mixed oxide powders, which can contain potential nucleation sites and may explain the differences compared to our experiments using fully molten natural glass. Finally, when nucleation sites are homogeneously distributed throughout the melt, heterogeneous nucleation can become indistinguishable from truly homogeneous nucleation, as observed in our rapidly cooled seeded experiments (e.g., $125\text{ }^\circ\text{C/h}$; $T_f = 1100\text{ }^\circ\text{C}$).

This ambiguity between homogeneous and heterogeneous nucleation is also supported by the empirical relationship proposed by Toramaru and Kichise (2023) and Toramaru (2025), linking crystal number density (N_A) to cooling or decompression rate as a function of the abundance of heterogeneous nucleation sites:

$$\log(N_A) = \xi \times \frac{dT}{dt} \quad (6)$$

where ξ reflects the nucleation type and is assigned values of $3/2$ or -1 for purely homogeneous or heterogeneous nucleation, respectively. In our seeded experiments, ξ values ranged from 0.2 ($1\text{--}9\text{ }^\circ\text{C/h}$) to -0.4 ($9\text{--}125\text{ }^\circ\text{C/h}$), whereas those in initially crystal-free runs varied from 0.48 to -0.55 . These values are consistent with those reported by Toramaru and Kichise (2023), indicating a mixed regime combining both homogeneous and heterogeneous nucleation, with the relative contribution of each depending on undercooling intensity and substrate availability.

NUCLEATION MECHANISM LINK TO THE SUPERHEATING EFFECT

Although the degree and duration of superheating (First et al. 2020) impact the style and efficiency of nucleation, questions remain regarding the underlying mechanism. It may result either from incomplete structural rearrangement of the melt or from the removal of nanometric particles or bubbles. Some studies tend to support the second hypothesis (Dingwell 2006; Vetere et al. 2013), suggesting that structural reorganization occurs almost instantaneously at high temperatures.

We used the Maxwell relation (Vetere et al. 2013) to constrain the timescale of structural relaxation (τ) of the silicate melt in our experiments:

$$\tau = \frac{\eta}{S_h} \quad (7)$$

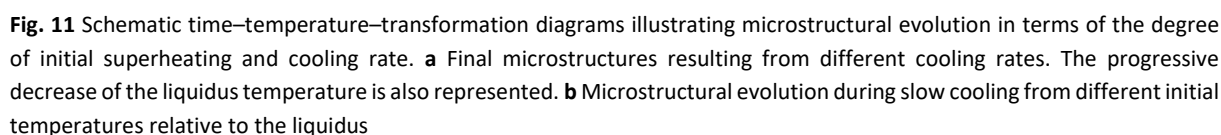
with η being the melt viscosity (Pa s) calculated at 1190, 1200, and 1450 °C, and S_h the shear modulus (~ 10 GPa; Richet 2002; Webb 2005; Vetere et al. 2013). τ reflects the equilibration timescale for slow-diffusing Si cations. At 1190 °C, τ ranges from 10^{-3} to 10^{-4} min, increasing to ~ 30 min at 1000 °C ($\eta \approx 10^7$ Pa s). These values are consistent with the results of Vetere et al. (2013) (10^{-6} – 10^{-9} min at 1300 °C for basaltic and rhyolitic melts) and remain negligible during our 24-h isothermal experiments. Thus, structural relaxation in silicate melts is effectively instantaneous over the experimental durations at super-liquidus temperatures and is largely independent of the crystallization path. This agrees with our observations that superheating to 1210–1230 °C (+ $\Delta T = 35$ –55 °C) yields similar nucleation behavior. Tsuchiyama (1983) noted that when superheating exceeds 40 °C for more than 45 min, the magnitude of superheating has a comparable effect on nucleation.

The second hypothesis related to the timescale and minimum length required for melt re-homogenization (i.e., the suppression of microscopic gas bubbles, chemical inhomogeneities, or soluble surface impurities) was tested by calculating the diffusion length, x , (Vetere et al. 2013) of the main cations (Al, Ca, Mg, and Si) as:

$$x = \sqrt{(2D \times t)} \quad (8)$$

where D corresponds to the cation's diffusivity, and t is the experimental duration (5–168 h). Cation diffusivities were estimated using the Eyring relation (D_i ; Chakraborty 1995) for Si and empirical Eqs. (35), (25), and (22) from Zhang et al. (2010) for Al, Ca, and Mg, respectively (see Supplementary File 3: **Tables S6** and **S7**). The resulting diffusion lengths (277 μm at 1200 °C to 58 μm at 1000 °C) suggest that only impurities larger than ~ 280 μm may persist after prolonged superliquidus heating. This explains the variable seed number density observed in our experiments, which was consistently far less than 1% of the total crystallinity. Importantly, this process concerns only soluble particles (Vetere et al. 2013). As observed by Berkebile and Dowty (1982), the absence of internal nucleation in runs heated to 15 °C above the liquidus, but without a sub-liquidus isothermal step, supports two conclusions: (i) internal nucleation is likely controlled by residual soluble particles (e.g., nanometric gas bubbles, local chemical inhomogeneities, or contaminants introduced by the experimental setup); and (ii) maintaining the temperature close to the liquidus (here a + $\Delta T = 15$ °C) is required to regenerate such particles.

However, due to the size range involved and the absence of nanoscale observations, it remains impossible to distinguish conclusively between truly homogeneous nucleation and heterogeneous nucleation initiated by submicroscopic impurities or gas bubbles distributed homogeneously throughout the melt (Davis and Ihinger 1998).



Rock microstructure result from a complex interplay between phase assemblage and crystal shape, size, number density, and spatial distribution. Among these, nucleation plays a key role in controlling the final number of crystals. Our experiments demonstrate that thermal history, especially the degree of initial superheating and the cooling or decompression rate, strongly influences the timing and efficiency of nucleation. A modest initial degree of superheating of just 35 °C is sufficient to significantly suppress nucleation (**Fig. 11b**), reducing crystal number densities by as much as two orders of magnitude. In comparison, achieving a similar effect through cooling alone would require a 100-fold increase of the cooling rate, highlighting the dominant control of superheating on nucleation behavior.

Crystal growth mechanism correlate strongly with the nucleation regime. At low degrees of undercooling, large and euhedral phenocrysts form, whereas greater degrees of undercooling, often caused by prior superheating or rapid cooling, favor the development of numerous skeletal or dendritic microlites, whose size is limited by the available space within the residual melt (**Fig. 11a**). At such high degrees of undercooling, fast growth produces disequilibrium features such as complex twinning. As

noted by Cabane et al. (2005), Ostwald ripening in plagioclase is sluggish, and likely ineffective on short timescales, explaining the absence of euhedral shapes.

The spatial distribution of crystals also reflects the type of nucleation and thermal path. In strongly superheated runs, nucleation is not only delayed, but is often restricted to a few sites permitting heterogeneous nucleation such as on the Pt wire or sample edges (**Fig. 11b**). In the most extreme cases, nucleation is nearly suppressed or limited to a single event. Although true homogeneous nucleation remains rare due to the existence of microscopic substrates in the melt, intermediate conditions may cause continuous mixed nucleation with both internal and edge-related events, especially early during crystallization.

These experimental insights have important implications for natural systems: phenocrysts likely reflect sub-liquidus crystallization with limited nucleation, whereas microlite-rich textures suggest moderate superheating and more efficient nucleation. As shown in our isothermal experiments, gas bubbles, particularly during decompression, can act as effective nucleation sites, promoting the formation of abundant, small plagioclase laths as magma rises prior to eruption.

Supplementary Information File 1

BSE IMAGES

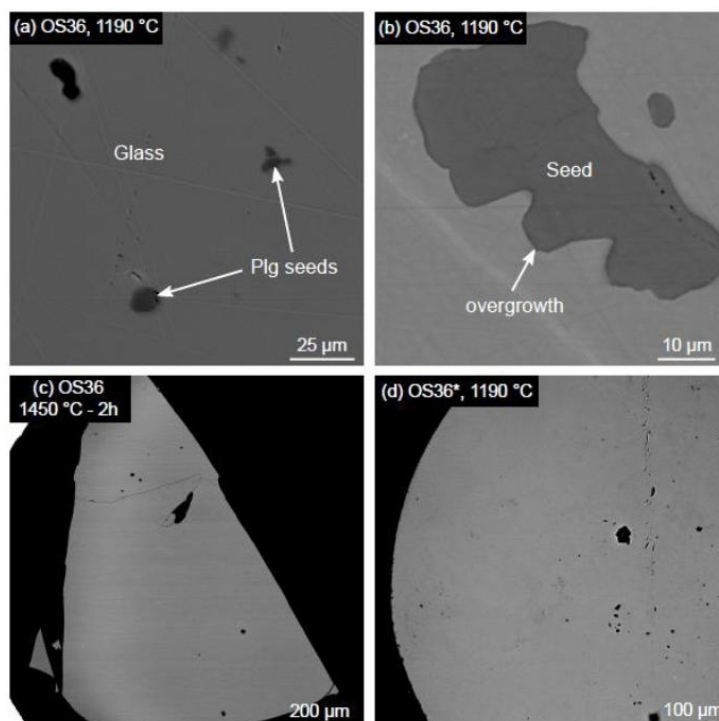


Fig. S1: **a, b** Plagioclase seeds observed after heating the OS36 starting material to 1190 °C for 24h. A possible early overgrowth around the seed is visible in panel **(b)**. **c** Glassy material obtained after heating the OS36 starting material to 1450 °C for 2 h to produce the OS36* starting material, with no crystal fragments visible. **d** Glassy material obtained after heating the OS36* material to 1190 °C for 2 h.

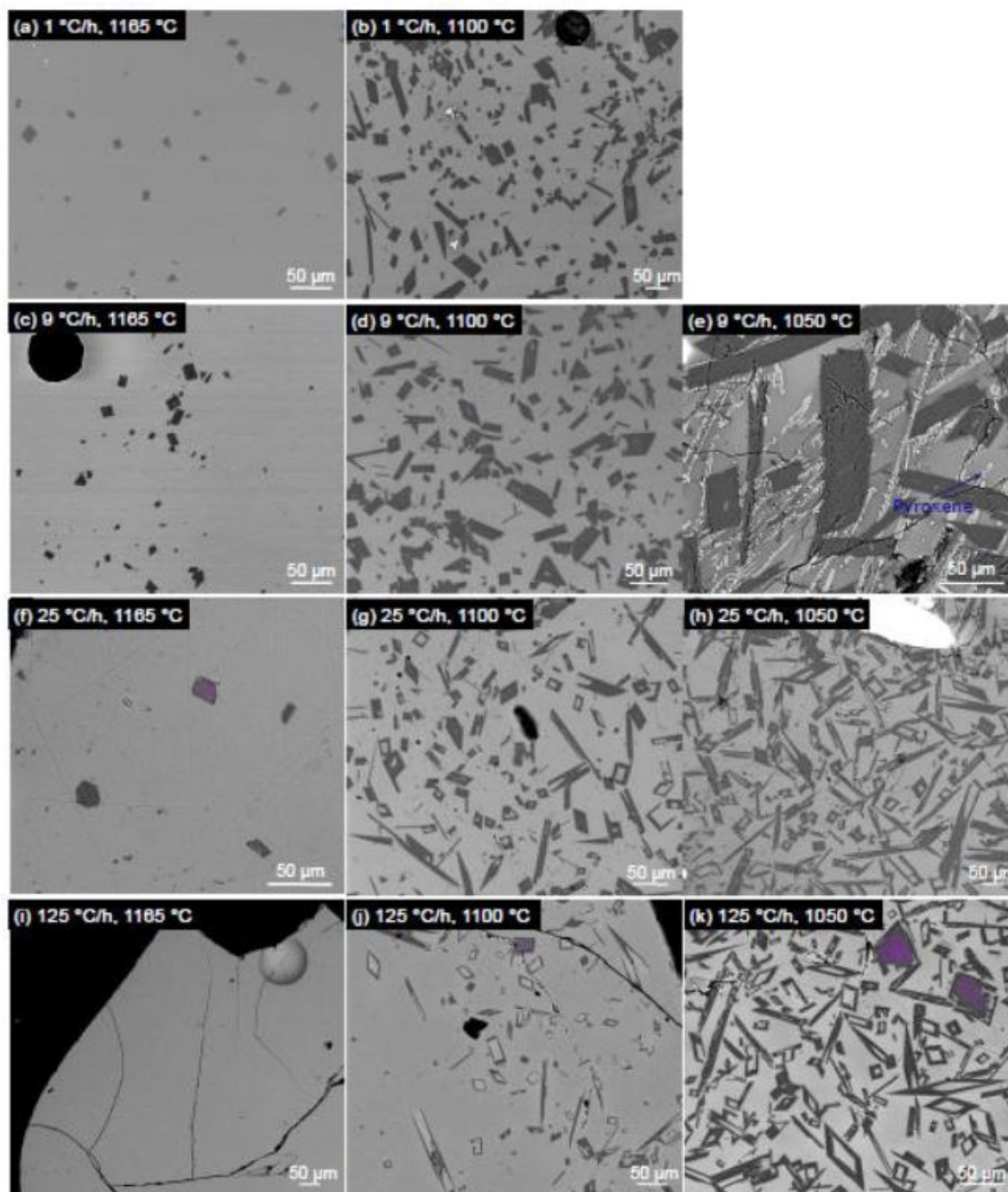


Fig. S2: BSE images of cooling runs conducted at **a, b** 1 °C/h, **c–e** 9 °C/h, **f–h** 25 °C/h, and **i–k** 125 °C/h, using the seed-bearing OS36 starting material initially heated to 1190 °C. The increase in cooling rate is marked by a global evolution from euhedral tabular/prismatic shapes at 1 °C/h (**b**) and 9 °C/h (**d–e**), to skeletal crystals with hopper cavities at 25 °C/h (**g–h**) and 125 °C/h (**j–k**). We also observed the depression of the liquidus temperature with increasing cooling rate; at 125 °C/h, no crystals are observed at 1165 °C (**i**). Purple areas in some panels correspond to the initial plagioclase fragment with an overgrowth part around.

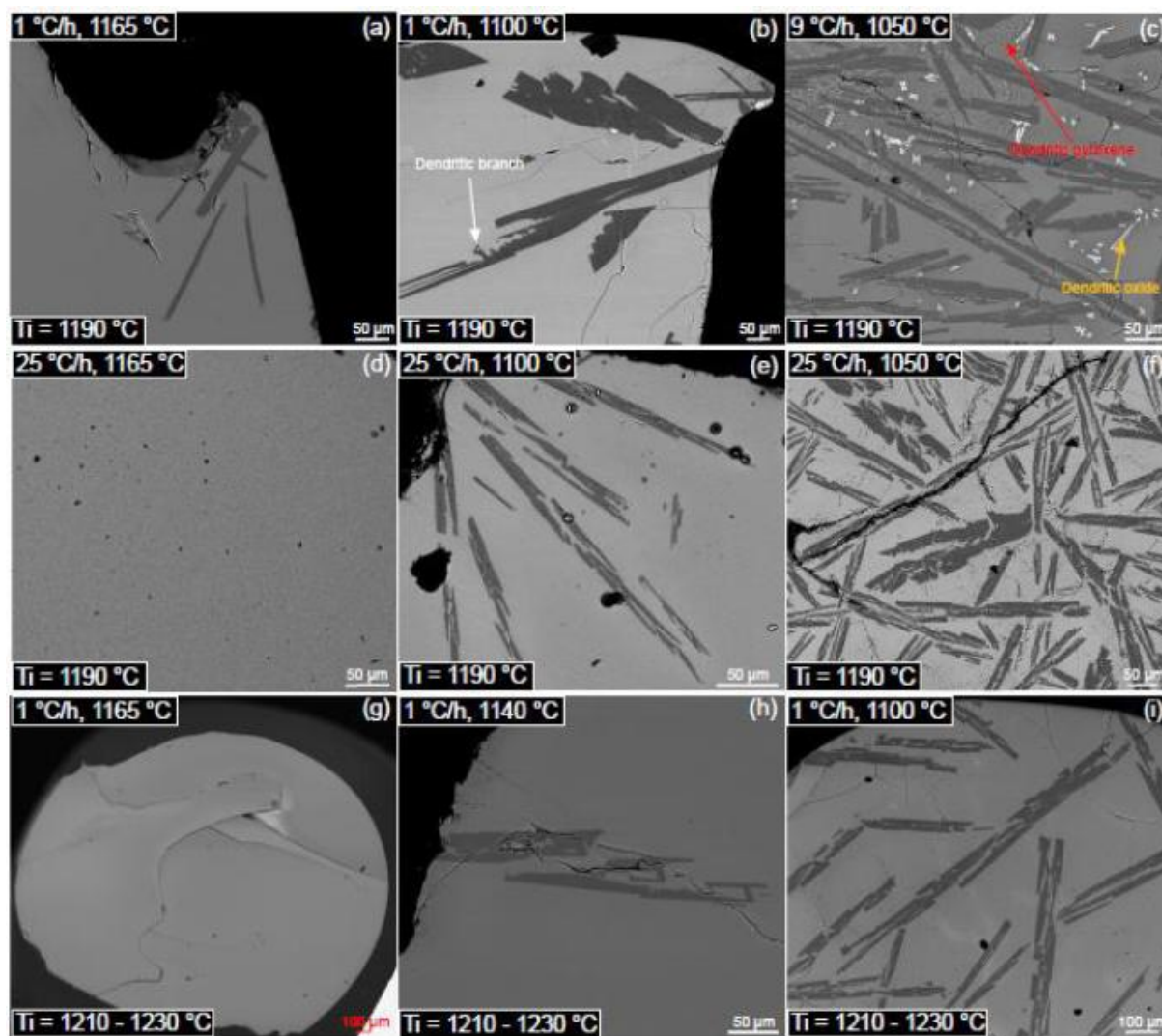


Fig. S3: BSE images of cooling runs conducted at **a, b** 1 °C/h, **c** 9 °C/h, and **d–f** 25 °C/h using the seed-free OS36* starting material initially heated to 1190 °C. Except for the run cooled at 1 °C/h and quenched at 1165 °C (**a**), which exhibits elongated plagioclase crystals, all other samples are characterized by dendritic plagioclase (**b–f**). Similar textures are observed in experiments involving a stronger initial superheating step to 35–55 °C above the liquidus temperature (**g–i**). Increasing the cooling rate (**d**) and the degree of initial superheating (**g**) leads to a decrease in the temperature at which nucleation begins.

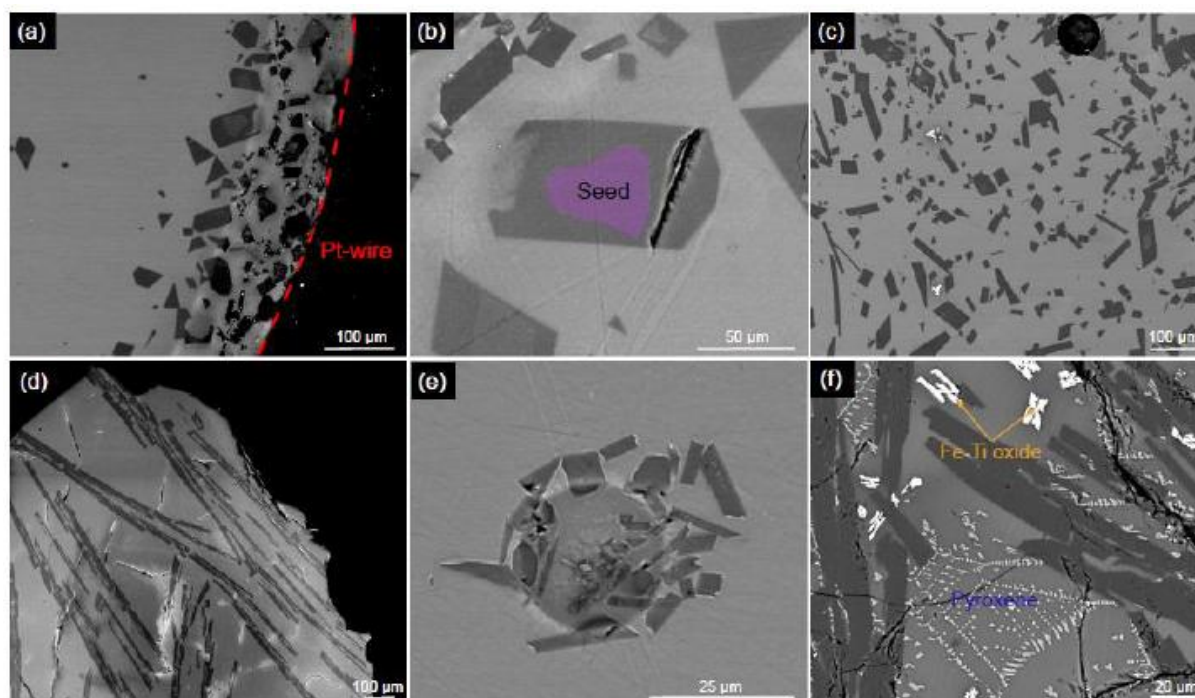


Fig. S4: BSE images illustrating the various types of nucleation observed in our experiments. **a, d** Plagioclase nucleation around the Pt wire and along the sample edges, respectively. The strong influence of the Pt-wire on nucleation is particularly evident at the onset of crystallization. **e, f** Heterogeneous nucleation on foreign substrates (e.g., bubbles and crystals of a different mineralogy). In contrast, we also observed **b** "self-nucleation," corresponding to overgrowth around a seed of the same crystallographic nature. Note the presence of a bright boundary layer surrounding the long axis of plagioclases nucleated from bubbles (**e**). **c** A typical texture from seed-bearing runs, where nucleation may result from either homogeneous or heterogeneous mechanisms, or a mixture of both.

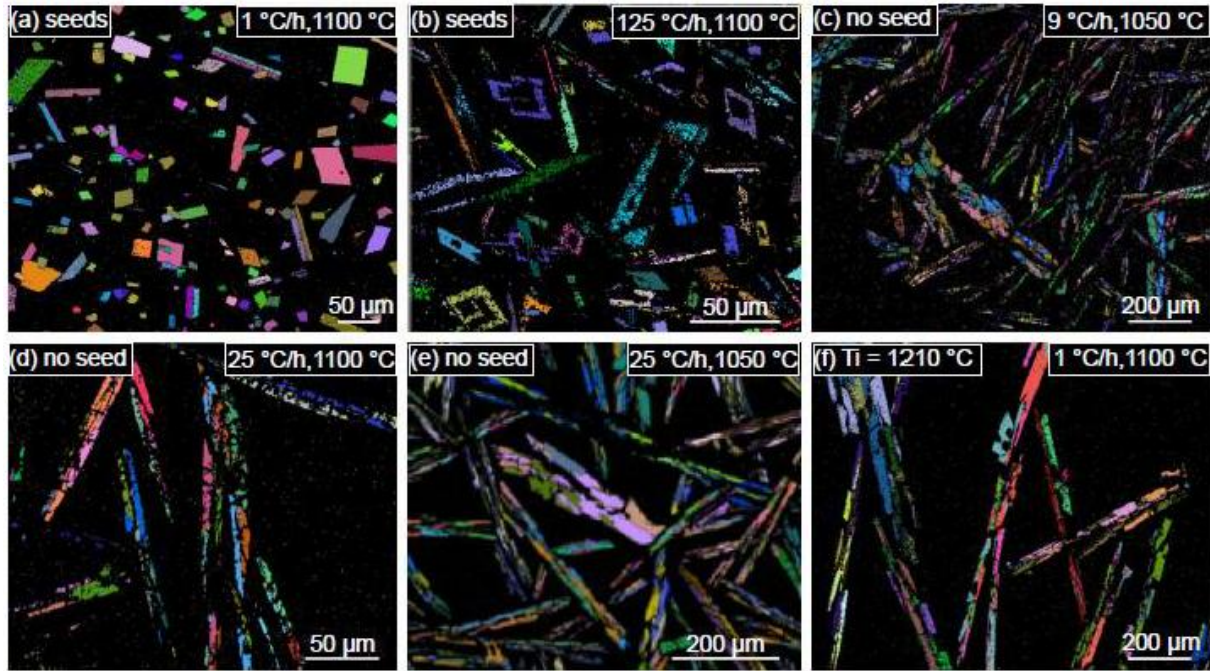


Fig. 5: EBSD images of twins in plagioclase crystals. **a, b** Crystals from seed-bearing experiments cooled at 1 °C/h and 125 °C/h, respectively. Most crystals in these runs do not contain twins. When present, twins are simple, involving only two twins. **c–f** Samples (seedfree) initially superheated to **c–e** $+\Delta T = 15$ °C and **f** $+\Delta T = 35$ °C. This samples contain complex twin boundaries associated with dendritic plagioclase textures.

TEXTURAL ANALYSIS

As in Billon et al. (2025), textural parameters such as phase proportions (φ_V), surface crystal and bubble number densities (N_A and N_p , determined by point counting in ImageJ), volumetric crystal number density (N_V), and the global mean crystal size (S_N) were calculated from the entire image of each sample as:

$$\varphi_V = \frac{\text{Total Plagioclase area}}{\text{Sample area}} \quad (\text{S1})$$

$$N_A = \frac{\text{Plagioclase crystal number}}{\text{Sample area}} \quad (\text{S2})$$

$$N_p = \frac{\text{Bubble number}}{\text{Sample area}} \quad (\text{S3})$$

$$S_N = \sqrt{\frac{\varphi_V}{N_A}} \quad (\text{S4})$$

$$N_V = \frac{N_A}{S_N} \quad (\text{S5})$$

Nucleation and growth rates calculated by the Batch, l_{mean} , and l_{max} methods) were then calculated from the global images of each experiment as:

$$G_{\text{max},l} = \frac{l_{\text{max},\text{av}}}{2t} \quad (\text{S6})$$

$$G_{\text{mean},l} = \frac{l_{\text{mean}}}{2t} \quad (\text{S7})$$

$$J_{\text{Batch}} = \frac{N_v}{t} \quad (\text{S8})$$

Crystal size parameters (l_{mean} , $l_{\text{max, av}}$) were measured from the various subsectional images, and the results were then combined to derive the final data for the overall sample. Incremental nucleation (J_i) and growth (G_i) rates were also determined for runs with various final dwell durations at the same final temperature to measure the nucleation and growth between two final dwell times (t_2 and t_1):

$$G_i = \frac{(l_{\text{mean}}/l_{\text{max,av}})_2 - (l_{\text{mean}}/l_{\text{max,av}})_1}{2x(t_2 - t_1)} \quad (\text{S9})$$

$$J_i = \frac{(N_v)_2 - (N_v)_1}{t_2 - t_1} \quad (\text{S10})$$

ANALYTICAL TECHNIQUES

SEM AND EPMA ANALYSES

EDS (Quanta-650F FEG-SEM at Cambridge University in England; Tescan MIRA 4 SEM at KU Leuven in BELGIUM) and WDS (CAMECA SX Five Tactics at the LMV in Clermont-Ferrand, France; JEOL JXA-8530F at the Department of Material Engineering, KU Leuven, Belgium; and JEOL JXA-ISP 100 in Aachen, Germany) analyses of glasses (using a defocused beam) and plagioclase crystals (focused beam) were performed in continuity with those of Billon et al. (2025). SEM imaging was performed at a working distance of 10–15 mm, with a dwell time of 10 μs and a voltage of 15 KV (20 KV for EDS analyses, with a beam current of 6–9 nA). Calibration details for WDS analyses are provided below.

The CAMECA SX Five Tactics (Clermont-Ferrand) calibration standards were the same as those of Bechon et al. (2022): wollastonite (Ca, Si), TiMnO₃ (Ti, Mn), Al₂O₃ (Al), fayalite (Fe), forsterite (Mg), albite (Na), Cr₂O₃ (Cr), orthoclase (K), and NiO (Ni).

Standards used for the JEOL JXA-8530F (KU Leuven) and JEOL JXA-ISP 100 (Aachen University) were the same as those used by [Billon et al. \(2025\)](#):

- JEOL JXA-8530F (KU Leuven):

- Obsidian (SiO_2 , Al_2O_3 , K_2O), apatite (P_2O_5), diopside (CaO), hematite (FeO), jadeite (Na_2O), olivine (MgO), rutile (TiO_2), rhodonite (MnO), chromium oxide (Cr_2O_3), and nickel (NiO) for glasses.
- Albite (Al_2O_3), diopside (SiO_2), apatite (P_2O_5), hematite (FeO), jadeite (Na_2O), olivine (MgO), obsidian (K_2O), diopside (CaO), rutile (TiO_2), chromium oxide (Cr_2O_3), and rhodonite (MnO) for plagioclase.
- JEOL JXA-ISP 100 (Aachen University):
 - Obsidian (SiO_2 , Al_2O_3 , K_2O), jadeite (Na_2O), olivine (MgO), apatite (P_2O_5), diopside (CaO), rutile (TiO_2), hematite (FeO), Mn oxide (MnO), and chromite (Cr_2O_3) for glasses.
 - Plagioclase (SiO_2 , Al_2O_3 , CaO), jadeite (Na_2O), olivine (MgO), apatite (P_2O_5), orthoclase (K_2O), rutile (TiO_2), hematite (FeO), Mn oxide (MnO), and chromite (Cr_2O_3) for plagioclase.
 - Plagioclase (Al_2O_3), olivine (SiO_2 , MgO), rutile (TiO_2), Magnetite (FeO), Mn oxide (MnO), chromite (Cr_2O_3), nickel (NiO) for magnetite.

The type of analysis (EDS/WDS) and the institution where analyses were performed are reported in **Supplementary file 2**. In the case of EDS analyses performed at KU Leuven and WDS data, the same secondary plagioclase and glass standards (compositions provided in **supplementary file 2**) were used to correct the data.

EBSD ANALYSES

All electron backscatter diffraction (EBSD) measurements were conducted at the University of Lille using a HITACHI SU5000 field-emission scanning electron microscope (FE-SEM) equipped with an Oxford Instruments Symmetry EBSD detector (CMOS). Analyses were performed at an accelerating voltage of 20 kV, with a beam current of a few nA, under a partial vacuum of 30 Pa, removing conductive coating, unsuitable for EBSD measurements. The samples were tilted 70° towards the EBSD detector. Diffraction patterns were acquired at high acquisition speed with a resolution of 156×128 pixels, integrating 2–3 frames per measurement.

Prior to EBSD analysis, samples were polished using $\frac{1}{4} \mu\text{m}$ diamond suspension, followed by final surface preparation with a Fishione Model 1061 ion polisher operated at 5 keV accelerating voltage, 5° milling angle, 50 % beam focus, and continuous rotation of the sample for 5 minutes.

CHEMICAL RESULTS

PLAGIOCLASE ANALYSIS

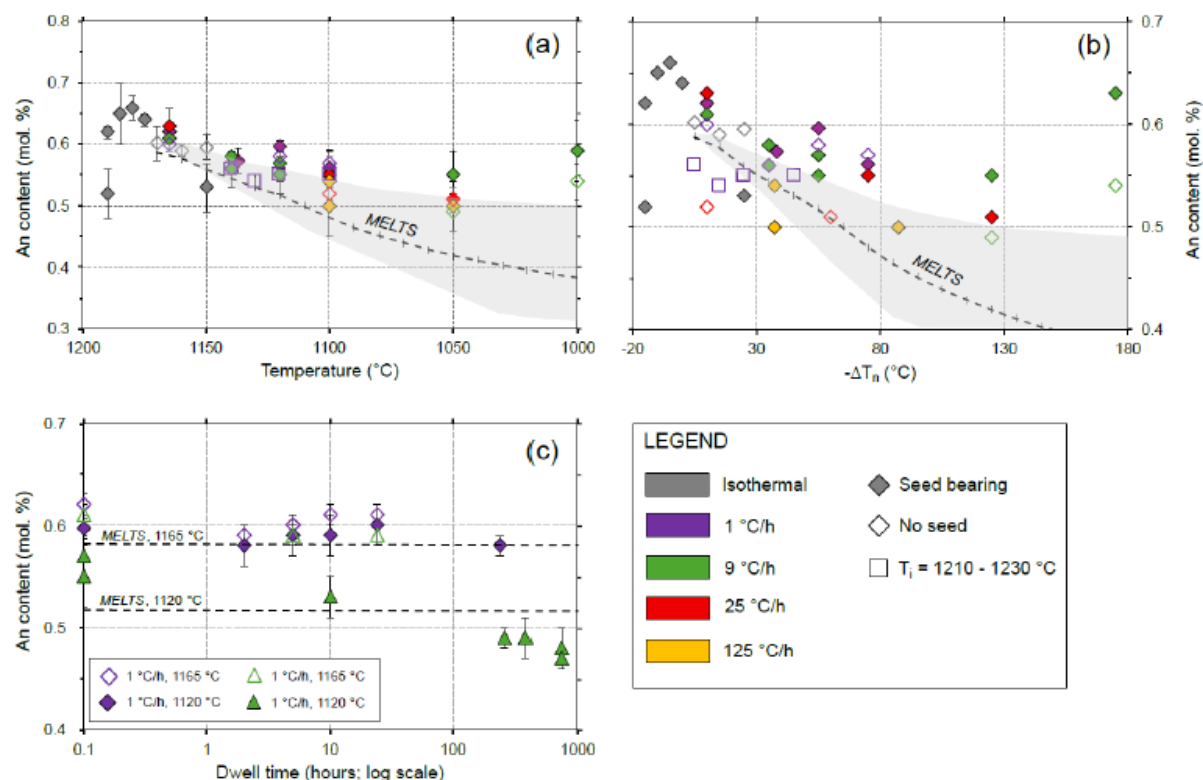


Fig. S1: Evolution of plagioclase anorthite content as a function of the solidification path. **a, b** Evolution during isothermal and cooling experiments, plotted against temperature (**a**) and nominal degree of undercooling (**b**). **c** Evolution as a function of the final dwell duration following cooling at 1 and 9 °C/h.

As explained by Billon et al. (2025), the anorthite contents of newly nucleated crystals or overgrowth rims were quite homogeneous, with 1σ standard deviations < 0.05 (see **Supplementary File 3**). The slightly higher anorthite content observed in our experiments compared to the Rhyolite-MELTS predictions, particularly below 1100 °C (**Fig. S1a, b**), can be attributed to the lower nucleation temperature of clinopyroxene in our runs (~ 1050 °C), as opposed to 1110–1115 °C estimated by Rhyolite-MELTS. This delay in clinopyroxene crystallization resulted in a relative enrichment of Al_2O_3 and CaO in the melt, thereby increasing the anorthite content of crystallizing plagioclase. Increasing the cooling rate and the degree of initial superheating appears to have decreased the anorthite content of crystallizing plagioclase (**Fig. S1a** and **b**). For example, in seeded experiments cooled at 25 and 125 °C/h, An contents ranged from 50 to 54 An%, whereas in experiments cooled at 1 and 9 °C/h, they ranged from 57 to 62 An%.

The addition of a final dwell duration shorter than 24 h did not impact plagioclase anorthite content (**Fig. S1c**). Runs quenched after final dwell durations > 240 hours (particularly experiments previously

cooled at 9 °C/h) showed a significant decrease of the anorthite content to around 47–49 An%. This strong decrease was simultaneous to the second nucleation event (**Fig. 6f**).

GLASS ANALYSIS

Isothermal and cooling runs

Despite minor variations, the overall liquid composition in isothermal runs (with or without pre-heating) was consistent with Rhyolite-MELTS predictions. Billon et al. (2025) showed that in seed-bearing runs cooled at 1 to 9 °C/h, the melt evolves from basalticandesitic/andesitic to dacitic as temperature drops to 1000 °C. Samples initially quenched at 25 and 125 °C/h follow a similar trend, though with a residual enrichment in MgO, Al₂O₃, and CaO (**Fig. S2 a, c, g**). The sharp increase in MgO at 1050 °C from 9 to 125 °C/h correlates with decreasing clinopyroxene content, down to 1% and 0% at 25 and 125 °C/h, respectively.

In runs superheated to 1450 °C to remove plagioclase seeds, the residual melt composition depended on cooling rate. Despite slight enrichments in FeO(t), likely due to lower Fe-Ti oxide content, and CaO, the general melt evolution remains comparable at 1 °C/h (**Fig. S2 b, d, h**). However, samples cooled at 25 °C/h showed distinct melt compositions. The decrease in nucleation temperature between 1165 and 1100 °C did not significantly affect chemistry, which we attribute to the limited plagioclase proportion: from <1% at 1165 °C to only ~5% (mostly along sample edges) at 1100 °C. At 1050 °C, plagioclase proportions reached ~36% and MgO content increased (possibly due to the absence of other phases like clinopyroxene), while Al₂O₃ and CaO contents decreased slightly (**Fig. S2 b, d**). A similar Al₂O₃ enrichment between 1165 and 1130 °C was observed in runs initially heated to 1210–1230 °C, likely also due to delayed nucleation.

The strong FeO(t) depletion observed (**Fig. S2 f**) is harder to explain. It likely involves more than just the absence of clinopyroxene and Fe-Ti oxides. Iron loss during the experiments, possibly due to the run durations, may be a contributing factor.

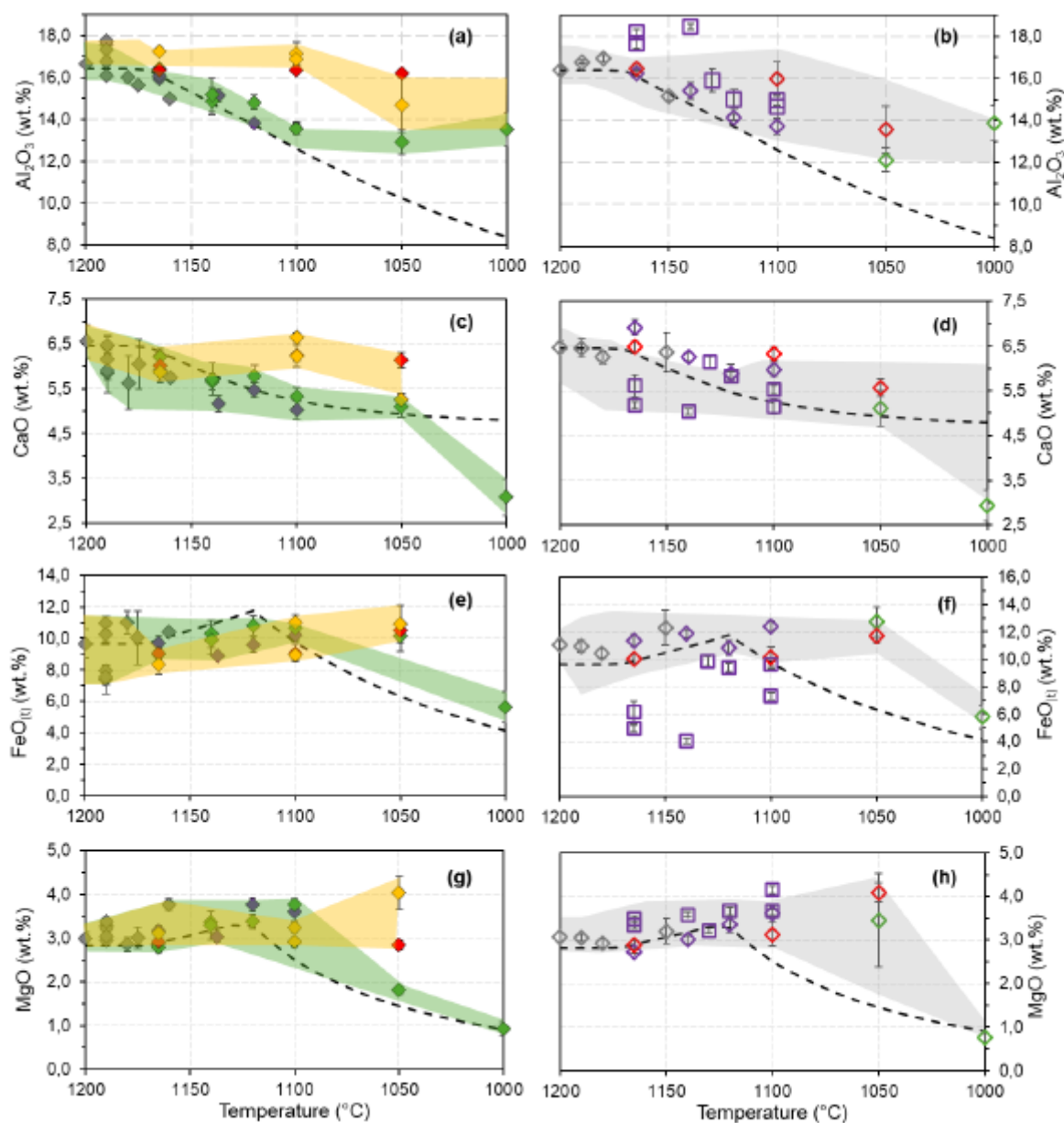


Fig. S2: Evolution of the residual liquid composition as a function of quench temperature. **a, c, e, g** Seed-bearing starting materials. Green and yellow shaded areas refer to the compositions at slow (1 and 9 °C/h) and fast cooling rates (25 and 125 °C/h), respectively. **b, d, f, h** Crystal-free starting materials at various degrees of initial superheating ($+\Delta T = 15, 35\text{--}55$ °C). For reference, the gray shaded area indicates the range of chemical evolution observed in the seed-bearing runs.

The maturation step

It is difficult to discern any clear trend in the chemical evolution of the residual liquid. Despite minor variations, the composition at the onset of crystallization (1165 °C) remained relatively stable for dwell durations between 2 and 24 h. More pronounced fluctuations nevertheless occurred at 1120 °C ($-\Delta T_n = 55$ °C). Samples previously cooled at 1 °C/h generally showed relatively stable Al_2O_3 , CaO, MgO, and FeO(t) contents throughout the dwell period from 5 to 240 h (**Fig. S3**). For the longest dwell times (>240 hours), a decrease in FeO(t) and

MgO contents was observed between 264 h (10.18 wt.% FeO(t) and 3.7 wt.% MgO) and 744 h (8.1 wt.% FeO(t) and ~3.5 wt.% MgO), possibly due to the crystallization of clinopyroxene (as evidenced by abundant quench crystals and a few phenocrysts) and a late increase in Al₂O₃ content (**Fig. S3a, c, d**).

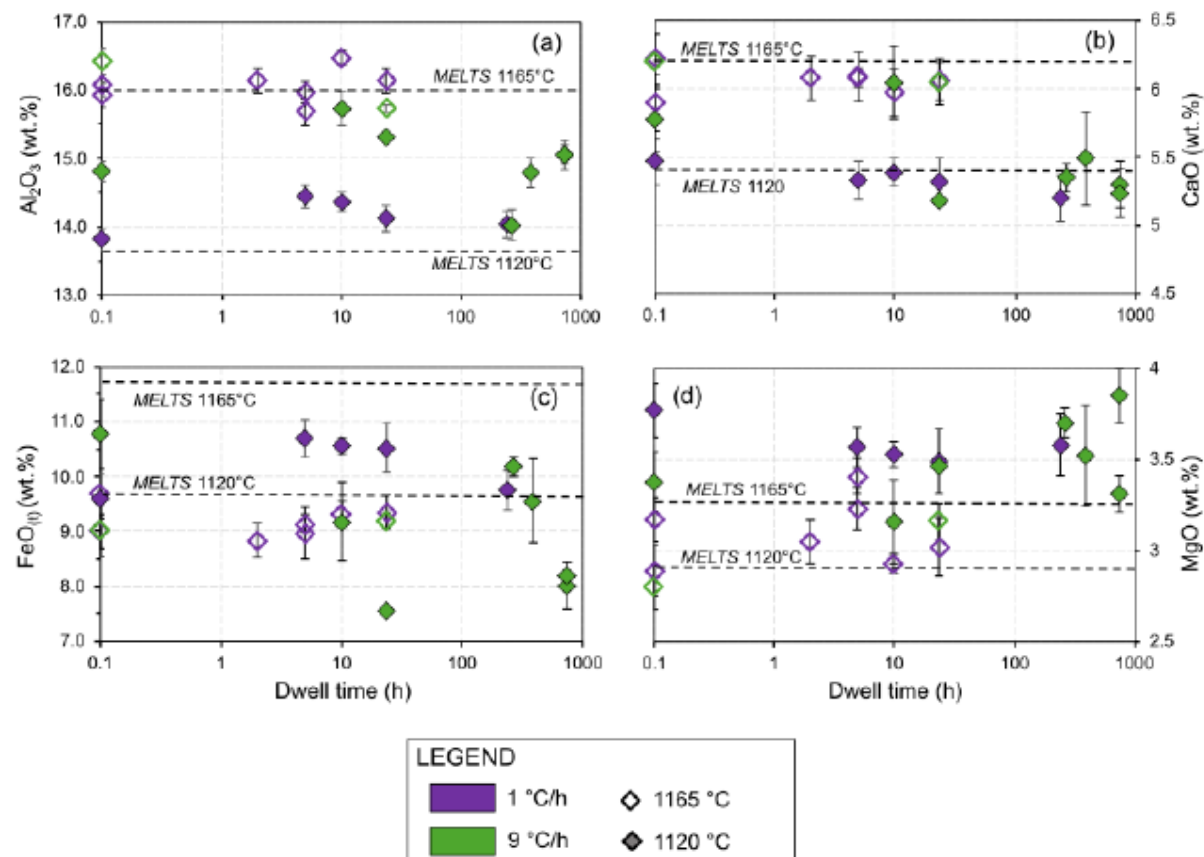


Fig. S3: Evolution of the residual liquid composition as a function of the final dwell duration following cooling at 1 and 9 °C/h. **a–d** Concentrations of Al₂O₃, CaO, FeO(t), and MgO, respectively.

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- Billon, M., Vander Auwera, J., Namur, O., Faure, F., Holness, M. B. & Charlier, B. (2025). Plagioclase crystal size distributions, growth and nucleation rates in an anhydrous arc basaltic andesite. *Contributions to Mineralogy and Petrology* **180**.

Supplementary Information File 2

XRF PARAMETERS AND COMPO

TITLE	descriptive title of the dataset	Bulk composition of the starting materials
ABSTRACT	brief description of dataset, please aim for <250 words	Bulk analysis of the two starting materials (OS36 and OS36*) used in this paper for the experiments
CONTACT INFO	contact email for the creator of the template	
Related Publication #1		
Title	Petrology of the magmatic system beneath Osorno volcano (Central Southern Volcanic Zone, Chile)	
Authors	Tonin Bechon ^a , Melvyn Billon ^a , Olivier Namur ^b , Olivier Bolle ^a , Paul Fugmann ^a , H������ Foucart ^{a,c} , Jean-Luc Devidal ^a , Nicolas Delmelle ^a , Jacqueline Vander Auwera ^a	
Publication Year	2022	
Journal	Lithos	
Volume	426 - 427	
Issue		
Pages		
DOI	https://doi.org/10.1016/j.lithos.2022.106777	
Related Publication #2		
Title	Mantle Melting and Magmatic Processes Under La Picada Stratovolcano (CSVZ, Chile)	
Authors	Jacqueline Vander Auwera ¹ , Olivier Namur ^{1,2,3} , Adeline Dutrieux ^{1,4} , Camilla Maya Wilkinson ⁵ , Morgan Ganerod ⁵ , Valentin Coumont ¹ and Olivier Bolle ¹	
Publication Year	2019	
Journal	Journal of Petrology	
Volume	60	
Issue		
Pages	907 - 944	
DOI	https://doi.org/10.1093/petrology/egz020	

IDENTIFICATION		LOCATION				DESCRIPTION		
SAMPLE NAME	Refrence	LATITUDE	LONGITUDE	ELEVATION	LOCATION KEYWORDS	LITHOLOGY	age	depth in core
		decimal degrees, negative to indicate S	decimal degrees, negative to indicate W	in meters with respect to sea level		rock type	age	depth in core, if applicable, in cm
OS36	Bechon et al. (2022)	41,1163	-72,5329	-	Osorno (CHILE)	Basaltic Andesite (lava)	1835	-
OS36*	OS36 heated at 1450 ��C during 2 hours in a muffle furnace	-	-	-	-	Basaltic Andesite (lava)	-	-

ANALYZED MATERIAL	species	size fraction	sample preparation	chemical treatment
e.g. whole rock, volcanic glass, mineral, fossil	if mineral or fossil e.g. plagioclase, <i>Cibicides</i> <i>wuellerstorfi</i>	e.g. <2mm	e.g. crushed in agate mill, sieved at 500 microns	e.g. whole rock samples were dissolved in 0.1M HF + 5.0M HNO ₃
Whole rock	-	< 100 µm	crushed with a hammer and then ground in agate mortar with a Fritsch pulverisette planetary mill	The major elements were measured on fused glass discs that were prepared with 0.35 g of rock powder, previously dried at 1000°C for two hours in the oven, and lithium- and tetra-borate.
Whole rock	-	< 100 µm (see in Supp. File 3)	crushed with a hammer and then ground in agate mortar with a Fritsch pulverisette planetary mill	The major elements were measured on fused glass discs that were prepared with 0.35 g of rock powder, previously dried at 1000°C for two hours in the oven, and lithium- and tetra-borate.

ANALYTICAL PROCEDURE		
TECHNIQUE	INSTRUMENT	LABORATORY
	e.g. ThermoARL XRF, Agilent 7700 ICP-MS	e.g. Woods Hole Oceanographic Institute
XRF	X-ray fluorescence Thermofisher PERFORM'X	University of Liège (Uliège)
XRF	X-ray fluorescence Thermofisher PERFORM'X	University of Liège (Uliège)

ANALYTICAL ACCURACY & REPRODUCIBILITY		
reference sample name	reference uncertainty	Uncertainty estimation
e.g. BCR-1	standard deviation	standard deviation
XRF raw data were corrected following the Traill-Lachance algorithm and calibrated using 62 international standards (basalts, syenites, granites, ultramafic rocks, minerals and soils)	Analytical errors on major element chemistry were estimated using repeat analyses of the BEN international standard.	The accuracy estimated by repeated analysis of external standards is better than 3.5% for all major elements, except for TiO ₂ (4.9%), Na ₂ O (12.4%) and P ₂ O ₅ (10.3%). The 1σ analytical precision is better than 1% for all major elements, except for Na ₂ O (1.3%) and P ₂ O ₅ (3.2%).
XRF raw data were corrected following the Traill-Lachance algorithm and calibrated using 62 international standards (basalts, syenites, granites, ultramafic rocks, minerals and soils)	Analytical errors on major element chemistry were estimated using repeat analyses of the BEN international standard.	The accuracy estimated by repeated analysis of external standards is better than 3.5% for all major elements, except for TiO ₂ (4.9%), Na ₂ O (12.4%) and P ₂ O ₅ (10.3%). The 1σ analytical precision is better than 1% for all major elements, except for Na ₂ O (1.3%) and P ₂ O ₅ (3.2%).

	XRF (wt.%)										
	SiO ₂	TiO ₂	Al ₂ O ₃	FeO _{tot}	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Cr ₂ O ₃
OS36	56.94	1.3	16.27	9.56	0.18	2.79	6.39	4.32	0.91	0.26	0
OS36*	56.5	1.27	16.33	10.98	0.18	2.89	6.23	4.5	0.93	0.23	0
Diff (%)	0.77	2.31	0.37	14.85	0.00	3.58	2.5	4.17	2.2	11.54	-

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Standard		SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O _{3t}	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅
BE-N (basalt)	Reference value	38,2	2,61	10,07	12,84	0,2	13,15	13,87	3,18	1,39	1,05
	Average (n=99)	39,8	2,76	10,34	13,44	0,2	13,72	14,42	3,15	1,45	1,10
	Standard deviation - 1σ	0,2	0,03	0,09	0,11	0,0	0,15	0,11	0,16	0,02	0,02
	Relative error on Accuracy (%)	4,2	5,77	2,72	4,69	1,2	4,32	3,97	0,93	4,50	5,20
	Precision (%) - 1σ	0,5	1,12	0,85	0,83	2,2	1,12	0,78	5,12	1,34	1,83
	Max Analyzed	70	1	21	12	0	11	11	5	4	0,266
	Max absolute error - 1σ	0,3	0,02	0,2	0,1	0,01	0,1	0,1	0,3	0,05	0,005

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RHYOLITE MELTS

		RhyoliteMelt (Liquid)					RhyoliteMelt (Plg: An content)			
T° (°C)		SiO ₂ (%wt)	CaO (%wt)	Al ₂ O ₃ (%wt)	MgO (%wt)	FeO _t (%wt)	New crystals	Summary	Average	1 sigma
1200,00	-25,00	57.43	6.45	16.41	2.82	9.65				
1190,00	-15,00	57.43	6.45	16.41	2.82	9.65				
1180,00	-5,00	57.43	6.45	16.41	2.82	9.64				
1170,00	5,00	57.45	6.42	16.35	2.83	9.69	0.59	0.5871	0,59	0
1160,00	15,00	57.6	6.21	15.81	2.95	10.09	0.57	0.5871	0,58	0,01
1150,00	25,00	57.73	6.00	15.28	3.06	10.49	0.55	0.5695	0,56	0,02
1140,00	35,00	57.84	5.81	14.76	3.18	10.89	0.53	0.5598	0,54	0,02
1130,00	45,00	57.93	5.63	14.25	3.3	11.3	0.51	0.5507	0,53	0,03
1120,00	55,00	58.07	5.46	13.73	3.28	11.74	0.49	0.5419	0,52	0,04
1110,00	65,00	59.99	5.34	13.16	2.86	10.71	0.47	0.5322	0,50	0,05
1100,00	75,00	61.74	5.24	12.61	2.51	9.76	0.44	0.5158	0,48	0,05
1090,00	85,00	63.33	5.15	12.09	2.23	8.93	0.42	0.5043	0,46	0,06
1080,00	95,00	64.76	5.08	11.58	1.99	8.17	0.40	0.4954	0,45	0,06
1070,00	105,00	66.07	5.02	11.11	1.78	7.48	0.39	0.4881	0,44	0,07
1060,00	115,00	67.27	4.97	10.65	1.6	6.88	0.38	0.4819	0,43	0,08
1050,00	125,00	68.38	4.93	10.22	1.45	6.32	0.36	0.4765	0,42	0,08
1040,00	135,00	69.4	4.89	9.81	1.31	5.8	0.35	0.4718	0,41	0,09
1030,00	145,00	70.34	4.86	9.42	1.2	5.34	0.34	0.4676	0,40	0,09
1020,00	155,00	71.21	4.83	9.05	1.09	4.91	0.33	0.4639	0,40	0,10
1010,00	165,00	72.02	4.81	8.7	1.00	4.52	0.32	0.4605	0,39	0,10
1000,00	175,00	72.78	4.79	8.37	0.91	4.15	0.31	0.4575	0,38	0,11

EPMA EDS PARAMETERS

IDENTIFICATION					
Metadata Field	date	TECHNIQUE	INSTRUMENT	LABORATORY	Reference
	26 November 2024	SEM-EDS (only for 3 samples)	Quanta-650F FEG-SEM	Cambridge University (ENGLAND)	
	-	SEM-EDS	Tescan MIRA 4 SEM	KULeuven (BELGIUM)	
	6 and 7 January 2022	EPMA	CAMECA SX Five Tactics	LMV Clermont-Ferrand (FRANCE)	see Billon et al. 2025
	January 2023	EPMA	JEOL JXA-8530F	KULeuven (BELGIUM)	
	3 to 6 June 2024	EPMA	JEOL JXA-ISP 100	Aachen university (GERMANY)	

ANALYTICAL PROCEDURE									
BEAM VOLTAGE	BEAM CURRENT	Working distance	BEAM DIAMETER	BEAM RASTER	SECONDARY REFERENCE MATERIALS	WDS utilization	WDS configuration	EDS utilization	EDS configuration
20 kV	6 - 9 nA	20 mm	Focused beam (1 µm; Plg), unfocused (Large ROX; Glass)	-	-	No	-	Yes	
20 kV	6 - 9 nA	20 mm	Focused beam (1 µm; Plg), unfocused (Large ROX; Glass)	-	Basaltic glass (NMNH 110240-52), and Plagioclase (NMNH 115300)	No	-	Yes	
15 kV	15 nA (6 nA for Glass)	10 mm	Focused beam (1 µm; Plg), unfocused (20 µm; Glass)	-	External international Std A93, Albite and Orthoclase primary Std check before each session	Yes	-	No	-
15 kV	20 nA (10 nA for Glass)	10 mm	Focused beam (1 µm; Plg), unfocused (10 µm; Glass)	-	Basaltic glass (NMNH 110240-52), and Plagioclase (NMNH 115300)	Yes	5 WDS spectrometers	No	-
15 kV	20 nA (10 nA for Glass)	10 mm	Focused beam (1 µm; Plg), unfocused (10 µm; Glass)	-	Plg64 (Labradorite), Mag53 (Magnetite), G33 (Obsidian, Na-K-Al-Fe-Silicaglas)	Yes	5 WDS spectrometers	No	-

Beam damage minimization	Drift correction	X-ray matrix corrections	Additional notes
	EDS software automatically applies a drift correction (based on realignment of reference peaks).	-	
	Secondary standards (same as the EPMA std at the KULeuven) are measured at the beginning and end of each day. EDS software automatically applies a drift correction (based on realignment of reference peaks).	-	
Using a moderate beam voltage, beam current, and short counting time (< 30 s), allow to minimize the Na and K losses (measured in first in different channels)	Primary and secondary standards are measured at beginning and end of each day and calibration interpolated; Remaining primary standards run only once either beginning or end of session	-	
Using a moderate beam voltage, beam current, and short counting time (< 30 s), allow to minimize the Na and K losses (measured in first in different channels)	Primary and secondary standards are measured at beginning and end of each day and calibration interpolated; Remaining primary standards run only once either beginning or end of session	-	
Using a moderate beam voltage, beam current, and short counting time (< 30 s), allow to minimize the Na and K losses (measured in first in different channels)	Primary and secondary standards are measured at beginning and end of each day and calibration interpolated; Remaining primary standards run only once either beginning or end of session	-	

LMV Clermon (see Bechon et al. 2022)

KULeuven

Plagioclase	SiO ₂	20	VDS Channel 1	2	TAP		Ka	10		10 sec	Differential	
	TiO ₂	20	VDS Channel 4	3	LIFH		Ka	10		10 sec	Integral	
	Al ₂ O ₃	20	VDS Channel 1	1	TAP		Ka	10		10 sec	Differential	
	FeO _{tot}	20	VDS Channel 2	1	LIF		Ka	10		10 sec	Integral	
	MnO	20	VDS Channel 5	2	LIFH		Ka	10		10 sec	Integral	
	MgO	20	VDS Channel 3	2	TAPH		Ka	10		10 sec	Differential	
	CaO	20	VDS Channel 4	2	PETH		Ka	10		10 sec	Integral	
	Na ₂ O	20	VDS Channel 3	1	TAPH		Ka	10		10 sec	Differential	
	K ₂ O	20	VDS Channel 4	1	PETH		Ka	10		10 sec	Integral	
	P ₂ O ₅	20	VDS Channel 1	3	TAP		Ka	10		10 sec	Differential	
	Cl ₂ O ₃	20	VDS Channel 5	1	LIFH		Ka	10		10 sec	Integral	

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Plagioclase	SiO ₂	20	VDS Channel 1	2	TAPL		Ka	10		10 sec	Differential	
	TiO ₂	20	VDS Channel 4	3	PET/J		Ka	10		10 sec	Differential	
	Al ₂ O ₃	20	VDS Channel 1	1	TAPL		Ka	10		10 sec	Differential	
	FeO _{tot}	20	VDS Channel 5	1	LFH		Ka	20		20 sec	Differential	
	MnO	20	VDS Channel 5	2	LFH		Ka	10		10 sec	Differential	
	MgO	20	VDS Channel 2	2	TAP		Ka	10		10 sec	Differential	
	CaO	20	VDS Channel 4	2	PET/J		Ka	10		10 sec	Differential	
	Na ₂ O	20	VDS Channel 2	1	TAP		Ka	20		20 sec	Differential	
	K ₂ O	20	VDS Channel 4	1	PET/J		Ka	10		10 sec	Differential	
	P ₂ O ₅	20	VDS Channel 3	1	PET/J		Ka	10		10 sec	Differential	
	Cr ₂ O ₃	20	VDS Channel 5	3	LFH		Ka	10		10 sec	Differential	
Magnetite	SiO ₂	20	VDS Channel 1	2	TAPL		Ka	20		20 sec	Integral	
	TiO ₂	20	VDS Channel 4	1	PET/J		Ka	20		20 sec	Differential	
	Al ₂ O ₃	20	VDS Channel 1	1	TAPL		Ka	10		10 sec	Differential	
	FeO _{tot}	20	VDS Channel 5	1	LFH		Ka	10		10 sec	Differential	
	MnO	20	VDS Channel 5	2	LFH		Ka	20		20 sec	Differential	
	MgO	20	VDS Channel 2	1	TAP		Ka	20		20 sec	Differential	
	Cr ₂ O ₃	20	VDS Channel 5	3	LFH		Ka	20		20 sec	Differential	
	NiO	20	VDS Channel 5	4	LFH		Ka	20		10 sec	Differential	



Glass	SiO ₂	10	VDS Channel 1	1	TAPL		K _a	20	20 sec	Differential	
	TiO ₂	10	VDS Channel 4	3	TAPL		K _a	10	10 sec	Differential	
	Al ₂ O ₃	10	VDS Channel 1	2	PETJ		K _a	20	20 sec	Differential	
	FeO _{tot}	10	VDS Channel 5	1	LFH		K _a	20	20 sec	Differential	
	MnO	10	VDS Channel 5	2	LFH		K _a	10	10 sec	Differential	
	MgO	10	VDS Channel 2	2	TAP		K _a	20	20 sec	Differential	
	CaO	10	VDS Channel 4	2	PETJ		K _a	10	10 sec	Differential	
	Na ₂ O	10	VDS Channel 2	1	TAP		K _a	10	10 sec	Differential	
	K ₂ O	10	VDS Channel 4	1	PETJ		K _a	20	20 sec	Differential	
	P ₂ O ₅	10	VDS Channel 3	1	PETJ		K _a	10	10 sec	Differential	
	Cr ₂ O ₃	10	VDS Channel 5	3	LFH		K _a	10	10 sec	Differential	

LMV Clermon (see Bechon et al. 2022)

CALIBRATION				PROCEDURAL BLANK		NORMALIZATION (standards-based correction)		Instrumental correction	DETECTION LIMIT		
Primary Standard Name	Primary Standard ID	Interfering Elements	Interference Correction Standards	Blank Method	Blank Samples	Normalization Method	Normalization Standards	ZAF, ...	Detection Limit	Unit	Detection Limit Method
reference material used for element standardization (calibration)	IGSN, GeoPAM-ID, Synthesis number, or similar	list any elements for which a spectral interference correction was used (e.g. Ba as interfered by Ti), as determined by TLA	reference materials used to calibrate the interference correction	e.g. single sample, multi-sample weighed mean	reference materials used to determine the blank correction	e.g. single sample, multi-sample weighed mean	e.g. JAF-D2		at 95% confidence (3 sigma)	e.g. weight percent, ppm	method used to compute the method detection limit
wollastonite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,05	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
Orthoclase	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,03	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
Fe ₂ O ₃	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,05	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
forsterite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,03	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
wollastonite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,03	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
albite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,03	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
Orthoclase	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Primary standards (table for Na and orthoclase for K and Al) were checked before each analytical session	ZAF	0,02	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
Wollastonite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,09	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
TiM ₂ O ₃	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,04	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
Obsidian	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,03	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
Fe ₂ O ₃	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,09	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
TiM ₂ O ₃	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,08	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
forsterite (PbO)	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,04	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
wollastonite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,04	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
albite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,05	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
orthoclase	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,02	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
Agalite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	ZAF	0,05	wt. %	Mean of VDS detection limits at 95% confidence, as computed by Probe for EPMA, converted from
-	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	External international Std A39	-	-	-	-

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olivine	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
rutile	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,02	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
plagioclase	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
magnetite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,03	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Mn oxide	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,02	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
olivine	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
chromite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,02	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
nickel	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Nickel oxide (NiOx), Aachen; Magnetite (MagFe), Aachen; Rutile (RuTi), Aachen; Chromite (CrFe), Aachen; Mn oxide (MnOx), Aachen	ZAF	0,03	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Obsidian	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Rutile	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Obsidian	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Hematite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,02	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Mn oxide	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,03	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Olivine	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Diopside	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,02	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Jadeite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Obsidian	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,01	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Apatite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,02	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from
Chromite	-	-	-	offline, multi-standard calibration, mean (major element in main mineral) blank correction, computed and applied in Excel	Blank correction was applied, but no details on the reference materials used are available	multiple point per crystal, and the mean ± standard deviation was calculated	Obsidienne (GS29), Jadeite (J87), Aachen; Diopside (Di8), Aachen; Magnetite (MagFe), Aachen	ZAF	0,03	wt. %	Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from Mean of VDS detection limits at 99% confidence, as computed by Probe for EPMA, converted from

OFFICIAL CHEMICAL COMPOSITION (WT.%)

	Secondary Std	SiO ₂	TiO ₂	Al ₂ O ₃	FeO _{Tot}	MnO	MgO	CaO	Na ₂ O	K ₂ O
KULeuven	Plagioclase (NPN4115900)	51,25	0,05	30,91	0,46	0,01	0,14	13,64	3,45	0,18
KULeuven	Glass (V02)	50,81	1,65	14,06	11,84	0,22	6,95	11,12	2,62	0,19
LMV Clermont	A99 (Thorber et al. (2002))	51,06	3,95	12,44	13,15	0,19	5,04	9,04	2,72	0,82
LMV Clermont	A99 (Oludottir et al. 2011)	51,00	4,17	12,65	13,20	0,20	5,01	9,14	2,69	0,86
LMV Clermont	A99 (Iaroscovich et al. (1979))	50,94	4,06	12,49	13,30	0,15	5,08	9,30	2,66	0,82
LMV Clermont	Orthoclase	65,00	-	16,08	1,20	-	0,03	0,12	16,35	-
LMV Clermont	Albite	68,03	-	19,05	0,06	-	0,15	0,63	11,43	0,22
Aachen University	Plagioclase (Pi84, Labradorite)	51,25	0,05	30,91	0,46	0,01	0,14	13,64	3,45	0,18
Aachen University	Jadeite (J107)	59,1	0	22,2	1,17	0	0	2,1	14,2	0
Aachen University	Apatite (Ap70)	0	0	0	0	0	0	55,6	0	0
Aachen University	Orthoclase (O79)	64,65	0	17,04	1,68	0	0	0	0,94	15,4
Aachen University	Rutile (Ru3)	0	1	0	0	0	0	0	0	0
Aachen University	Hematite (Hem84)	0	0	0	89,9	0	0	0	0	0
Aachen University	Mn oxide (Mn133)	0	0	0	0	92,5	0	0	0	0
Aachen University	Chromite (Cr154)	0	0	9,92	11,72	0,11	15,2	0,12	0	0
Aachen University	Magnetite (Mag53)	0	0,16	0	90,9	0,01	0,05	0	0	0
Aachen University	NiO oxide (NiO148)	0	0	0	0	0	0	0	0	0
Aachen University	Obsidian (G139)	73,94	0,1	13,11	1,72	0,06	0,07	0,76	4,06	5,04

	P ₂ O ₅	Cr ₂ O ₃	NiO	Tot	
0	0	0	0	100,09	
0,20	0,00	0,00	0,00	99,86	
0,43	-	-	-	99,84	418 points
0,46	-	-	-	99,35	1536 points
0,38	-	-	-	99,18	
-	-	-	-	99,88	
-	-	-	-	99,57	
0	0	0	0	100,09	
0	0	0	0	98,77	
42,2	0	0	0	97,8	Fluor no listed here
0	0	0	0	99,71	
0	0	0	0	1	
0	0	0	0	89,9	Value with FeO(t)
0	0	0	0	92,5	
0	60,5	0	0	97,57	
0	0,25	0	0	91,37	
0	0	0	99,9	99,9	
0	0	0	0	98,86	

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PLAGIOCLASE

Place	EDS/WDS	Observation	Initial Pre-heating	Sample	Phase	position	Cooling rate (°C/h)	Chemical analyses (wt%)											Total	An content			
								Ti(Cl)	Ti(Cl)	final step (h)	SiO ₂	TiO ₂	Al ₂ O ₃	FeO ₃	MgO	MgO	CaO	Na ₂ O			K ₂ O	P ₂ O ₅	Cr ₂ O ₃
Aachen	WDS	No	-	Plagioclase	Pig 1	ISOTHERMAL	1200	1200	24	45.76	0.00	33.86	0.81	0.01	0.06	17.53	1.53	0.05	0.00	0.02	99.68	0.86	
Aachen	WDS	No	-	Plagioclase	Pig 2	ISOTHERMAL	1200	1200	24	46.24	0.00	33.56	0.86	0.03	0.07	17.28	1.75	0.05	0.00	0.01	99.85	0.84	
Aachen	WDS	No	-	Plagioclase	Pig 3	ISOTHERMAL	1200	1200	24	46.22	0.00	33.43	0.84	0.00	0.09	16.33	1.83	0.04	0.01	0.00	99.39	0.83	
Aachen	WDS	No	-	Plagioclase	Pig 4	ISOTHERMAL	1200	1200	24	45.08	0.00	34.22	0.94	0.01	0.08	17.93	1.34	0.04	0.01	0.02	99.56	0.88	
Average											45.83	0.00	33.77	0.84	0.01	0.07	17.40	1.63	0.04	0.00	0.01	0.85	0.85
Leuven	WDS	No	-	1 sigma	Plagioclase	Pig 1	ISOTHERMAL	1150	1150	24	51.25	0.07	31.67	1.02	0.04	0.08	14.39	2.23	0.11	0.00	0.00	101.95	0.70
Leuven	WDS	No	-	G0-0a	Plagioclase	Pig 2	ISOTHERMAL	1150	1150	24	50.29	0.10	31.78	1.08	0.02	0.07	14.72	3.13	0.08	0.00	0.00	101.29	0.72
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 3	ISOTHERMAL	1150	1150	24	48.62	0.00	34.96	0.74	0.03	0.08	17.59	1.47	0.04	0.01	0.00	101.21	0.87
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 4	ISOTHERMAL	1150	1150	24	46.42	0.00	35.05	0.81	0.00	0.09	17.97	1.36	0.03	0.00	0.00	101.71	0.88
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 5	ISOTHERMAL	1150	1150	24	49.08	0.00	33.39	0.93	0.00	0.08	16.19	2.34	0.05	0.04	0.01	101.91	0.80
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 6	ISOTHERMAL	1150	1150	24	50.09	0.01	32.40	0.92	0.01	0.09	15.19	2.74	0.06	0.02	0.00	101.91	0.75
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 7	ISOTHERMAL	1150	1150	24	51.15	0.00	31.60	0.89	0.02	0.09	14.55	3.15	0.06	0.00	0.03	101.73	0.72
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 8	ISOTHERMAL	1150	1150	24	46.48	0.00	35.12	0.91	0.02	0.05	17.99	1.22	0.03	0.00	0.00	101.82	0.89
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 9	ISOTHERMAL	1150	1150	24	53.13	0.12	29.10	1.42	0.02	0.34	12.41	3.85	0.14	0.05	0.00	100.58	0.63
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 10	ISOTHERMAL	1150	1150	24	53.93	0.06	29.61	1.02	0.02	0.14	11.76	4.42	0.17	0.00	0.00	100.12	0.59
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 11	ISOTHERMAL	1150	1150	24	54.75	0.09	28.83	0.99	0.01	0.13	11.78	4.31	0.13	0.00	0.01	100.42	0.60
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 12	ISOTHERMAL	1150	1150	24	50.60	0.02	31.62	0.91	0.02	0.10	14.45	2.96	0.07	0.00	0.00	100.96	0.73
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 13	ISOTHERMAL	1150	1150	24	49.19	0.00	31.52	1.01	0.00	0.00	15.42	2.86	0.00	0.00	0.00	100.00	0.75
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 14	ISOTHERMAL	1150	1150	24	47.03	0.00	32.80	0.87	0.00	0.00	17.31	2.00	0.00	0.00	0.00	100.00	0.83
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 15	ISOTHERMAL	1150	1150	24	48.48	0.00	32.10	0.85	0.00	0.00	16.31	2.27	0.00	0.00	0.00	100.00	0.80
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 16	ISOTHERMAL	1150	1150	24	46.09	0.00	33.37	0.95	0.00	0.00	16.96	2.64	0.00	0.00	0.00	100.00	0.76
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 17	ISOTHERMAL	1150	1150	24	47.03	0.00	32.80	0.87	0.00	0.00	17.31	2.00	0.00	0.00	0.00	100.00	0.83
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 18	ISOTHERMAL	1150	1150	24	47.63	0.00	32.38	0.93	0.00	0.00	16.70	2.36	0.00	0.00	0.00	100.00	0.80
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 19	ISOTHERMAL	1150	1150	24	49.19	0.00	31.52	1.01	0.00	0.00	15.42	2.86	0.00	0.00	0.00	100.00	0.75
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 20	ISOTHERMAL	1150	1150	24	47.03	0.00	32.80	0.87	0.00	0.00	17.31	2.00	0.00	0.00	0.00	100.00	0.83
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 21	ISOTHERMAL	1150	1150	24	48.48	0.00	32.10	0.85	0.00	0.00	16.31	2.27	0.00	0.00	0.00	100.00	0.80
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 22	ISOTHERMAL	1150	1150	24	46.09	0.00	33.37	0.95	0.00	0.00	16.96	2.64	0.00	0.00	0.00	100.00	0.76
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 23	ISOTHERMAL	1150	1150	24	55.46	0.00	28.72	2.43	0.00	0.00	10.12	3.28	0.00	0.00	0.00	100.00	0.63
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 24	ISOTHERMAL	1150	1150	24	45.77	0.00	35.53	0.87	0.00	0.00	16.53	1.30	0.00	0.00	0.00	100.00	0.88
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 25	ISOTHERMAL	1150	1150	24	46.54	0.00	33.07	0.82	0.00	0.00	17.73	1.85	0.00	0.00	0.00	100.00	0.84
Aachen	WDS	No	-	G0-0a	Plagioclase	Pig 26	ISOTHERMAL	1150	1150	24	45.63	0.00	32.44	0.87	0.00	0.00	14.09	2.97	0.00	0.00	0.00	100.00	0.72
Average (felic cores)											47.12	0.00	32.85	0.87	0.00	0.00	16.21	2.34	0.00	0.00	0.00	0.79	0.79
1 sigma (felic cores)											1.45	0.00	1.14	0.09	0.00	0.00	1.17	0.55	0.00	0.00	0.00	0.04	0.04
Average (overgrowth)											45.11	0.02	33.08	0.91	0.02	0.08	15.83	2.38	0.06	0.01	0.00	0.78	0.78
1 sigma (overgrowth)											2.06	0.04	1.50	0.27	0.01	0.01	1.57	0.84	0.03	0.01	0.00	0.61	0.61
Average (felic cores)											53.14	0.09	28.85	1.14	0.01	0.20	11.90	4.19	0.14	0.02	0.00	0.82	0.82
1 sigma (felic cores)											0.24	0.07	0.20	0.07	0.01	0.02	0.02	0.02	0.02	0.00	0.00	0.61	0.61
Average (overgrowth)											53.22	0.26	29.84	1.89	0.04	0.49	10.79	3.56	0.24	0.04	0.00	0.82	0.82
1 sigma (overgrowth)											1.17	0.25	2.32	1.15	0.04	0.38	0.28	0.28	0.12	0.05	0.00	0.61	0.61
Leuven	EDS	No	-	G0-0b1	Plagioclase	Pig 1 core ?	ISOTHERMAL	1150	1150	24	57.17	0.23	26.34	1.95	0.03	0.41	9.17	4.53	0.26	0.00	0.00	100.34	0.50
Leuven	EDS	No	-	G0-0b2	Plagioclase	Pig 1 core ?	ISOTHERMAL	1150	1150	24	57.72	0.18	26.50	1.38	0.01	0.25	8.84	5.21	0.25	0.00	0.00	100.35	0.48
Leuven	EDS	No	-	G0-0b2	Plagioclase	Pig 2 core	ISOTHERMAL	1150	1150	24	55.48	0.13	26.01	1.42	0.01	0.16	10.04	4.83	0.22	0.00	0.00	100.31	0.53
Leuven	EDS	No	-	G0-0b2	Plagioclase	Pig 3 core	ISOTHERMAL	1150	1150	24	56.94	0.00	21.29	6.57	0.16	0.90	7.77	3.87	0.62	0.17	0.00	100.30	0.50
Leuven	EDS	No	-	G0-0b2	Plagioclase	Pig 4 core	ISOTHERMAL	1150	1150	24	54.75	0.15	28.22	1.59	0.04	0.28	10.85	4.22	0.21	0.03	0.00	100.35	0.58
Leuven	EDS	No	-	G0-0b2	Plagioclase	Pig 5 core ?	ISOTHERMAL	1150	1150	24	57.27	0.18	26.01	1.42	0.01	0.16	10.04	4.83	0.22	0.00	0.00	100.31	0.53
Leuven	EDS	No	-	G0-0b2	Plagioclase	Pig 6 core ?	ISOTHERMAL	1150	1150	24	46.86	0.03	34.96	1.10	0.01	0.08	15.71	1.43	0.01	0.00	0.03	100.95	0.82
Average (overgrowth)											56.55	0.45	25.15	3.32	0.07	0.88	9.05	4.40	0.38	0.07	0.00	0.52	0.52
1 sigma (overgrowth)											1.17	0.47	3.97	2.76	0.07	0.94	1.26	0.71	0.22	0.08	0.00	0.04	0.04
Leuven	EDS	No	-	G0-0b3	Plagioclase	Pig 1 core	ISOTHERMAL	1150	1150	24	49.08	0.00	32.02	1.06	0.00	0.00	16.31	2.73	0.12	0.00	0.00	99.94	0.74
Leuven	EDS	No	-	G0-0b3	Plagioclase	Pig 2 core	ISOTHERMAL	1150	1150	24	50.60	0.10	32										

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Aschen	WDS	Total too low	No	G5-3	Plagioclase	plg 10	125	1950	1950	0.1	53.65	0.07	25.40	1.09	0.03	0.13	3.71	5.60	0.18	0.05	0.00	95.91	0.48
Aschen	WDS	Total too low	No	G5-3	Plagioclase	plg 11	125	1950	1950	0.1	54.69	0.10	24.92	1.17	0.00	0.18	3.12	5.70	0.17	0.05	0.00	96.08	0.46
Leuven	EDS		No	G5-3	Plagioclase	plg 12	125	1950	1950	0.1	57.61	0.19	25.47	1.67	0.01	0.31	5.43	6.23	0.30	0.03	0.00	100.34	0.47
Leuven	EDS		No	G5-3	Plagioclase	plg 12	125	1950	1950	0.1	56.81	0.19	25.52	1.80	0.01	0.20	8.61	5.71	0.27	0.03	0.00	100.34	0.45
Leuven	EDS		No	G5-3	Plagioclase	plg 12	125	1950	1950	0.1	57.16	0.17	26.42	1.76	0.03	0.21	3.23	5.14	0.24	0.04	0.00	100.41	0.49
Leuven	EDS		No	G5-3	Plagioclase	plg 13	125	1950	1950	0.1	54.69	0.23	27.37	2.18	0.04	0.43	10.88	4.25	0.28	0.04	0.00	100.31	0.57
Leuven	EDS		No	G5-3	Plagioclase	plg 14	125	1950	1950	0.1	58.51	1.85	19.54	12.33	0.27	0.10	4.87	2.30	1.25	0.31	0.00	100.34	0.46
Leuven	EDS		No	G5-3	Plagioclase	plg 14	125	1950	1950	0.1	58.32	0.19	25.62	1.65	0.03	0.20	8.27	5.71	0.28	0.05	0.00	100.33	0.44
Leuven	EDS		No	G5-3	Plagioclase	plg 15	125	1950	1950	0.1	51.94	1.47	26.37	3.96	0.21	0.56	3.86	3.87	0.21	0.09	100.32	0.41	
Leuven	EDS		No	G5-3	Plagioclase	plg 16	125	1950	1950	0.1	53.82	0.32	23.88	2.42	0.03	0.37	6.38	6.03	0.42	0.04	0.00	100.32	0.38
Leuven	EDS		No	G5-3	Plagioclase	plg 16	125	1950	1950	0.1	58.41	0.22	25.17	2.09	0.03	0.34	8.35	5.33	0.31	0.05	0.00	100.37	0.45
Leuven	EDS		No	G5-3	Plagioclase	plg 17	125	1950	1950	0.1	53.10	0.19	24.80	1.90	0.01	0.25	7.56	6.18	0.25	0.23	0.00	100.48	0.37
Leuven	EDS		No	G5-3	Plagioclase	plg 17	125	1950	1950	0.1	59.41	0.72	21.21	4.77	0.07	0.128	7.10	5.13	0.56	0.10	0.00	100.36	0.42
Leuven	EDS		No	G5-3	Plagioclase	plg 17	125	1950	1950	0.1	53.38	0.70	21.39	4.51	0.03	0.16	6.88	5.57	0.56	0.03	0.00	100.35	0.39
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	58.08	0.35	23.85	1.86	0.01	0.22	8.15	5.93	0.28	0.06	0.00	100.33	0.43
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	58.08	0.30	24.30	2.42	0.03	0.44	8.28	5.50	0.43	0.06	0.00	100.34	0.44
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	1.47	0.21	2.00	1.12	0.02	0.29	1.14	0.59	0.30	0.06	0.00	100.33	0.46
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	53.32	0.09	25.46	1.25	0.02	0.19	10.08	5.54	0.19	0.03	0.00	100.33	0.50
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	1.11	0.02	1.04	0.14	0.02	0.08	0.07	0.04	0.02	0.02	0.00	100.33	0.43
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	44.75	0.01	32.42	0.84	0.03	0.09	17.15	1.95	0.04	0.00	0.01	100.33	0.63
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	1.01	0.01	0.97	0.10	0.02	0.02	1.04	0.02	0.02	0.02	0.00	100.33	0.43
Leuven	EDS		No	G5-3	Plagioclase	plg 18	125	1950	1950	0.1	51.87	0.05	28.32	1.02	0.04	0.05	12.21	4.45	0.13	0.01	0.00	98.21	0.60
Aschen	WDS		1450 C, 2 hours	G1-1	Plagioclase	plg 1	1	1950	1950	0.1	51.00	0.05	27.78	1.02	0.00	0.13	11.94	4.52	0.13	0.01	0.00	96.59	0.59
Aschen	WDS		1450 C, 2 hours	G1-1	Plagioclase	plg 2	1	1950	1950	0.1	50.62	0.05	27.63	1.00	0.00	0.13	12.15	4.51	0.13	0.01	0.01	96.24	0.59
Aschen	WDS		1450 C, 2 hours	G1-1	Plagioclase	plg 3	1	1950	1950	0.1	50.87	0.05	27.70	1.10	0.00	0.12	12.05	4.56	0.13	0.07	0.00	96.65	0.59
Aschen	WDS		1450 C, 2 hours	G1-1	Plagioclase	plg 4	1	1950	1950	0.1	51.02	0.06	28.04	1.11	0.04	0.14	12.38	4.22	0.13	0.01	0.00	97.13	0.61
Aschen	WDS		1450 C, 2 hours	G1-1	Plagioclase	plg 5	1	1950	1950	0.1	51.43	0.01	28.68	0.99	0.05	0.09	11.95	4.49	0.11	0.01	0.00	99.62	0.59
Aschen	WDS		1450 C, 2 hours	G1-1	Plagioclase	plg 7	1	1950	1950	0.1	51.08	0.04	28.42	1.10	0.03	0.13	11.93	4.47	0.16	0.00	0.02	99.38	0.59
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 9	1	1950	1950	0.1	53.23	0.15	28.44	1.50	0.01	0.11	12.78	3.88	0.22	0.00	0.00	100.33	0.64
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 9	1	1950	1950	0.1	53.47	0.19	28.47	1.49	0.01	0.11	12.46	4.02	0.21	0.00	0.00	100.33	0.64
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 10	1	1950	1950	0.1	53.84	0.11	28.47	1.43	0.01	0.11	11.97	4.21	0.20	0.00	0.00	100.36	0.62
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	53.47	0.19	28.45	1.52	0.01	0.13	12.39	4.05	0.20	0.00	0.00	100.41	0.62
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	55.30	0.11	28.45	1.52	0.01	0.13	12.39	4.05	0.20	0.00	0.00	100.41	0.62
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	55.30	0.11	28.45	1.52	0.01	0.13	12.39	4.05	0.20	0.00	0.00	100.41	0.62
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	51.70	0.04	28.08	1.05	0.02	0.12	12.09	4.46	0.13	0.01	0.00	98.60	0.60
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	1.14	0.02	0.40	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.00	100.33	0.43
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	53.50	0.14	28.46	1.49	0.01	0.12	12.40	4.04	0.21	0.00	0.00	100.33	0.62
Leuven	EDS		1450 C, 2 hours	G1-1	Plagioclase	plg 12	1	1950	1950	0.1	0.25	0.02	0.02	0.04	0.00	0.01	0.33	0.14	0.01	0.00	0.00	100.33	0.62
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 1	1	1950	1950	0.1	52.13	0.01	27.23	1.04	0.01	0.11	11.30	4.85	0.10	0.00	0.00	96.84	0.56
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 2	1	1950	1950	0.1	52.32	0.02	27.41	0.95	0.03	0.10	11.40	4.87	0.16	0.00	0.07	97.31	0.56
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 3	1	1950	1950	0.1	52.58	0.05	28.33	0.94	0.06	0.11	11.19	4.95	0.16	0.00	0.00	96.96	0.55
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 4	1	1950	1950	0.1	51.85	0.05	27.63	1.05	0.00	0.13	11.47	4.94	0.15	0.00	0.00	96.84	0.56
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 5	1	1950	1950	0.1	51.63	0.05	27.13	1.30	0.01	0.12	11.59	4.80	0.16	0.03	0.00	96.82	0.57
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 6	1	1950	1950	0.1	51.33	0.03	27.74	1.02	0.00	0.13	12.10	4.81	0.15	0.02	0.01	97.14	0.59
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 7	1	1950	1950	0.1	51.24	0.05	28.10	1.08	0.01	0.12	12.03	4.83	0.15	0.06	0.00	97.21	0.56
Aschen	WDS		1450 C, 2 hours	G1-2	Plagioclase	plg 9	1	1950	1950	0.1	52.40	0.09	27.66	1.03	0.02	0.13	11.37	4.83	0.17	0.00	0.00	97.68	0.56
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 9	1	1950	1950	0.1	54.62	0.11	27.72	1.57	0.01	0.11	11.46	4.49	0.21	0.00	0.00	100.31	0.58
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 9	1	1950	1950	0.1	54.73	0.15	28.10	1.62	0.01	0.12	12.05	4.25	0.21	0.00	0.00	100.33	0.58
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 10	1	1950	1950	0.1	54.19	0.12	28.01	1.52	0.01	0.12	11.77	4.34	0.21	0.06	0.04	100.40	0.59
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 10	1	1950	1950	0.1	54.30	0.11	28.10	1.38	0.01	0.13	11.88	4.27	0.22	0.00	0.00	100.39	0.60
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 11	1	1950	1950	0.1	54.13	0.11	28.13	1.45	0.01	0.13	11.73	4.27	0.21	0.00	0.00	100.33	0.60
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 11	1	1950	1950	0.1	54.20	0.11	27.97	1.57	0.01	0.13	11.88	4.23	0.22	0.00	0.00	100.33	0.60
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 12	1	1950	1950	0.1	54.27	0.11	27.78	1.69	0.01	0.13	11.74	4.34	0.23	0.00	0.00	100.33	0.59
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 12	1	1950	1950	0.1	54.31	0.11	27.93	1.48	0.01	0.13	11.77	4.22	0.22	0.00	0.00	100.33	0.59
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 13	1	1950	1950	0.1	53.95	0.18	28.16	1.73	0.05	0.15	12.19	4.89	0.24	0.00	0.00	100.35	0.61
Leuven	EDS		1450 C, 2 hours	G1-2	Plagioclase	plg 13	1	1950	1950	0.1	54.66	0.11	27.74	1.52	0.05	0.12	11.56	4.43	0.22	0.00	0.00	100.42	0.58
Leuven	EDS		1450 C, 2 hours</																				

Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 12	25	1550	1000	0.1	55.39	0.11	26.68	1.31	0.00	0.18	10.08	5.39	0.19	0.00	0.01	99.92	0.50
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 13	25	1550	1000	0.1	56.93	0.11	26.12	1.22	0.01	0.22	9.88	5.14	0.21	0.02	0.00	99.85	0.51
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 14	25	1550	1000	0.1	56.63	0.12	27.46	1.16	0.03	0.27	9.36	5.18	0.21	0.06	0.00	100.02	0.51
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 15	25	1550	1000	0.1	56.72	0.19	25.43	1.52	0.05	0.39	9.78	5.17	0.23	0.01	0.04	99.92	0.50
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 16	25	1550	1000	0.1	56.08	0.16	26.23	1.36	0.01	0.25	10.25	5.21	0.18	0.11	0.00	99.83	0.52
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 17	25	1550	1000	0.1	56.14	0.50	25.30	1.50	0.00	0.26	10.18	5.06	0.22	0.08	0.00	100.87	0.52
Aschen	WDS	glass contamination ?	G3-2	Plagioclase	Pig 18	25	1550	1000	0.1	56.87	1.44	16.34	3.96	0.17	0.07	6.10	2.61	0.96	0.25	0.02	96.38	0.51
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 19	25	1550	1000	0.1	55.32	0.06	27.23	1.32	0.00	0.15	10.66	5.05	0.17	0.00	0.02	99.98	0.53
Aschen	WDS	1450 C 2 hours	G3-2	Plagioclase	Pig 20	25	1550	1000	0.1	55.17	0.06	26.97	1.26	0.00	0.14	10.50	5.23	0.17	0.04	0.00	99.54	0.52
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 21	25	1550	1000	0.1	57.80	0.56	22.81	3.98	0.10	1.01	8.88	4.70	0.46	0.10	0.00	100.41	0.50
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 21	25	1550	1000	0.1	56.61	0.17	26.48	1.73	0.01	0.15	10.00	4.99	0.25	0.00	0.00	100.40	0.52
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 21	25	1550	1000	0.1	56.34	0.19	26.63	1.76	0.01	0.14	10.12	4.99	0.23	0.07	0.00	100.41	0.53
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 21	25	1550	1000	0.1	56.14	0.15	26.80	1.67	0.01	0.17	10.41	4.82	0.22	0.00	0.00	100.40	0.54
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 21	25	1550	1000	0.1	56.66	0.16	26.46	1.80	0.01	0.17	9.89	4.90	0.24	0.00	0.00	100.40	0.52
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 21	25	1550	1000	0.1	56.38	0.17	26.52	1.82	0.01	0.17	10.10	4.97	0.25	0.00	0.00	100.40	0.52
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 22	25	1550	1000	0.1	55.95	0.16	27.06	1.63	0.01	0.15	10.45	4.69	0.24	0.00	0.00	100.41	0.54
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 23	25	1550	1000	0.1	56.28	0.20	26.10	2.24	0.01	0.32	10.11	4.74	0.30	0.00	0.00	100.39	0.53
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 24	25	1550	1000	0.1	57.07	0.24	25.57	2.03	0.01	0.27	9.38	5.13	0.28	0.06	0.00	100.41	0.49
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 25	25	1550	1000	0.1	57.07	0.16	26.18	1.82	0.01	0.20	9.73	4.95	0.26	0.00	0.00	100.39	0.51
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 26	25	1550	1000	0.1	56.90	0.14	26.22	1.86	0.01	0.17	9.88	5.17	0.24	0.00	0.00	100.40	0.50
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 26	25	1550	1000	0.1	57.76	0.19	25.77	1.82	0.01	0.19	9.19	5.19	0.28	0.00	0.00	100.41	0.49
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 26	25	1550	1000	0.1	57.83	0.25	25.16	2.05	0.01	0.35	9.04	5.32	0.31	0.06	0.00	100.39	0.47
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 27	25	1550	1000	0.1	58.42	0.67	22.06	4.41	0.01	1.10	8.27	4.84	0.48	0.12	0.00	100.39	0.47
Leuven	EDS	1450 C 2 hours	G3-2	Plagioclase	Pig 28	25	1550	1000	0.1	57.18	0.17	25.95	1.86	0.01	0.20	9.63	5.11	0.27	0.00	0.00	100.38	0.50
Aschen	WDS	Average								55.85	0.16	25.97	1.55	0.03	0.34	10.08	5.08	0.22	0.04	0.01	0.52	
Aschen	WDS	1 sigma								0.73	0.06	1.0	0.46	0.07	0.22	0.04	0.06	0.04	0.01	0.01	0.02	
Aschen	WDS	1 sigma								56.38	0.24	25.71	2.10	0.02	0.32	9.67	4.96	0.23	0.03	0.00	100.40	0.51
Aschen	WDS	1 sigma								0.73	0.06	1.0	0.46	0.07	0.22	0.04	0.06	0.04	0.01	0.01	0.02	
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 1	25	1550	1050	0.1	56.57	0.09	26.95	1.28	0.01	0.16	9.71	5.23	0.22	0.02	0.01	99.82	0.50
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 2	25	1550	1050	0.1	56.31	0.07	27.37	1.02	0.05	0.16	9.46	5.14	0.19	0.04	0.00	100.61	0.52
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 3	25	1550	1050	0.1	57.22	0.04	26.83	1.20	0.03	0.15	9.95	5.13	0.27	0.04	0.01	100.46	0.50
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 4	25	1550	1050	0.1	56.43	0.19	26.43	1.25	0.01	0.17	10.30	5.20	0.22	0.05	0.00	100.42	0.52
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 5	25	1550	1050	0.1	56.02	0.14	26.98	1.23	0.03	0.20	9.57	5.36	0.23	0.03	0.00	101.77	0.49
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 6	25	1550	1050	0.1	56.24	0.07	27.66	1.14	0.02	0.15	10.29	4.76	0.21	0.03	0.01	100.58	0.54
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 7	25	1550	1050	0.1	56.58	0.17	26.58	1.14	0.03	0.17	10.43	4.95	0.17	0.01	0.00	101.14	0.54
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 8	25	1550	1050	0.1	57.64	0.13	27.22	1.14	0.03	0.15	9.71	5.27	0.23	0.05	0.01	101.57	0.50
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 9	25	1550	1050	0.1	57.89	0.15	26.76	1.10	0.04	0.19	9.38	4.90	0.24	0.00	0.00	100.63	0.51
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 10	25	1550	1050	0.1	56.82	0.12	26.82	1.14	0.03	0.18	10.22	4.92	0.22	0.00	0.00	100.41	0.49
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 11	25	1550	1050	0.1	56.47	0.27	24.50	1.98	0.04	0.10	9.06	4.89	0.38	0.08	0.00	100.37	0.49
Aschen	WDS	1450 C 2 hours	G3-3	Plagioclase	Pig 12	25	1550	1050	0.1	58.14	0.06	27.23	1.14	0.01	0.18	9.73	4.45	0.22	0.05	0.00	101.21	0.54
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 13	25	1550	1050	0.1	56.46	0.52	26.46	3.93	0.07	0.80	8.53	4.57	0.48	0.18	0.00	100.39	0.50
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 13	25	1550	1050	0.1	56.31	0.18	26.05	1.74	0.01	0.17	9.70	5.23	0.33	0.00	0.00	100.33	0.52
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 14	25	1550	1050	0.1	56.65	0.15	26.46	1.52	0.01	0.16	10.05	5.12	0.27	0.00	0.00	100.40	0.53
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 15	25	1550	1050	0.1	56.05	0.52	26.46	3.93	0.07	0.80	8.53	4.57	0.48	0.18	0.00	100.39	0.50
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 15	25	1550	1050	0.1	57.04	0.19	25.93	1.71	0.01	0.19	9.78	5.20	0.32	0.00	0.00	100.38	0.52
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 16	25	1550	1050	0.1	57.47	0.16	25.51	1.52	0.01	0.18	9.41	5.42	0.31	0.00	0.00	100.40	0.50
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 16	25	1550	1050	0.1	57.45	0.16	25.48	1.51	0.01	0.18	9.43	5.41	0.31	0.00	0.00	100.41	0.50
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 17	25	1550	1050	0.1	57.41	0.17	25.95	1.68	0.01	0.18	9.47	5.10	0.31	0.00	0.00	100.42	0.52
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 17	25	1550	1050	0.1	57.41	0.17	25.95	1.68	0.01	0.17	9.18	5.51	0.30	0.00	0.00	100.41	0.52
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 17	25	1550	1050	0.1	57.12	0.16	26.03	1.74	0.01	0.23	9.68	5.03	0.31	0.00	0.00	100.32	0.53
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 17	25	1550	1050	0.1	57.16	0.18	26.09	1.61	0.01	0.18	9.38	5.38	0.29	0.00	0.00	100.30	0.50
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 18	25	1550	1050	0.1	57.60	0.58	22.92	4.22	0.03	1.25	8.09	5.02	0.54	0.00	0.00	100.32	0.49
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 19	25	1550	1050	0.1	57.50	0.18	25.36	1.63	0.01	0.20	8.32	5.80	0.31	0.00	0.00	100.32	0.48
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 19	25	1550	1050	0.1	56.85	0.17	26.40	1.57	0.01	0.17	9.56	5.32	0.26	0.00	0.00	100.32	0.51
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 19	25	1550	1050	0.1	57.59	0.20	25.60	1.78	0.01	0.28	9.55	5.55	0.33	0.00	0.00	100.40	0.49
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 19	25	1550	1050	0.1	56.45	0.19	26.30	1.65	0.01	0.17	9.10	5.52	0.30	0.00	0.00	100.39	0.51
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 20	25	1550	1050	0.1	57.08	0.16	27.45	1.47	0.01	0.13	10.50	4.38	0.23	0.00	0.00	100.42	0.60
Leuven	EDS	1450 C 2 hours	G3-3	Plagioclase	Pig 21	25	1550	1050	0.1	56.36	0.32	26.07	1.07	0.01	0.27	4.77	3.30	0.07	0.00	0.00	100.41	0.55
Aschen	WDS	Average								56												

Aschen	WDS	No	G6-1	Plagioclase	Plg10	1	185	2	52.74	0.08	28.89	0.94	0.02	0.12	12.13	4.47	0.13	0.00	0.00	99.53	0.59
Aschen	WDS	No	G6-1	Plagioclase	Plg11	1	185	2	52.74	0.06	28.84	0.95	0.00	0.12	11.88	4.52	0.14	0.04	0.00	99.30	0.59
Aschen	WDS	No	G6-1	Plagioclase	Plg12	1	185	2	52.75	0.07	29.04	0.90	0.00	0.08	12.01	4.53	0.14	0.00	0.00	99.66	0.59
Average									52.64	0.06	28.74	0.88	0.01	0.12	12.12	4.53	0.13	0.01	0.01	0.53	
1 sigma									0.42	0.01	0.28	0.04	0.01	0.02	0.26	0.08	0.01	0.01	0.01		
Aschen	WDS	No	G6-2a1	Plagioclase	Plg1	1	185	5	52.86	0.02	29.97	0.90	0.05	0.14	12.16	4.57	0.13	0.04		99.74	0.59
Aschen	WDS	No	G6-2a1	Plagioclase	Plg2heart	1	185	5	46.71	0.02	31.13	0.86	0.00	0.12	14.32	3.22	0.07	0.01	0.01	95.06	0.72
Aschen	WDS	No	G6-2a1	Plagioclase	Plg2im	1	185	5	51.82	0.03	29.01	0.86	0.00	0.15	12.64	4.30	0.14	0.02	0.00	98.97	0.61
Aschen	WDS	No	G6-2a1	Plagioclase	Plg3	1	185	5	52.21	0.05	29.03	0.98	0.01	0.12	12.91	4.47	0.13	0.02	0.01	99.41	0.60
Aschen	WDS	No	G6-2a1	Plagioclase	Plg4	1	185	5	52.06	0.05	28.94	0.97	0.00	0.11	11.98	4.44	0.14	0.02	0.00	99.50	0.59
Aschen	WDS	No	G6-2a1	Plagioclase	Plg5	1	185	5	52.90	0.08	28.85	0.82	0.01	0.13	12.15	4.56	0.14	0.00	0.00	99.74	0.59
Aschen	WDS	No	G6-2a1	Plagioclase	Plg6	1	185	5	52.43	0.00	29.19	0.88	0.00	0.12	12.32	4.45	0.13	0.01	0.02	99.53	0.60
Aschen	WDS	No	G6-2a1	Plagioclase	Plg7	1	185	5	52.84	0.07	28.87	0.95	0.02	0.11	12.14	4.42	0.12	0.01	0.00	99.53	0.60
Aschen	WDS	No	G6-2a1	Plagioclase	Plg8	1	185	5	52.37	0.01	29.21	0.85	0.02	0.14	12.38	4.34	0.12	0.01	0.01	99.47	0.61
Aschen	WDS	No	G6-2a1	Plagioclase	Plg9	1	185	5	53.28	0.09	29.03	0.88	0.01	0.12	12.21	4.48	0.14	0.04	0.00	100.42	0.60
Aschen	WDS	No	G6-2a1	Plagioclase	Plg10	1	185	5	53.12	0.05	29.44	0.85	0.01	0.14	12.44	4.29	0.12	0.00	0.02	100.48	0.61
Aschen	WDS	No	G6-2a1	Plagioclase	Plg11	1	185	5	54.08	0.07	29.50	0.87	0.03	0.12	12.11	4.27	0.14	0.04	0.00	101.23	0.61
Average									52.80	0.04	29.11	0.90	0.01	0.13	12.26	4.42	0.13	0.02	0.01	0.60	
1 sigma									0.60	0.03	0.23	0.05	0.01	0.01	0.18	0.11	0.01	0.01	0.01	0.01	
Aschen	WDS	No	G6-2a2	Plagioclase	Plg1	1	185	5	52.39	0.01	29.38	0.86	0.00	0.12	12.33	4.26	0.12	0.00	0.00	100.05	0.61
Aschen	WDS	No	G6-2a2	Plagioclase	Plg2	1	185	5	52.63	0.07	29.12	0.76	0.02	0.11	12.44	4.37	0.12	0.03	0.00	99.87	0.61
Aschen	WDS	No	G6-2a2	Plagioclase	Plg3	1	185	5	51.63	0.04	28.68	0.82	0.00	0.13	12.35	4.52	0.13	0.03	0.00	98.39	0.60
Aschen	WDS	No	G6-2a2	Plagioclase	Plg4	1	185	5	51.54	0.03	28.54	0.89	0.01	0.14	12.11	4.51	0.17	0.00	0.00	97.95	0.59
Aschen	WDS	No	G6-2a2	Plagioclase	Plg5	1	185	5	52.39	0.09	28.97	0.88	0.00	0.15	12.16	4.67	0.16	0.04	0.00	99.11	0.58
Aschen	WDS	No	G6-2a2	Plagioclase	Plg6	1	185	5	52.33	0.03	28.56	0.92	0.07	0.12	11.96	4.53	0.13	0.01	0.01	98.66	0.59
Aschen	WDS	No	G6-2a2	Plagioclase	Plg7heart	1	185	5	46.05	0.00	32.38	0.88	0.02	0.09	16.82	2.17	0.04	0.05	0.00	98.49	0.91
Aschen	WDS	No	G6-2a2	Plagioclase	plg7im	1	185	5	51.38	0.06	28.62	0.83	0.02	0.12	12.40	4.51	0.13	0.01	0.02	98.08	0.60
Aschen	WDS	No	G6-2a2	Plagioclase	Plg8heart	1	185	5	54.38	0.00	31.61	0.75	0.03	0.08	15.48	2.81	0.08	0.02	0.00	98.23	0.75
Aschen	WDS	No	G6-2a2	Plagioclase	Plg8im	1	185	5	51.37	0.07	28.32	0.90	0.00	0.14	12.67	4.42	0.12	0.01	0.01	98.61	0.61
Average									52.37	0.05	29.04	0.85	0.01	0.13	12.33	4.47	0.13	0.02	0.01	0.60	
1 sigma									0.64	0.03	0.25	0.05	0.02	0.01	0.22	0.12	0.02	0.01	0.01	0.01	
Average (core part)									46.72	0.00	31.99	0.81	0.02	0.09	16.15	2.49	0.06	0.03	0.00	0.78	
1 sigma (core part)									0.24	0.00	0.57	0.01	0.00	0.04	0.29	0.42	0.02	0.01	0.00	0.00	
Aschen	WDS	No	G6-3	Plagioclase	Plg1	1	185	10	54.37	0.04	29.95	0.95	0.03	0.11	12.34	3.95	0.14	0.00	0.00	101.88	0.63
Aschen	WDS	No	G6-3	Plagioclase	Plg2	1	185	10	54.58	0.02	29.73	0.93	0.01	0.12	12.20	4.07	0.12	0.00	0.00	101.82	0.62
Aschen	WDS	No	G6-3	Plagioclase	Plg3	1	185	10	54.52	0.04	29.89	0.96	0.00	0.12	11.87	4.17	0.15	0.04	0.00	101.25	0.61
Aschen	WDS	No	G6-3	Plagioclase	Plg4	1	185	10	55.24	0.06	29.40	0.79	0.01	0.09	11.76	4.21	0.13	0.00	0.00	101.69	0.60
Aschen	WDS	No	G6-3	Plagioclase	Plg5	1	185	10	54.68	0.05	29.11	0.88	0.01	0.12	12.05	4.02	0.16	0.01	0.00	101.91	0.62
Aschen	WDS	No	G6-3	Plagioclase	Plg6	1	185	10	55.12	0.05	29.70	0.82	0.00	0.12	11.83	4.20	0.10	0.00	0.00	102.03	0.61
Aschen	WDS	No	G6-3	Plagioclase	Plg7	1	185	10	55.53	0.04	30.07	0.83	0.01	0.12	11.89	4.10	0.13	0.06	0.04	102.82	0.61
Aschen	WDS	No	G6-3	Plagioclase	Plg8heart	1	185	10	48.30	0.03	29.87	0.84	0.01	0.08	17.35	1.54	0.05	0.01	0.00	102.31	0.58
Aschen	WDS	No	G6-3	Plagioclase	Plg8im	1	185	10	55.67	0.03	29.69	0.76	0.00	0.11	11.75	4.21	0.13	0.02	0.01	102.36	0.60
Aschen	WDS	No	G6-3	Plagioclase	Plg9	1	185	10	55.71	0.02	29.77	0.87	0.01	0.10	11.79	4.16	0.16	0.00	0.00	102.59	0.60
Aschen	WDS	No	G6-3	Plagioclase	Plg10	1	185	10	54.93	0.08	29.33	0.94	0.01	0.10	11.82	4.25	0.12	0.00	0.00	101.82	0.58
Aschen	WDS	No	G6-3	Plagioclase	Plg11	1	185	10	54.91	0.04	29.37	0.81	0.00	0.09	11.89	4.30	0.16	0.02	0.00	101.37	0.59
Aschen	WDS	No	G6-3	Plagioclase	Plg12	1	185	10	54.41	0.03	29.76	0.85	0.01	0.12	12.11	4.03	0.14	0.03	0.03	101.52	0.62
Average									54.37	0.05	29.70	0.88	0.01	0.10	11.93	4.14	0.14	0.01	0.01	0.61	
1 sigma									0.48	0.02	0.21	0.01	0.01	0.02	0.21	0.11	0.02	0.02	0.01	0.01	
Average (core part)									46.72	0.00	31.99	0.81	0.02	0.09	16.15	2.49	0.06	0.03	0.00	0.78	
1 sigma (core part)									0.24	0.00	0.57	0.01	0.00	0.04	0.29	0.42	0.02	0.01	0.00	0.00	
Aschen	WDS	No	G6-4	Plagioclase	Plg1	1	185	24	54.19	0.05	30.01	0.84	0.03	0.11	12.48	3.95	0.11	0.00	0.00	101.76	0.63
Aschen	WDS	No	G6-4	Plagioclase	Plg2	1	185	24	54.15	0.02	29.71	0.86	0.02	0.11	11.96	4.23	0.14	0.05	0.00	101.27	0.61
Aschen	WDS	No	G6-4	Plagioclase	Plg3	1	185	24	54.18	0.03	29.34	0.88	0.00	0.13	12.11	4.25	0.15	0.01	0.03	101.11	0.61
Aschen	WDS	No	G6-4	Plagioclase	Plg4	1	185	24	53.81	0.07	29.28	0.84	0.02	0.10	12.04	4.27	0.14	0.04	0.00	100.60	0.60
Aschen	WDS	No	G6-4	Plagioclase	Plg5	1	185	24	54.01	0.05	29.35	0.83	0.02	0.11	12.18	4.29	0.13	0.02	0.01	101.01	0.61
Aschen	WDS	No	G6-4	Plagioclase	Plg6	1	185	24	53.95	0.06	29.21	0.93	0.04	0.09	12.11	4.22	0.15	0.03	0.00	100.78	0.61
Aschen	WDS	No	G6-4	Plagioclase	Plg7	1	185	24	53.77	0.08	29.42	0.83	0.03	0.11	12.51	4.19	0.13	0.03	0.00	101.08	0.62
Aschen	WDS	No	G6-4	Plagioclase	Plg8	1	185	24	53.67	0.07	29.56	0.80	0.01	0.09	12.24	4.31	0.12	0.02	0.00	100.89	0.61
Aschen	WDS	No	G6-4	Plagioclase	Plg9	1	185	24	53.58	0.03	29.83	0.93	0.05	0.12	11.95	4.41	0.13	0.04	0.00	101.24	0.60
Aschen	WDS	No	G6-4	Plagioclase	Plg10	1	185	24	53.59	0.05	29.03	0.90	0.02	0.12	11.97	4.24	0.14	0.02	0.00	100.08	0.60
Aschen	WDS	No	G6-4	Plagioclase	Plg11	1	185	24	53.72	0.09	29.00	0.82	0.04	0.11	11.99	4.31	0.13	0.07	0.00	100.38	0.60
Aschen	WDS	No	G6-4	Plagioclase	Plg12	1	185	24	53.65	0.10	28.65	0.81	0.03	0.10	11.82	4.32	0.14	0.00	0.00	99.99	0.59
Aschen	WDS	No	G6-4	Plagioclase</																	

Aachen	WDS	No	G6-11	Plagioclase	Plg6	9	1865	24	52.82	0.10	28.46	0.99	0.04	0.10	11.90	4.48	0.15	0.03	0.00	99.06	0.59
Aachen	WDS	No	G6-11	Plagioclase	Plg7	9	1865	24	53.22	0.10	28.51	0.99	0.02	0.10	11.61	4.54	0.15	0.04	0.02	99.29	0.58
Aachen	WDS	No	G6-11	Plagioclase	Plg8	9	1865	24	52.56	0.02	23.03	0.90	0.03	0.12	12.36	4.32	0.11	0.00	0.00	99.45	0.61
Aachen	WDS	No	G6-11	Plagioclase	Plg9	9	1865	24	46.09	0.00	33.97	0.77	0.00	0.10	17.10	1.85	0.02	0.03	0.00	100.00	0.86
Aachen	WDS	No	G6-11	Plagioclase	Plg10	9	1865	24	53.28	0.02	28.78	0.85	0.03	0.12	11.95	4.41	0.16	0.01	0.00	99.58	0.59
Aachen	WDS	No	G6-11	Plagioclase	Plg11	9	1865	24	53.28	0.10	28.75	0.82	0.00	0.13	11.95	4.55	0.13	0.01	0.00	99.69	0.59
Aachen	WDS	No	G6-11	Plagioclase	Plg12	9	1865	24	53.58	0.05	29.51	0.93	0.00	0.13	11.58	4.57	0.14	0.00	0.00	99.56	0.58
Aachen	WDS	No	G6-11	Plagioclase	Plg13	9	1865	24	52.95	0.05	28.74	0.99	0.01	0.13	11.69	4.60	0.14	0.02	0.02	99.52	0.58
Aachen	WDS	No	G6-11	Plagioclase	Plg14	9	1865	24	53.17	0.02	28.67	0.92	0.06	0.11	11.61	4.60	0.15	0.02	0.00	99.52	0.58
Aachen	WDS	No	G6-11	Plagioclase	Plg15	9	1865	24	52.72	0.09	28.65	0.90	0.01	0.13	12.05	4.29	0.14	0.03	0.00	99.20	0.60
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	Pre-treatment	Type	CR (°C/h)	t final step (h)	Ti (°C)	Tf (°C)	delta Tn (°C)	WDS		EDS	
								An content	1 sigma	An content	1 sigma
	No	ISO	-	24	1200	1200	-25	0,85	0,02	-	-
Rim	No	ISO	-	24	1190	1190	-15	0,61	0,02	-	-
Core				24	1190	1190	-15	0,78	0,08	0,79	0,05
Rim	No	ISO	-	24	1190	1190	-15	-	-	0,62	0,01
Rim	No	ISO	-	24	1190	1190	-15	-	-	0,52	0,04
Core	No	ISO	-	24	1190	1190	-15	-	-	0,7	0,03
	No	ISO	-	24	1185	1185	-10	-	-	0,65	0,05
	No	ISO	-	24	1180	1180	-5	0,61	0,03	0,66	0,02
Core	No	ISO	-	24	1175	1175	0	0,74	0,02	-	-
Rim				24	1175	1175	0	0,59	0,03	0,64	0,01
	No	ISO	-	24	1150	1150	25	-	-	0,53	0,04
	1450 °C, 2h	ISO	-	24	1170	1170	5	0,60	0,03	-	-
	1450 °C, 2h	ISO	-	24	1160	1160	15	0,59	0,01	-	-
	1450 °C, 2h	ISO	-	24	1150	1150	25	0,60	0,02	0,59	0,01
Rim	No	CR	1	0,1	1190	1165	10	0,62	0,01	-	-
Core			1	0,1	1190	1165	10	0,75	0,02	-	-
Rim			1	0,1	1190	1165	10	0,62	0,01	-	-
Core			1	0,1	1190	1165	10	0,75	0,01	-	-
Rim	No	CR	1	0,1	1190	1137	38	0,57	0,02	-	-
Core			1	0,1	1190	1137	38	0,83	0,05	-	-
Rim	No	CR	1	0,1	1190	1120	55	0,60	0,01	-	-
Core			1	0,1	1190	1120	55	0,85	0,02	-	-
Rim	No	CR	1	0,1	1190	1100	75	0,56	0,03	-	-
Core			1	0,1	1190	1100	75	0,82	0,06	-	-
Rim	No	CR	9	0,1	1190	1165	10	0,61	0,01	-	-
Core			9	0,1	1190	1165	10	0,77	0,05	-	-
Rim	No	CR	9	0,1	1190	1140	35	0,58	0,01	-	-
Core			9	0,1	1190	1140	35	0,84	0,07	-	-
Rim	No	CR	9	0,1	1190	1140	35	0,56	0,03	-	-
Core			9	0,1	1190	1140	35	0,83	0,07	-	-
Rim	No	CR	9	0,1	1190	1120	55	0,55	0,03	-	-
Core			9	0,1	1190	1120	55	0,78	0,06	-	-
Rim	No	CR	9	0,1	1190	1120	55	0,57	0,02	-	-
Core			9	0,1	1190	1120	55	0,79	0,09	-	-
Rim	No	CR	9	0,1	1190	1100	75	0,55	0,01	-	-
Core			9	0,1	1190	1100	75	0,80	0,05	-	-
Rim	No	CR	9	0,1	1190	1050	125	0,55	0,04	-	-
Rim	No	CR	9	0,1	1190	1000	175	0,59	0,05	-	-
Rim	No	CR	25	0,1	1190	1165	10	0,63	0,03	-	-
Core				0,1	1190	1165	10	0,76	0,03	-	-
Rim	No	CR	25	0,1	1190	1100	75	0,55	0,04	0,53	0,03
Core				0,1	1190	1100	75	0,79	0,06	-	-
Rim	No	CR	25	0,1	1190	1050	125	0,51	0,02	-	-
Core			125	0,1	1190	1165	-27,5	0,82	0,02	-	-
Rim	No	CR	125	0,1	1190	1100	37,5	0,50	0,05	0,58	0,06
Rim	No	CR	125	0,1	1190	1100	37,5	0,54	0,04	0,5	0,03
Core				0,1	1190	1100	37,5	0,81	0,01	-	-
Rim	No	CR	125	0,1	1190	1050	87,5	0,50	0,04	0,44	0,06
Core				0,1	1190	1050	87,5	0,83	0,06	-	-
	1450 °C, 2h	CR	1	0,1	1190	1165	10	0,60	0,01	0,62	0,01
	1450 °C, 2h	CR	1	0,1	1190	1140	35	0,56	0,01	0,6	0,01
	1450 °C, 2h	CR	1	0,1	1190	1120	55	0,58	0,01	0,6	0,01
	1450 °C, 2h	CR	1	0,1	1190	1100	75	0,57	0,01	0,58	0,03
	1450 °C, 2h	CR	9	0,1	1190	1050	125	0,49	0,03	-	-
	1450 °C, 2h	CR	9	0,1	1190	1000	175	0,54	0,03	0,49	0,02
	1450 °C, 2h	CR	25	0,1	1190	1100	10	0,52	0,02	0,51	0,02
	1450 °C, 2h	CR	25	0,1	1190	1050	60	0,51	0,02	0,51	0,03
	1210 °C, 24h	CR	1	0,1	1210	1140	5	0,56	0,01	-	-
	1210 °C, 24h	CR	1	0,1	1210	1130	15	0,54	0,01	-	-
	1210 °C, 24h	CR	1	0,1	1210	1120	25	0,55	0,01	-	-
	1210 °C, 24h	CR	1	0,1	1210	1100	45	0,55	0,02	-	-
	1230 °C, 24h	CR	1	0,1	1230	1100	45	0,55	0,01	-	-
Rim	No	CR + ISO	1	2	1190	1165	10	0,59	0,01	-	-
Rim	No	CR + ISO	1	5	1190	1165	10	0,6	0,01	-	-
Rim	No	CR + ISO	1	5	1190	1165	10	0,6	0,01	-	-
Core	No	CR + ISO	1		1190	1165	10	0,78	0,04	-	-
Rim	No	CR + ISO	1	10	1190	1165	10	0,61	0,01	-	-
Rim	No	CR + ISO	1	24	1190	1165	10	0,61	0,01	-	-
Rim	No	CR + ISO	1	2	1190	1120	55	0,58	0,02	-	-
Core	No	CR + ISO	1		1190	1120	55	0,82	0,01	-	-
Rim	No	CR + ISO	1	5	1190	1120	55	0,59	0,01	-	-
Rim	No	CR + ISO	1	10	1190	1120	55	0,59	0,02	-	-
Rim	No	CR + ISO	1	24	1190	1120	55	0,6	0,02	-	-
Rim	No	CR + ISO	1	240	1190	1120	55	0,58	0,01	-	-
Rim	No	CR + ISO	9	5	1190	1165	10	0,59	0,02	-	-
Rim	No	CR + ISO	9	24	1190	1165	10	0,59	0,01	-	-
Core	No	CR + ISO	9		1190	1165	10	0,82	0,05	-	-
Rim	No	CR + ISO	9	10	1190	1120		0,53	0,02	-	-
Rim	No	CR + ISO	9	264	1190	1120		-	-	0,49	0,02
Rim	No	CR + ISO	9	384	1190	1120		-	-	0,49	0,01
Rim	No	CR + ISO	9	744	1190	1120		-	-	0,48	0,02
Rim	No	CR + ISO	9	744	1190	1120		-	-	0,47	0,02
Rim	No	CR + ISO	1	24	1210	1120		-	-	0,54	0,01

OTHER MINERALS

														chemical analysis (wt. %)													
EDS/WD	Place	Initial Pre-heating	Sample	Observations	Phase	position	Cooling rate (°C/h)	T1 (°C)	T2 (°C)	final step (h)	SiO ₂	TiO ₂	Al ₂ O ₃	FeO _{tot}	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Cu ₂ O	MO	P _h	Total			
EDS	Leuven	No (seed-bearing)	G-3	-	-	-	ISO	1175	1175	24	0.00	0.00	20.33	2.88	0.00	1.05	4.58	0.89	1.24	0.00	0.00	0.00	0.00	88.61	93.93		
	Leuven	No (seed-bearing)	G-3	-	-	-	ISO	1175	1175	24	0.00	0.00	16.30	0.00	0.00	0.67	6.85	0.00	0.75	0.00	0.74	0.00	74.06	100.00			
	Leuven	No (seed-bearing)	G-3	-	-	-	ISO	1175	1175	24	0.00	0.00	16.30	0.00	0.00	0.86	0.00	0.96	0.00	0.00	0.00	0.00	81.63	100.00			
	Leuven	No (seed-bearing)	G-5	Magnetite	-	-	-	ISO	1150	1150	24	0.00	6.07	5.18	83.79	0.35	4.01	0.15	0.17	0.00	0.00	0.00	0.00	93.93			
	Leuven	No (seed-bearing)	G-5	Magnetite	-	-	-	ISO	1150	1150	24	0.25	6.09	5.20	83.50	0.32	4.15	0.13	0.18	0.00	0.08	0.09	0.00	0.00	93.93		
EDS	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.45	5.62	7.75	83.58	0.32	3.56	0.23	0.00	0.00	0.00	0.00	0.00	0.00	100.01		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.40	5.73	7.62	82.24	0.28	3.43	0.19	0.00	0.00	0.00	0.00	0.00	0.00	100.01		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.69	5.72	7.57	81.52	0.31	3.42	0.23	0.00	0.00	0.00	0.06	0.08	0.00	100.00		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.33	5.71	7.58	82.32	0.29	3.54	0.16	0.00	0.00	0.00	0.06	0.00	0.00	93.93		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.22	5.70	7.69	81.89	0.31	3.55	0.22	0.00	0.00	0.00	0.09	0.00	0.00	100.00		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.33	5.72	7.58	82.27	0.31	3.49	0.17	0.00	0.03	0.00	0.11	0.00	0.00	100.01		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.84	5.62	7.74	81.35	0.33	3.56	0.35	0.00	0.04	0.07	0.11	0.00	0.00	100.01		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.40	5.63	7.69	82.13	0.23	3.52	0.21	0.00	0.00	0.00	0.11	0.00	0.00	93.93		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	1.34	5.55	7.71	80.99	0.32	3.55	0.40	0.00	0.05	0.00	0.09	0.00	0.00	100.00		
	Leuven	1450 C 2h (No seed)	G-10	Magnetite	-	-	-	ISO	1160	1160	24	0.63	5.67	7.72	81.73	0.31	3.52	0.18	0.00	0.03	0.00	0.13	0.00	0.00	100.00		
	Leuven	1450 C 2h (No seed)	G-10	Spiral	-	-	-	ISO	1160	1160	24	0.20	0.17	59.24	27.11	0.24	12.91	0.09	0.00	0.03	0.00	0.00	0.00	0.00	93.93		
	Leuven	1450 C 2h (No seed)	G-10	Spiral	-	-	-	ISO	1160	1160	24	0.26	0.14	60.64	25.55	0.22	13.10	0.09	0.00	0.00	0.00	0.00	0.00	0.00	100.00		
	Leuven	1450 C 2h (No seed)	G-10	Al impurity	-	-	-	ISO	1160	1160	24	0.15	0.00	99.36	0.36	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	100.00		
	Leuven	1450 C 2h (No seed)	G-10	Al impurity	-	-	-	ISO	1160	1160	24	0.14	0.05	99.33	0.40	0.00	0.00	0.00	0.03	0.00	0.05	0.00	0.00	0.00	100.00		
	Bilzon et al. 2025	Leuven	No (seed-bearing)	G-13	Magnetite	-	-	-	1	1150	1120	0	0.00	5.35	8.66	81.34	0.00	4.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	
Leuven		No (seed-bearing)	G-13	Magnetite	-	-	-	1	1150	1120	0	0.00	5.00	9.37	73.60	0.00	5.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00		
Leuven		No (seed-bearing)	G-13	Magnetite	-	-	-	1	1150	1120	0	0.00	4.27	2.66	90.54	0.00	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00		
Leuven		No (seed-bearing)	G-13	Magnetite	-	-	-	1	1150	1120	0	0.00	6.75	7.38	84.36	0.00	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00		
Leuven		No (seed-bearing)	G-13	traces in order	Magnetite	-	-	1	1150	1120	0	0.00	4.23	12.40	77.27	0.00	9.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	
WDs		Aachen	No (seed-bearing)	G-13	Sample edge	Magnetite	-	-	1	1150	1120	0	0.15	4.47	4.23	75.12	0.33	5.20	0.00	0.00	0.00	0.00	0.48	0.05	0.00	90.09	
WDs		Aachen	No (seed-bearing)	G-13	Sample edge	Magnetite	-	-	1	1150	1120	0	0.19	4.34	4.28	74.46	0.39	5.27	0.00	0.00	0.00	0.00	0.34	0.03	0.00	89.23	
WDs		Aachen	No (seed-bearing)	G-13	Sample edge	Magnetite	-	-	1	1150	1120	0	0.20	4.48	4.28	74.50	0.41	5.62	0.00	0.00	0.00	0.00	0.16	0.06	0.00	89.71	
WDs		Aachen	No (seed-bearing)	G-13	evolution	Magnetite	-	-	1	1150	1120	0	0.24	6.04	2.93	74.75	0.14	2.38	0.00	0.00	0.00	0.00	0.09	0.04	0.00	86.06	
WDs		Aachen	No (seed-bearing)	G-13	Sample edge	Magnetite	-	-	1	1150	1120	0	0.15	4.00	4.36	74.27	0.42	5.91	0.00	0.00	0.00	0.00	0.98	0.08	0.00	90.27	
WDs		Aachen	No (seed-bearing)	G-13	Sample edge	Magnetite	-	-	1	1150	1120	0	0.32	4.26	4.45	73.82	0.41	5.13	0.00	0.00	0.00	0.00	0.70	0.01	0.00	83.86	
WDs		Aachen	No (seed-bearing)	G-13	Sample edge	Magnetite	-	-	1	1150	1120	0	0.15	4.51	4.57	74.23	0.38	5.28	0.00	0.00	0.00	0.00	0.89	0.05	0.00	90.03	
WDs		Aachen	No (seed-bearing)	G-13	Sample heart	Magnetite	-	-	1	1150	1120	0	0.17	4.60	4.28	75.03	0.32	5.00	0.00	0.00	0.00	0.00	0.34	0.03	0.00	83.77	
WDs		Aachen	No (seed-bearing)	G-13	Sample heart	Magnetite	-	-	1	1150	1120	0	0.20	4.73	4.47	75.01	0.38	4.92	0.00	0.00	0.00	0.00	0.39	0.06	0.00	90.80	
Average tot EDS											0.50	5.34	7.17	83.91	0.00	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
1 sigma tot EDS											0.20	1.04	1.47	10.06	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Average tot WDs											0.20	0.48	0.37	73.77	0.40	5.67	0.00	0.00	0.00	0.00	0.47	0.06	0.00				
1 sigma tot WDs											0.07	0.41	0.11	1.67	0.18	2.62	0.00	0.00	0.00	0.00	0.00	0.37	0.04	0.00			
Average edge WDs											0.36	4.30	4.37	74.40	0.39	5.39	0.00	0.00	0.00	0.00	0.24	0.08	0.00				
1 sigma edge WDs											0.09	0.16	0.12	0.43	0.07	0.30	0.00	0.00	0.00	0.00	0.00	0.23	0.07	0.00			
Average heart WDs											0.19	4.70	4.37	75.32	0.34	3.36	0.00	0.00	0.00	0.00	0.36	0.04	0.00				
1 sigma heart WDs											0.06	0.27	0.16	0.67	0.02	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Bilzon et al. 2025	EDS	Leuven	No (seed-bearing)	G-14	Magnetite	-	-	1	1150	1100	0	0.00	6.06	2.25	88.59	0.00	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00		
	WDs	Aachen	No (seed-bearing)	G-14	Sample heart	Magnetite	-	-	1	1150	1100	0	0.19	6.30	3.83	73.69	0.35	4.30	0.00	0.00	0.00	0.51	0.02	0.00	89.22		
	WDs	Aachen	No (seed-bearing)	G-14	Sample heart	Magnetite	-	-	1	1150	1100	0	0.21	6.25	3.88	73.96	0.38	4.43	0.00	0.00	0.00	0.52	0.04	0.00	89.20		
	WDs	Aachen	No (seed-bearing)	G-14	Sample edge	Magnetite	-	-	1	1150	1100	0	0.38	4.02	4.11	73.31	0.38	4.77	0.00	0.00	0.00	2.44	0.08	0.00	83.82		
	WDs	Aachen	No (seed-bearing)	G-14	Sample edge	Magnetite	-	-	1	1150	1100	0	0.14	7.02	4.08	71.74	0.37	4.85	0.00	0.00	0.00	1.80	0.01	0.00	90.02		
	WDs	Aachen	No (seed-bearing)	G-14	Sample edge	Magnetite	-	-	1	1150	1100	0	0.20	7.48	4.12	70.16	0.37	5.00	0.00	0.00	0.00	1.95	0.08	0.00	89.35		
	WDs	Aachen	No (seed-bearing)	G-14	Sample edge	Magnetite	-	-	1	1150	1100	0	0.16	7.09	4.16	70.00	0.36	4.76	0.00	0.00	0.00	2.00	0.07	0.00	89.77		
	Average tot WDs											0.18	6.85	3.39	71.98	0.37	4.70	0.00	0.00	0.00	0.00	1.55	0.05	0.00			
	1 sigma tot WDs											0.07	1.10	0.22	1.52	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Average edge WDs											0.10	7.17	4.18	70.00	0.37	4.85	0.00	0.00	0.00	0.00	2.06	0.08	0.00			
	1 sigma edge WDs											0.02	0.27	0.04	0.66	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Average heart WDs											0.20	6.27	3.84	73.82	0.36	4.42	0.00	0.00	0.00	0.00	0.57	0.04	0.00			
	1 sigma heart WDs											0.02	0.04	0.02	0.22	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Bilzon et al. 2025	EDS	Leuven	No (seed-bearing)	G-2-4	Magnetite	-	-	3	1150	1100	0	0.00	5.91	8.21	80.30	0.00	5.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	
		Leuven	No (seed-bearing)	G-2-4	Magnetite	-	-	-	3	1150	1100	0	0.00	5.78	8.07	80.83	0.00	5.32	0.00	0.00	0.00	0.00	0.00	0.00	100.00		
Aachen		No (seed-bearing)	G-2-4	Sample edge	Magnetite	-	-	3	1150	1100	0	0.00	5.08	9.19	75.07	0.38	3.90	0.00	0.00	0.00	0.04	0.00	0.00	100.00			
Aachen		No (seed-bearing)	G-2-4	Sample edge	Magnetite	-	-	3	1150	1100	0	0.17	4.98	4.20	74.77	0.41	4.90	0.00	0.00	0.00	0.18	0.07	0.00	89.71			
Aachen		No (seed-bearing)	G-2-4	Sample edge	Magnetite	-	-	3	1150	1100	0	0.22	4.88	4.01	75.30	0.41	4.94	0.00	0.00	0.00	0.14	0.04	0.00	93.90			
Aachen		No (seed-bearing)	G-2-4	Sample edge	Magnetite	-	-	3	1150	1100	0	0.36	4.90	4.04	75.20	0.42	5.12	0.00	0.00	0.00	0.34	0.08	0.00	89.75			
Aachen		No (seed-bearing)	G-2-4	Sample edge	Magnetite	-	-	3	1150	1100	0	0.18	4.80	4.33	75.51	0.34	4.61	0.00	0.00	0.00	0.26	0.05	0.00	89.75			
Aachen		No (seed-bearing)	G-2-4	Sample edge	Magnetite	-	-	3	1150	1100	0	0.17	4.93	3.98	75.83	0.35	4.67	0.00	0.00	0.00	0.08	0.08	0				

Place	EDSWDS	Observation	Initial Pre-heating	Sample	Phase	Position	CR (°C/h)	T ₁ (°C)	T ₂ (°C)	final step (h)	SiO ₂	TiO ₂	Al ₂ O ₃	FeO _x	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Cr ₂ O ₃	Total	Na ₂ O+K ₂ O
Leuven	WDS	No	G-0-a	Glass	Position 1	-		1590	1190	0	58.00	1.20	16.60	9.91	0.22	3.00	6.78	4.08	0.90	0.19	0.00	100.88	4.90
Leuven	WDS	No	G-0-a	Glass	Position 2	-		1190	1190	0	58.11	1.29	16.69	9.91	0.19	2.94	6.89	4.05	0.89	0.17	0.00	101.14	4.94
Leuven	WDS	No	G-0-a	Glass	Position 3	-		1190	1190	0	57.88	1.29	16.63	10.32	0.19	3.01	6.81	4.41	0.91	0.19	0.00	100.65	4.96
Leuven	WDS	No	G-0-a	Glass	Position 4	-		1190	1190	0	58.89	1.22	16.39	8.88	0.10	2.82	6.45	4.16	0.99	0.14	0.00	100.12	5.15
Leuven	WDS	No	G-0-a	Glass	Position 5	-		1190	1190	0	57.14	1.34	16.47	10.19	0.22	3.24	6.96	4.23	0.89	0.17	0.00	100.84	5.12
Leuven	WDS	No	G-0-a	Glass	Position 6	-		1190	1190	0	60.16	1.27	16.58	8.74	0.16	3.78	6.05	4.50	0.90	0.19	0.00	100.60	5.16
Leuven	WDS	No	G-0-a	Glass	Position 7	-		1190	1190	0	59.91	1.31	16.86	8.81	0.24	3.00	5.11	4.22	0.94	0.21	0.00	100.60	5.16
Leuven	WDS	No	G-0-a	Glass	Position 8	-		1190	1190	0	56.84	1.29	16.68	11.00	0.24	3.12	7.06	4.03	0.86	0.21	0.00	101.32	4.85
Average																							
1 sigma																							
Leuven	EDS	No	G-0-b-1	Glass	Position 1	-		1190	1190	0	58.13	1.21	17.58	8.04	0.17	3.29	6.20	4.21	0.83	0.23	0.00	99.88	5.04
Leuven	EDS	No	G-0-b-1	Glass	Position 2	-		1190	1190	0	57.66	1.24	17.46	8.52	0.17	3.29	6.38	4.21	0.83	0.24	0.00	99.90	4.95
Leuven	EDS	No	G-0-b-1	Glass	Position 3	-		1190	1190	0	58.02	1.18	17.64	8.01	0.18	3.36	6.15	4.44	0.80	0.23	0.00	99.90	5.14
Leuven	EDS	No	G-0-b-1	Glass	Position 4	-		1190	1190	0	60.29	1.26	17.69	8.53	0.21	3.25	6.44	4.44	0.51	0.44	0.00	99.88	5.14
Leuven	EDS	No	G-0-b-1	Glass	Position 5	-		1190	1190	0	59.91	1.07	17.66	6.66	0.15	3.28	5.48	4.66	0.82	0.24	0.00	99.92	4.58
Leuven	EDS	No	G-0-b-1	Glass	Position 6	-		1190	1190	0	59.91	1.05	17.67	6.54	0.14	3.28	5.45	4.79	0.82	0.24	0.00	99.88	5.01
Average																							
1 sigma																							
Leuven	EDS	No	G-0-b-2	Glass	Position 1	-		1190	1190	0	58.28	1.20	17.67	8.31	0.18	3.17	6.24	3.77	0.85	0.23	0.00	99.89	4.62</

Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	58.15	1.40	16.48	10.72	0.21	2.84	4.56	3.97	1.02	0.32	0.00	99.96	4.99
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	58.36	1.48	16.14	10.60	0.14	2.71	5.09	3.82	1.00	0.30	0.00	99.63	4.82
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	57.15	1.43	15.96	11.08	0.17	2.81	5.52	3.87	1.00	0.38	0.00	99.96	4.87
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	56.27	1.50	15.96	11.06	0.19	3.09	5.82	3.62	0.91	0.37	0.00	99.87	4.53
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	59.02	1.51	16.37	9.83	0.13	2.61	4.62	4.18	1.04	0.30	0.00	99.40	5.22
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	56.61	1.61	15.80	11.73	0.23	3.09	6.05	3.46	0.85	0.28	0.00	99.70	4.31
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	56.15	1.67	15.78	11.78	0.21	3.05	6.18	3.50	0.84	0.31	0.00	99.56	4.44
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	56.87	1.73	15.80	11.21	0.30	2.92	6.18	3.51	0.89	0.31	0.00	99.71	4.40
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	57.50	1.59	15.96	11.02	0.21	2.86	6.01	3.58	0.91	0.35	0.00	99.98	4.49
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	58.23	1.60	15.96	10.49	0.13	2.77	5.83	3.67	0.96	0.25	0.00	99.98	4.63
Leuven	EDS	No	G0-3	Glass	Glass	-	1175	1175	0	58.10	1.66	15.83	10.32	0.14	2.73	5.83	3.70	1.00	0.28	0.00	99.98	4.70
										Average	57.49	1.56	16.00	11.01	0.18	2.86	5.63	3.72	0.95	0.31	0.00	4.67
										1 sigma	0.95	0.11	0.23	0.74	0.05	0.16	0.60	0.22	0.07	0.04	0.00	0.29
Leuven	EDS	No	G0-2	Glass	Position 1	-	1180	1180	0	57.068	1.269	15.844	10.168	0.271	3.418	6.498	3.805	0.983	0.34	0	99.583	4.97
Leuven	EDS	No	G0-2	Glass	Position 2	-	1180	1180	0	57.15	1.373	15.80	10.052	0.197	3.371	6.685	3.999	0.945	0.361	0	100.107	4.94
Leuven	EDS	No	G0-2	Glass	Position 3	-	1180	1180	0	56.658	1.166	16.013	11.247	0.205	3.434	6.67	4.024	0.913	0.289	0	100.619	4.94
Leuven	EDS	No	G0-2	Glass	Position 4	-	1180	1180	0	57.076	1.286	16.319	10.19	0.195	3.323	6.403	3.617	0.946	0.24	0	99.845	4.70
Leuven	EDS	No	G0-2	Glass	Position 5	-	1180	1180	0	56.964	1.37	15.97	9.762	0.193	3.37	6.113	3.842	0.878	0.238	0	98.72	4.52
Leuven	EDS	No	G0-2	Glass	Position 6	-	1180	1180	0	56.611	1.437	16.147	9.993	0.183	3.396	6.594	4.002	0.9	0.262	0	99.525	4.90
Leuven	EDS	No	G0-2	Glass	Position 7	-	1180	1180	0	57.229	1.38	16.263	10.228	0.185	3.327	6.243	3.9	0.93	0.268	0	99.563	4.83
										Average	56.96	1.33	16.09	10.24	0.20	3.38	6.47	3.91	0.93	0.27	0.00	4.84
										1 sigma	0.20	0.09	0.17	0.47	0.03	0.04	0.22	0.09	0.03	0.03	0.00	0.12
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	56.35	1.46	15.47	11.72	0.25	3.13	6.84	3.84	0.93	0.18	0	99.96	4.77
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	56.76	1.51	15.40	12.24	0.21	3.28	6.69	3.69	0.95	0.26	0	99.98	4.64
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	56.34	1.42	15.54	11.82	0.26	3.13	6.60	3.74	0.93	0.17	0	99.96	4.67
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	56.57	1.52	15.52	11.40	0.23	3.32	6.51	3.75	0.94	0.21	0	99.96	4.69
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	56.33	1.53	15.31	11.61	0.23	3.29	6.59	3.84	0.94	0.32	0	99.98	4.78
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	56.05	1.40	15.59	11.72	0.24	3.33	6.68	3.79	0.94	0.22	0	99.96	4.73
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	59.86	1.37	15.74	8.63	0.22	2.78	5.61	4.34	1.23	0.19	0	99.96	5.57
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	60.67	1.42	15.89	7.98	-0.01	2.70	5.46	4.37	1.20	0.30	0	99.97	5.57
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	60.41	1.41	15.81	8.20	0.17	2.76	5.42	4.45	1.17	0.18	0	99.97	5.62
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	60.68	1.50	15.93	7.85	-0.01	2.70	5.35	4.48	1.18	0.23	0	99.98	5.66
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	59.57	1.34	15.55	9.00	0.25	2.83	5.72	4.28	1.11	0.23	0	99.97	5.39
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	59.88	1.37	15.66	8.85	0.14	2.81	5.66	4.30	1.13	0.18	0	99.97	5.43
Leuven	EDS	No	G0-4	Glass	Glass	-	1160	1160	0	59.05	1.38	15.74	9.41	0.17	2.80	5.72	4.19	0.17	0.24	0	99.96	5.49
										Average	58.27	1.43	15.62	10.84	0.18	3.01	6.05	4.08	1.07	0.22	0.00	5.14
										1 sigma	2.02	0.06	0.19	1.70	0.09	0.25	0.56	0.21	0.12	0.05	0.00	0.43
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.78	1.29	15.08	10.31	0.21	3.05	5.84	3.82	1.00	0.38	0	99.97	4.80
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.74	1.29	15.11	10.34	0.19	3.59	5.89	4.02	0.88	0.39	0	99.97	4.81
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.73	1.28	15.06	10.30	0.21	3.57	5.59	3.98	1.01	0.27	0	99.97	4.99
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.91	1.30	15.09	10.43	0.22	3.58	5.65	3.50	1.01	0.30	0	99.98	4.51
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.80	1.29	15.06	10.30	0.19	3.59	5.61	3.84	1.01	0.27	0	99.98	4.58
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.83	1.27	15.12	10.33	0.21	3.56	5.66	3.72	1.01	0.28	0	99.98	4.73
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.05	1.34	14.85	10.54	0.20	3.79	5.79	4.17	0.96	0.28	0	99.96	5.13
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.23	1.33	14.89	10.49	0.20	3.77	5.77	4.05	0.96	0.26	0	99.97	5.06
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.36	1.34	14.87	10.31	0.19	3.76	5.72	4.23	0.95	0.25	0	99.97	5.18
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.30	1.35	14.91	10.35	0.24	3.76	5.70	4.17	0.97	0.23	0	99.97	5.14
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.08	1.37	14.86	10.45	0.22	3.80	5.77	4.23	0.94	0.26	0	99.97	5.17
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.09	1.35	14.89	10.50	0.19	3.80	5.74	4.18	0.96	0.27	0	99.96	5.14
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.09	1.35	14.89	10.50	0.19	3.80	5.74	4.18	0.96	0.27	0	99.96	5.14
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.33	1.35	14.91	10.31	0.19	3.78	5.72	4.19	0.94	0.26	0	99.97	5.13
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	58.30	1.33	14.87	10.49	0.22	3.73	5.74	4.06	0.96	0.29	0	99.98	5.02
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	57.63	1.47	14.86	10.53	0.21	3.87	5.69	4.12	0.93	0.29	0	99.97	5.09
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	57.72	1.45	14.88	10.40	0.25	3.94	5.88	4.14	0.91	0.30	0	99.96	5.05
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	57.85	1.39	15.04	10.41	0.21	3.88	5.80	4.20	0.94	0.26	0	99.97	5.14
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	57.74	1.47	14.99	10.40	0.26	3.85	5.86	4.13	0.93	0.25	0	99.97	5.06
Leuven	EDS	No	G0-5	Glass	-	-	1150	1150	0	57.87	1.42	14.98	10.36	0.21	3.86	5.80	4.17	0.93	0.27	0	99.97	5.06
Leuven	EDS	No	G0-5	Glass	-	-	1150	1														

LMV Clement	WDS	No	G1-2	Glass	Position 1	1	1190	1137	0	60.3749	1.5153	15.3435	8.983	0.2462	2.7538	5.2903	4.4219	1.2223	0.168	0	100.32	5.64
LMV Clement	WDS	No	G1-2	Glass	Position 2	1	1190	1137	0	60.4545	1.4251	15.4345	8.9699	0.1605	2.8543	5.2733	4.295	1.1607	0.1383	0	99.75	5.57
LMV Clement	WDS	No	G1-2	Glass	Position 3	1	1190	1137	0	60.3343	1.3885	15.7805	8.8471	0.1029	2.9087	5.2513	4.4207	1.1504	0.1853	0	100.47	5.57
LMV Clement	WDS	No	G1-2	Glass	Position 4	1	1190	1137	0	59.5341	1.4038	15.2965	9.1403	0.2084	3.0585	5.2693	4.5055	1.2044	0	100.47	5.69	
LMV Clement	WDS	No	G1-2	Glass	Position 5	1	1190	1137	0	59.6314	1.5397	15.3763	9.2164	0.2666	3.081	5.3903	4.2733	1.1309	0.2404	0	100.15	5.40
LMV Clement	WDS	No	G1-2	Glass	Position 6	1	1190	1137	0	60.2319	1.4249	15.3005	8.1528	0.1623	2.9796	5.2589	4.3724	1.1818	0.2044	0	100.27	5.55
LMV Clement	WDS	No	G1-2	Glass	Position 7	1	1190	1137	0	60.0303	1.4257	15.301	8.8275	0.1893	2.8956	5.1534	4.3587	1.1391	0.1894	0	99.89	5.53
LMV Clement	WDS	No	G1-2	Glass	Position 8	1	1190	1137	0	59.9122	1.4314	15.4867	9.9054	0.2008	2.9195	5.2422	1.4458	1.1723	0.2497	0	100.13	5.63
LMV Clement	WDS	No	G1-2	Glass	Position 9	1	1190	1137	0	59.2419	1.4581	15.5081	8.7759	0.1199	3.0417	5.3408	4.4843	1.1459	0.1799	0	99.38	5.35
LMV Clement	WDS	No	G1-2	Glass	Position 10	1	1190	1137	0	60.1465	1.507	15.4038	8.9936	0.2084	2.8561	5.2538	4.4145	1.1531	0.2167	0	100.16	5.57
Aachen	WDS	No	G1-2	Glass	Position 11	1	1190	1137	0	59.497	1.418	14.943	8.352	0.15	2.988	4.7	4.325	1.112	0.212	0	97.69	5.47
Aachen	WDS	No	G1-2	Glass	Position 12	1	1190	1137	0	59.219	1.478	14.863	8.827	0.186	3.148	5.122	4.433	1.138	0.252	0.049	98.71	5.56
Aachen	WDS	No	G1-2	Glass	Position 13	1	1190	1137	0	59.033	1.347	14.93	8.973	0.128	3.12	5.037	4.366	1.091	0.171	0.063	98.26	5.46
Aachen	WDS	No	G1-2	Glass	Position 14	1	1190	1137	0	59.346	1.366	15.02	8.768	0.22	3.103	4.949	4.354	1.113	0.272	0.02	98.54	5.48
Aachen	WDS	No	G1-2	Glass	Position 15	1	1190	1137	0	59.252	1.305	15.133	8.84	0.174	2.999	5.04	4.566	1.108	0.111	0	98.53	5.67
Aachen	WDS	No	G1-2	Glass	Position 16	1	1190	1137	0	59.782	1.493	14.833	8.831	0.147	2.925	4.863	4.3	1.146	0.192	0	98.51	5.45
Aachen	WDS	No	G1-2	Glass	Position 17	1	1190	1137	0	59.573	1.426	14.876	8.867	0.183	3.119	4.997	4.383	1.12	0.272	0	98.62	5.50
Aachen	WDS	No	G1-2	Glass	Position 18	1	1190	1137	0	58.865	1.466	14.754	8.702	0.122	3.142	5.186	4.393	1.114	0.221	0.057	97.88	5.38
Aachen	WDS	No	G1-2	Glass	Position 19	1	1190	1137	0	58.906	1.426	14.848	8.988	0.186	3.165	5.22	4.371	1.108	0.151	0	98.37	5.40
Aachen	WDS	No	G1-2	Glass	Position 20	1	1190	1137	0	59.307	1.382	14.781	8.861	0.128	3.146	5.263	4.1	1.122	0.171	0.03	98.29	5.22
Aachen	WDS	Next to Pt wire	G1-2	Glass	Position 21	1	1190	1137	0	59.093	1.516	14.994	8.684	0.205	3.165	5.263	4.279	0.172	0.242	0	98.29	5.48
Average										59.61	1.44	15.13	8.87	0.18	3.02	5.17	4.38	1.14	0.21	0.01	5.51	
1 sigma										0.59	0.06	0.31	0.20	0.04	0.12	0.18	0.10	0.03	0.05	0.02	0.01	
Aachen	WDS	No	G1-3	Glass	Position 1	1	1190	1120	0	58.718	1.392	13.786	9.551	0.152	3.022	5.592	3.884	1.096	0.151	0.022	98.06	5.40
Aachen	WDS	No	G1-3	Glass	Position 2	1	1190	1120	0	57.92	1.633	13.718	9.929	0.238	3.028	5.699	4.26	1.026	0.221	0.022	98.58	5.29
Aachen	WDS	No	G1-3	Glass	Position 3	1	1190	1120	0	57.935	1.383	13.718	9.826	0.232	3.062	5.515	3.871	1.057	0.211	0.047	97.81	5.47
Aachen	WDS	No	G1-3	Glass	Position 4	1	1190	1120	0	58.083	1.57	13.701	10.021	0.213	3.024	5.546	4.417	0.991	0.171	0	98.54	5.41
Aachen	WDS	No	G1-3	Glass	Position 5	1	1190	1120	0	57.964	1.474	13.781	9.971	0.181	3.181	5.683	4.138	1.037	0.211	0	98.53	5.42
Aachen	WDS	No	G1-3	Glass	Position 6	1	1190	1120	0	57.987	1.473	13.764	9.709	0.195	3.766	5.396	4.218	1.065	0.271	0	97.84	5.28
Aachen	WDS	No	G1-3	Glass	Position 7	1	1190	1120	0	58.226	1.57	13.933	9.629	0.241	3.816	5.449	4.109	1	0.251	0	98.09	5.11
Aachen	WDS	No	G1-3	Glass	Position 8	1	1190	1120	0	58.383	1.407	13.774	9.085	0.278	3.566	5.48	4.13	0.171	0.005	98.54	5.48	
Aachen	WDS	No	G1-3	Glass	Position 9	1	1190	1120	0	59.502	1.465	14.211	8.607	0.208	3.48	5.08	4.398	1.122	0.252	0	98.52	5.20
Average										58.36	1.52	13.81	9.59	0.23	3.77	5.47	4.16	1.05	0.21	0.01	5.25	
1 sigma										0.58	0.08	0.16	0.47	0.04	0.15	0.17	0.20	0.05	0.04	0.02	0.01	
LMV Clement	WDS	No	G1-4	Glass	Position 1	1	1190	1100	0	60.0565	1.6545	15.4294	9.2794	0.234	3.154	5.294	4.304	1.2562	0.2113	0	99.59	5.19
LMV Clement	WDS	No	G1-4	Glass	Position 2	1	1190	1100	0	59.3691	1.6727	13.9159	10.1515	0.2282	3.1548	4.9184	4.0801	1.1945	0.2737	0	99.28	5.27
LMV Clement	WDS	No	G1-4	Glass	Position 3	1	1190	1100	0	60.1023	1.7396	13.8623	10.4314	0.2522	3.4937	5.1883	4.1562	1.2141	0.2668	0	100.65	5.37
LMV Clement	WDS	No	G1-4	Glass	Position 4	1	1190	1100	0	59.526	1.628	13.819	9.787	0.234	3.294	4.2056	1.2115	0.217	0	99.54	5.19	
LMV Clement	WDS	No	G1-4	Glass	Position 5	1	1190	1100	0	59.6564	1.5925	13.9248	10.1846	0.2155	3.3803	5.0923	4.2826	1.1629	0.2803	0	99.77	5.45
LMV Clement	WDS	No	G1-4	Glass	Position 6	1	1190	1100	0	59.5327	1.6654	13.8883	10.0549	0.2195	3.4934	4.9485	4.0955	1.1353	0.2237	0	99.31	5.29
LMV Clement	WDS	No	G1-4	Glass	Position 7	1	1190	1100	0	59.8052	1.6925	13.7651	10.1962	0.1899	3.4914	5.0279	4.1702	1.2039	0.2601	0	99.75	5.38
LMV Clement	WDS	No	G1-4	Glass	Position 8	1	1190	1100	0	58.577	1.7153	13.7897	10.6202	0.2793	3.156	5.185	4.0909	1.1495	0.281	0.007	97.81	5.18
LMV Clement	WDS	No	G1-4	Glass	Position 9	1	1190	1100	0	58.3749	1.8575	13.8226	10.7132	0.2568	3.5534	5.3655	4.0612	1.1139	0.3112	0	99.25	5.18
LMV Clement	WDS	No	G1-4	Glass	Position 10	1	1190	1100	0	58.538	1.7851	13.6143	10.7118	0.2244	3.6126	5.3487	4.1089	1.1473	0.3109	0	99.59	5.26
LMV Clement	WDS	No	G1-4	Glass	Position 11	1	1190	1100	0	58.753	1.7532	13.7884	10.5114	0.2362	3.6245	5.4402	4.0497	1.2054	0.257	0	99.59	5.26
Aachen	WDS	No	G1-4	Glass	Position 14	1	1190	1100	0	58.696	1.643	13.518	9.929	0.201	3.427	4.442	4.31	1.239	0.202	0.015	97.72	5.55
Aachen	WDS	No	G1-4	Glass	Position 15	1	1190	1100	0	58.665	1.658	13.464	9.737	0.262	3.569	4.705	4.935	1.172	0.272	0.035	97.58	5.21
Aachen	WDS	No	G1-4	Glass	Position 16	1	1190	1100	0	58.763	1.513	13.384	9.864	0.153	3.596	4.883	4.916	1.159	0.211	0.001	97.55	5.18
Aachen	WDS	No	G1-4	Glass	Position 17	1	1190	1100	0	58.825	1.593	13.344	9.974	0.195	3.635	4.799	4.186	1.185	0.262	0	98.00	5.37
Aachen	WDS	No	G1-4	Glass	Position 18	1	1190	1100	0	58.331	1.612	13.332	10.055	0.293	3.585	4.854	4.085	1.181	0.282	0	98.01	5.02
Aachen	WDS	No	G1-4	Glass	Position 19	1	1190	1100	0	58.156	1.672	13.229	10.345	0.171	3.772	5.011	4.042	1.112	0.291	0.002	97.80	5.15
LMV Clement	WDS	No	G1-4	Glass	Position 20	1	1190	1100	0	57.547	1.689	13.108	10.699	0.216	4.002	5.237	4.04	1.117	0.361	0.006	97.93	5.16
Aachen	WDS	No	G1-4	Glass	Position 21	1	1190	1100	0	57.38	1.728	13.04	10.951	0.292	4.076	5.224	4.088	1.091	0.311	0.008	98.19	5.18
Aachen	WDS	Next to Pt wire	G1-4	Glass	Position 22	1	1190	1100	0	58.885	1.654	13.244	9.977	0.179	3.771	5.101	4.602	1.098	0.286	0	98.94	5.22
Average										58.08	1.68	13.57	10.19	0.22	3.69	5.02.						

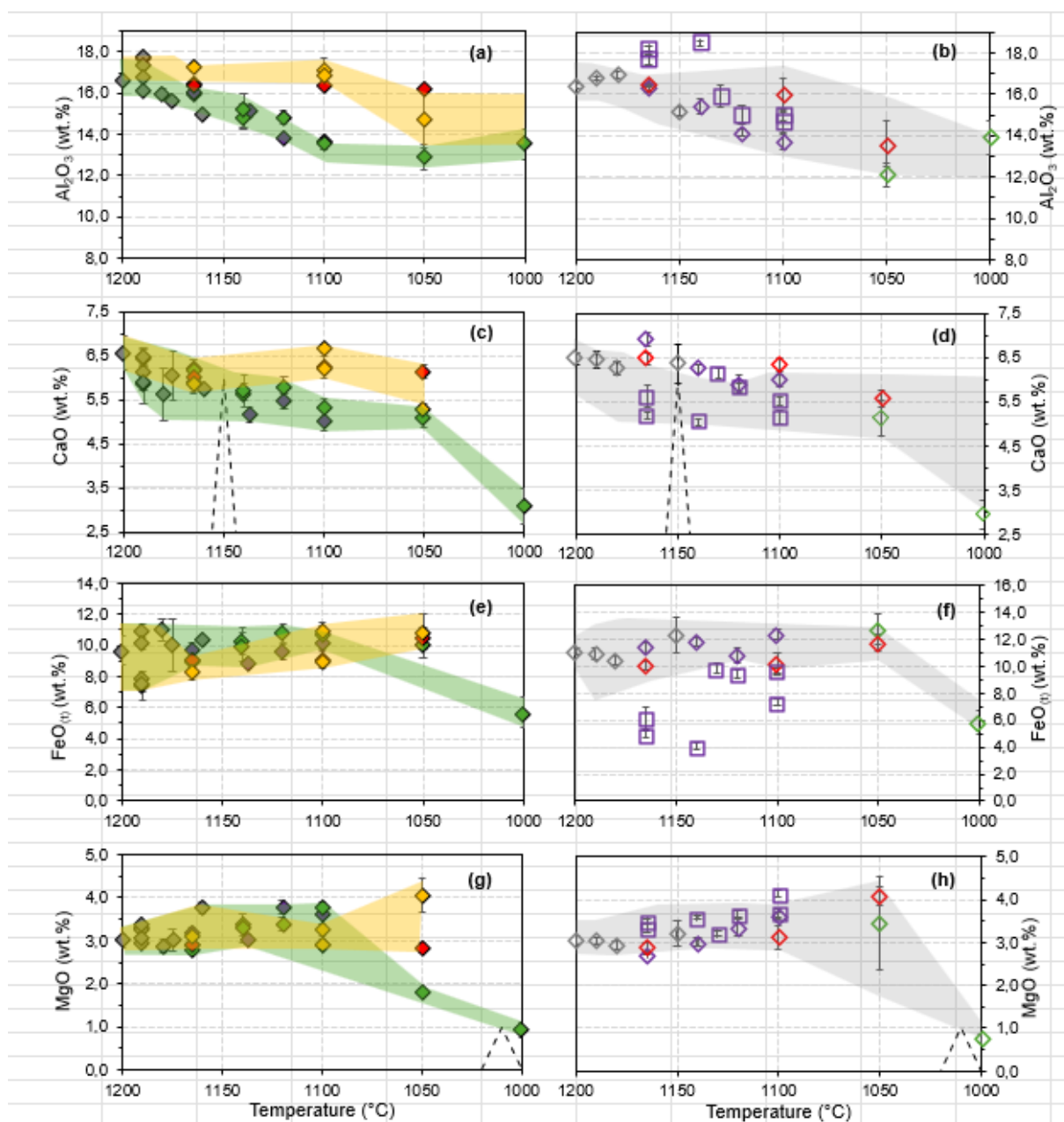


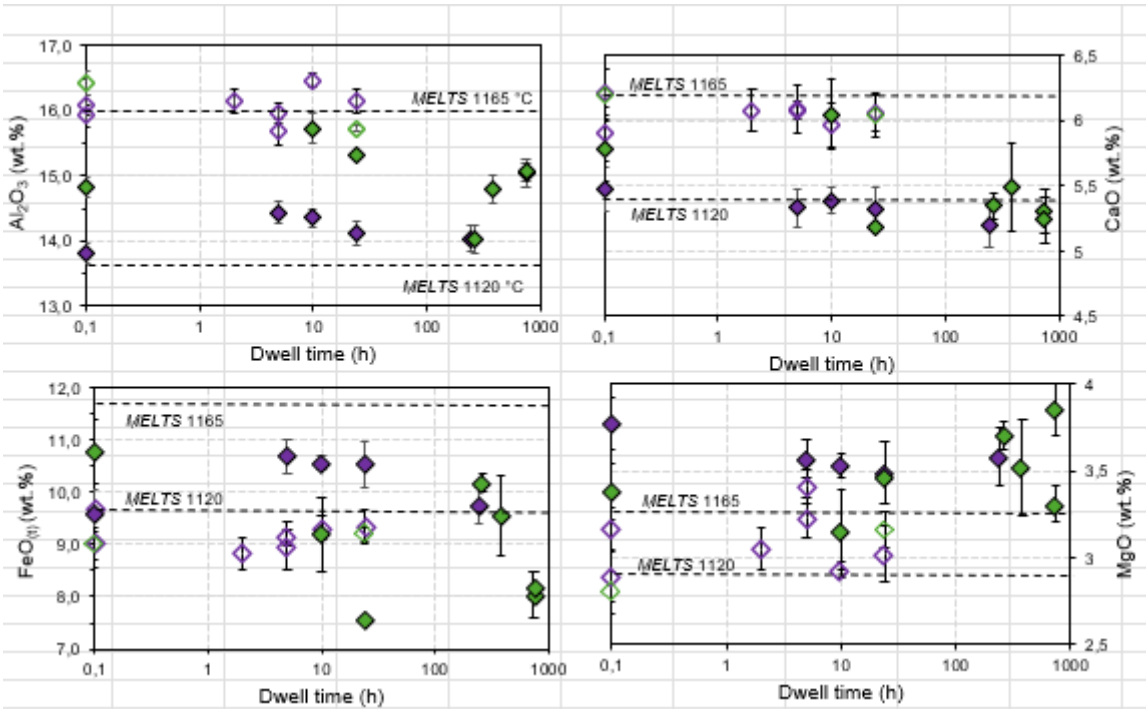
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 2	9	1190	1140	0	59.0399	1.5061	14.6986	10.4029	0.213	3.2786	5.5588	4.0976	1.0937	0.1977	0	100.0853	5.19
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 4	9	1190	1140	0	59.1468	1.5199	14.6205	10.8322	0.2245	3.2869	5.7876	4.0256	1.0752	0.2444	0	100.8146	5.10
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 5	9	1190	1140	0	58.6731	1.5868	14.4936	10.8525	0.2486	3.4629	5.7699	3.9522	1.0327	0.2806	0	100.3429	4.98
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 6	9	1190	1140	0	58.1684	1.509	14.4628	11.0471	0.2632	3.5887	5.8763	3.8865	1.0445	0.2702	0	100.2887	5.03
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 7	9	1190	1140	0	58.4583	1.5665	14.2877	10.9808	0.2107	3.5455	5.7878	3.9519	1.0228	0.2659	0	100.0779	4.97
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 8	9	1190	1140	0	57.881	1.5959	14.4074	11.3423	0.1763	3.5985	5.8601	3.6568	1.0939	0.2765	0	100.0347	4.90
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 9	9	1190	1140	0	58.0142	1.5989	14.4397	11.0153	0.2571	3.6005	5.8653	4.0265	0.9894	0.3094	0	100.1409	5.02
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 9	9	1190	1140	0	58.5386	1.6581	14.1517	10.829	0.2068	3.6051	5.7377	3.9177	1.0514	0.2747	0	99.9721	4.98
LMV	Clement	WDS	No	G-3-2a1	Glass	Position 10	9	1190	1140	0	58.729	1.5794	14.0718	10.9554	0.2623	3.613	5.7797	3.8655	1.0774	0.2514	0	99.8159	4.94
Aachen	WDS	No	G-3-2a1	Glass	Position 11	9	1190	1140	0	57.616	1.502	14.97	10.146	0.168	3.553	5.517	4.118	0.085	0.381	0	99.156	5.10	
Aachen	WDS	No	G-3-2a1	Glass	Position 12	9	1190	1140	0	59.361	1.24	15.912	8.891	0.089	2.975	5.324	4.276	1.088	0.282	0	99.396	5.26	
Aachen	WDS	No	G-3-2a1	Glass	Position 13	9	1190	1140	0	59.137	1.493	15.547	6.988	0.186	3.1	5.513	4.157	1.021	0.201	0.013	99.373	5.18	
Aachen	WDS	No	G-3-2a1	Glass	Position 14	9	1190	1140	0	59.505	1.293	16.02	8.814	0.247	2.909	5.408	4.376	1.065	0.151	0	99.768	5.44	
Aachen	WDS	No	G-3-2a1	Glass	Position 15	9	1190	1140	0	59.011	1.433	15.501	9.247	0.199	3.247	5.514	4.241	1.015	0.171	0.01	99.658	5.12	
Average											58.67	1.586	14.36	10.26	0.21	3.37	5.66	4.07	1.05	0.25	0.00	5.12	
1 sigma											0.58	0.11	0.64	0.87	0.05	0.25	0.19	0.16	0.04	0.06	0.00	0.19	
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 1	9	1190	1140	0	58.0916	1.5455	15.8596	9.9138	0.2036	3.2113	5.9097	4.27	1.0385	0.2631	0	100.30	5.31
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 2	9	1190	1140	0	58.9807	1.4826	15.7915	9.1336	0.2013	2.9658	5.6129	4.3339	1.0967	0.2977	0	99.88	5.43
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 3	9	1190	1140	0	59.5556	1.3576	16.1972	8.8506	0.1538	2.9101	5.574	4.4848	1.0863	0.1848	0	100.35	5.27
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 4	9	1190	1140	0	57.4522	1.5406	15.223	9.8909	0.254	3.1591	5.9791	4.2776	0.9727	0.3023	0	99.905	5.25
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 5	9	1190	1140	0	57.9568	1.6198	15.5093	10.4559	0.2016	3.4902	6.0593	4.2799	0.976	0.3833	0	99.88	5.21
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 6	9	1190	1140	0	57.3291	1.5996	15.5327	10.4173	0.2796	3.4127	6.2165	4.2623	0.9577	0.306	0	100.31	5.22
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 7	9	1190	1140	0	56.4195	1.5146	15.6703	10.6701	0.2443	3.3953	6.311	4.155	0.9844	0.3148	0	99.64	5.10
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 8	9	1190	1140	0	58.0223	1.5333	15.2721	10.4047	0.1947	3.4234	6.181	4.0944	0.9821	0.2912	0	99.30	4.99
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 9	9	1190	1140	0	58.0827	1.562	15.2677	9.7531	0.2044	3.179	5.78	4.3695	1.0336	0.2724	0	99.54	5.40
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 10	9	1190	1140	0	59.8323	1.4622	15.9922	8.1872	0.1976	2.8139	5.3425	4.7409	1.169	0.3114	0	100.05	5.91
LMV	Clement	WDS	No	G-3-2a2	Glass	Position 11	9	1190	1140	0	59.4916	1.5846	16.0187	7.7515	0.2404	2.7153	5.1746	4.5594	1.2249	0.2409	0	98.58	5.76
Aachen	WDS	No	G-3-2a2	Glass	Position 12	9	1190	1140	0	58.62	1.582	16.086	8.123	0.222	4.099	1.022	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Aachen	WDS	No	G-3-2a2	Glass	Position 13	9	1190	1140	0	57.354	1.512	13.995	10.456	0.235	3.521	5.492	4.101	1.046	0.301	0	99.167	5.21	
Aachen	WDS	No	G-3-2a2	Glass	Position 14	9	1190	1140	0	58.907	1.621	14.837	10.486	0.207	3.674	5.475	4.191	0.976	0.281	0	97.86	5.17	
Aachen	WDS	No	G-3-2a2	Glass	Position 15	9	1190	1140	0	58.831	1.604	13.807	10.673	0.225	3.754	5.456	4.077	1.102	0.361	0	97.81	5.19	
Aachen	WDS	No	G-3-2a2	Glass	Position 16	9	1190	1140	0	58.013	1.42	14.392	10.07	0.143	3.368	5.379	4.086	1.102	0.381	0	97.95	5.19	
Average											57.82	1.53	15.17	9.89	0.22	3.29	5.71	4.27	1.04	0.28	0.00	5.21	
1 sigma											0.70	0.07	0.82	0.94	0.04	0.32	0.36	0.19	0.08	0.05	0.00	0.27	
LMV	Clement	WDS	No	G-3-3	Glass	Position 1	9	1190	1120	0	58.4245	1.6285	14.787	10.4893	0.1795	3.4895	6.1625	4.0853	1.0557	0.2965	0	100.44	5.22
LMV	Clement	WDS	No	G-3-3	Glass	Position 2	9	1190	1120	0	58.2611	1.4808	15.0913	9.8866	0.1633	3.1787	5.7054	4.1552	1.0845	0.2374	0	99.71	5.24
LMV	Clement	WDS	No	G-3-3	Glass	Position 3	9	1190	1120	0	57.2647	1.5544	14.601	11.4417	0.2036	3.4696	5.9253	3.9542	0.9757	0.3473	0	99.71	4.91
LMV	Clement	WDS	No	G-3-3	Glass	Position 4	9	1190	1120	0	58.7467	1.5671	14.921	10.8127	0.2051	3.7976	6.045	4.0945	1.0264	0.314	0	100.38	5.49
LMV	Clement	WDS	No	G-3-3	Glass	Position 5	9	1190	1120	0	56.4737	1.483	15.6126	11.0821	0.199	3.3124	6.1613	4.1594	0.9866	0.298	0	99.76	5.15
LMV	Clement	WDS	No	G-3-3	Glass	Position 6	9	1190	1120	0	56.5184	1.4833	15.2668	11.1853	0.2221	3.5632	6.1462	4.0145	0.9862	0.2489	0	99.61	5.00
LMV	Clement	WDS	No	G-3-3	Glass	Position 7	9	1190	1120	0	58.1163	1.5234	14.8638	10.5159	0.2477	3.2233	5.7218	4.1246	1.1268	0.2758	0	99.74	5.25
LMV	Clement	WDS	No	G-3-3	Glass	Position 8	9	1190	1120	0	57.8353	1.5349	15.466	10.546	0.2039	3.4665	6.0037	4.0971	1.0239	0.3291	0	99.78	5.25
LMV	Clement	WDS	No	G-3-3	Glass	Position 9	9	1190	1120	0	57.8978	1.5249	14.7431	10.818	0.2104	3.4355	5.9181	4.2468	1.0683	0.2883	0	99.35	5.31
LMV	Clement	WDS	No	G-3-3	Glass	Position 10	9	1190	1120	0	58.642	1.5915	14.5027	11.1324	0.2499	3.3384	6.0398	4.0141	1.0033	0.334	0	99.04	5.02
LMV	Clement	WDS	No	G-3-3	Glass	Position 11	9	1190	1120	0	57.0704	1.4123	15.0693	11.2402	0.1993	3.2103	5.7127	4.1317	1.089	0.2719	0	99.13	5.22
Aachen	WDS	No	G-3-3	Glass	Position 12	9	1190	1120	0	57.177	1.593	14.661	11.433	0.24	3.549	6.088	3.88	0.958	0.327	0.027	99.48	4.84	
Aachen	WDS	No	G-3-3	Glass	Position 13	9	1190	1120	0	57.279	1.604	14.414	11.004	0.286	3.491	5.504	3.862	1.017	0.341	0.006	98.81	4.88	
Aachen	WDS	No	G-3-3	Glass	Position 14	9	1190	1120	0	58.945	1.531	14.884	11.309	0.234	3.5	5.619	3.893	0.909	0.18	0	99.00	4.80	
Aachen	WDS	No	G-3-3	Glass	Position 15	9	1190	1120	0	58.445	1.536	15.11	9.609	0.265	3.223	5.348	3.853	1.017	0.191	0.012	98.76	4.65	
Aachen	WDS	No	G-3-3	Glass	Position 16	9	1190	1120	0	59.114	1.491	14.965	9.549	0.182	3.113	5.414	3.903	1.032	0.312	0	99.01	4.81	
Average											57.47	1.53	14.92	10.78	0.23	3.37	5.48	4.03	1.02	0.28	0.00	5.05	
1 sigma											0.79	0.07	0.85	0.63	0.03	0.16	0.24	0.14	0.05	0.05	0.01	0.20	
LMV	Clement	WDS	No	G-3-4	Glass	Position 1	9	1190	1100	0	59.8454	1.6734	14.678	10.8732	0.1758	3.4893	6.1625	4.0853	1.0557	0.2965	0	99.71	5.26
LMV	Clement	WDS	No	G-3-4	Glass	Position 2	9	1190	1100														

Aachen	WDS	No	G-4.2	Glass	Position 11	25	1190	1100	0	56,806	1,276	15,441	9,389	0,141	3,009	6,411	4,098	0,837	0,292	0	98,67	4,91
Aachen	WDS	No	G-4.2	Glass	Position 12	25	1190	1100	0	56,701	1,207	16,411	9,333	0,174	2,917	6,46	4,075	0,888	0,241	0	98,387	4,94
Aachen	WDS	No	G-4.2	Glass	Position 13	25	1190	1100	0	57,386	1,324	16,34	8,954	0,165	2,82	6,11	4,127	0,888	0,141	0,038	98,293	5,02
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	56,853	1,276	15,503	9,159	0,177	3,70	6,14	3,53	1,08	0,25	0,00	99,99	4,65
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	56,15	1,65	15,53	11,55	0,26	3,65	6,20	3,61	1,06	0,22	0,00	99,87	4,67
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	56,24	1,64	15,65	11,37	0,25	3,64	6,15	3,66	1,08	0,23	0,00	99,90	4,74
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	56,52	1,64	15,56	11,30	0,27	3,64	6,13	3,58	1,09	0,25	0,00	99,97	4,76
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	57,87	1,82	14,09	11,42	0,26	3,76	6,05	3,31	1,07	0,33	0,00	99,87	4,58
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	57,25	1,63	15,37	10,94	0,21	3,71	6,03	3,52	1,07	0,24	0,00	99,96	4,59
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	57,17	1,66	15,22	10,98	0,24	3,67	5,97	3,59	1,09	0,27	0,03	99,98	4,68
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	57,30	1,66	15,26	10,89	0,26	3,69	5,96	3,59	1,08	0,29	0,00	99,96	4,67
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	57,47	1,80	14,29	11,46	0,27	3,82	5,86	3,56	1,06	0,30	0,00	99,88	4,62
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	56,88	1,87	13,87	12,19	0,27	4,07	6,03	3,39	1,03	0,28	0,00	99,87	4,42
Leuven	EDS	Near Pig	G-4.2	Glass		25	1190	1100	0	56,83	1,59	15,36	10,33	0,24	4,71	4,94	3,80	1,15	0,33	0,00	99,89	4,56
Leuven	EDS	Near Pig	G-4.2	Glass		25	1190	1100	0	59,64	1,76	13,06	10,61	0,25	4,91	4,83	3,39	1,13	0,32	0,00	99,89	4,52
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	60,03	1,80	12,49	10,85	0,25	4,97	4,85	3,25	1,11	0,38	0,00	99,97	4,36
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	58,76	1,85	14,68	10,53	0,21	3,50	5,94	3,62	1,14	0,28	0,00	99,98	4,76
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	59,17	1,26	16,05	10,83	0,17	3,05	6,18	3,85	1,18	0,27	0,00	99,99	4,52
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	59,17	1,46	15,48	9,70	0,21	3,30	5,51	3,72	1,18	0,24	0,00	99,96	4,90
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	59,05	1,46	15,58	9,72	0,19	3,35	5,53	3,68	1,17	0,25	0,00	99,97	4,85
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	59,22	1,53	15,27	9,78	0,23	3,41	5,51	3,61	1,15	0,24	0,00	99,94	4,78
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	58,95	1,57	15,01	10,16	0,22	3,45	5,60	3,62	1,13	0,26	0,00	99,96	4,75
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	58,75	1,57	15,08	9,70	0,24	3,39	5,39	3,43	1,17	0,25	0,00	99,96	4,60
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	61,03	1,68	13,74	9,25	0,22	4,37	4,63	3,54	1,20	0,25	0,00	99,90	4,74
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	61,91	1,67	12,88	9,45	0,24	4,55	4,52	3,13	1,23	0,29	0,00	99,87	4,56
Leuven	EDS	No	G-4.2	Glass		25	1190	1100	0	61,20	1,70	13,36	9,39	0,22	4,60	4,50	3,41	1,22	0,29	0,00	99,88	4,63
Leuven	EDS	Average	EDS							56,54	1,66	14,56	10,59	0,24	3,89	5,55	3,50	1,13	0,27	0,00	99,90	4,63
Leuven	EDS	1 sigma	EDS							1,66	0,16	0,96	0,83	0,02	0,17	0,06	0,04	0,01	0,01	0,00	99,91	0,11
Leuven	EDS	Average	WDS							57,10	1,30	16,36	9,07	0,17	2,91	6,24	4,19	0,91	0,22	0,01	99,90	5,10
Aachen	WDS	No	G-4.3	Glass	Position 1	25	1190	1050	0	5,57	0,68	0,11	0,52	0,04	0,11	0,25	0,19	0,08	0,06	0,62	98,044	5,19
Aachen	WDS	No	G-4.3	Glass	Position 2	25	1190	1050	0	57,283	1,239	16,227	9,31	0,138	2,82	6,11	4,075	0,888	0,241	0	98,387	4,94
Aachen	WDS	No	G-4.3	Glass	Position 3	25	1190	1050	0	55,852	1,28	16,217	10,601	0,134	2,852	6,173	3,944	0,824	0,191	0	98,088	4,77
Aachen	WDS	No	G-4.3	Glass	Position 4	25	1190	1050	0	55,614	1,372	16,089	10,671	0,171	2,847	6,35	3,835	0,817	0,211	0,068	98,045	4,65
Aachen	WDS	No	G-4.3	Glass	Position 5	25	1190	1050	0	55,989	1,373	16,278	10,636	0,223	2,921	6,191	3,839	0,861	0,191	0	98,502	4,70
Aachen	WDS	No	G-4.3	Glass	Position 6	25	1190	1050	0	56,177	1,25	16,085	10,851	0,217	2,86	6,18	3,82	0,845	0,181	0,023	98,467	4,63
Aachen	WDS	No	G-4.3	Glass	Position 7	25	1190	1050	0	56,266	1,271	16,141	10,652	0,217	2,829	6,143	3,765	0,865	0,181	0	98,31	4,63
Aachen	WDS	No	G-4.3	Glass	Position 8	25	1190	1050	0	56,117	1,271	16,365	10,439	0,085	2,792	5,964	3,903	0,839	0,131	0	97,906	4,74
Aachen	WDS	No	G-4.3	Glass	Position 9	25	1190	1050	0	56,281	1,236	16,453	10,458	0,165	2,871	6,029	3,816	0,875	0,141	0,008	98,454	4,74
Aachen	WDS	No	G-4.3	Glass	Position 8	25	1190	1050	0	55,327	1,278	16,185	10,947	0,116	3,005	6,145	3,9	0,835	0,181	0	97,919	4,74
Leuven	EDS	Average	WDS							56,12	1,30	16,20	10,51	0,16	2,84	6,14	3,90	0,86	0,19	0,01	99,90	4,76
Leuven	EDS	1 sigma	WDS							0,57	0,05	0,09	0,49	0,05	0,11	0,17	0,13	0,05	0,03	0,02	99,88	0,18
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	57,85	1,16	17,14	11,69	0,16	1,17	0,02	4,54	0,85	0,21	0,05	99,96	5,16
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	58,93	1,13	17,23	0,83	0,15	2,96	5,69	4,69	0,92	0,25	0,00	99,96	5,81
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	58,94	1,07	17,53	7,58	0,18	3,09	5,59	4,86	0,85	0,25	0,00	99,90	5,71
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	59,29	1,08	16,58	7,59	0,17	3,13	5,45	4,95	0,87	0,24	0,00	99,92	5,74
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	57,76	1,18	17,19	6,82	0,18	3,21	5,10	4,49	0,82	0,24	0,00	99,98	5,31
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	57,83	1,17	17,23	6,74	0,18	3,12	6,07	4,51	0,84	0,23	0,00	99,91	5,35
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	57,83	1,22	17,12	6,78	0,14	3,15	6,07	4,55	0,84	0,22	0,00	99,91	5,39
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	58,18	1,14	17,10	6,67	0,16	3,13	5,98	4,54	0,86	0,22	0,00	99,97	5,40
Leuven	EDS	No	G-5.1	Glass		125	1190	1165	0	58,15	1,15	17,13	6,59	0,16	3,04	4,61	0,55	0,24	0,00	99,94	5,49	
Leuven	EDS	Average	EDS							58,32	1,14	17,25	6,33	0,15	3,12	5,88	4,63	0,86	0,23	0,00	99,90	5,49
Leuven	EDS	1 sigma	EDS							0,58	0,05	0,18	0,60	0,02	0,07	0,24	0,16	0,03	0,01	0,00	99,91	0,19
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,21	1,24	17,59	8,88	0,20	3,18	6,42	4,20	0,81	0,23	0,00	99,95	5,01
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,47	1,26	17,67	8,78	0,17	3,15	6,27	4,15	0,87	0,22	0,00	99,96	5,08
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,32	1,23	17,66	8,79	0,18	3,19	6,32	4,20	0,83	0,25	0,00	99,96	5,03
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,45	1,24	17,58	8,81	0,17	3,18	6,19	4,18	0,89	0,23	0,00	99,91	5,07
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,78	1,22	17,72	8,67	0,19	3,18	6,28	4,08	0,88	0,27	0,00	99,98	5,04
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,95	1,21	17,66	8,81	0,16	3,08	6,12	4,25	0,90	0,23	0,00	99,96	5,15
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,92	1,23	17,66	8,96	0,17	3,30	6,14	4,08	0,87	0,25	0,00	99,88	4,95
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,38	1,21	17,64	8,97	0,19	3,18	6,15	4,26	0,89	0,26	0,00	99,91	4,99
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,49	1,23	17,39	9,01	0,17	3,29	6,17	4,15	0,86	0,22	0,00	99,97	5,01
Leuven	EDS	No	G-5.2a1	Glass		125	1190	1100	0	57,56	1,24	17,20	8,99	0,17	3,18	6,32	4,21	0,88	0,24	0,00	99,	

Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.79	1.39	16.25	9.63	0.19	3.15	6.23	4.13	1.00	0.17	0.00	99.92	5.13
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.39	1.37	16.69	9.51	0.22	3.07	6.30	4.13	1.00	0.21	0.00	99.88	5.13
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.13	1.56	15.37	10.08	0.21	3.14	6.19	4.02	1.03	0.17	0.00	99.89	5.05
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.85	1.40	16.43	9.80	0.21	3.09	6.32	4.06	1.02	0.17	0.00	99.85	5.19
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.07	1.46	16.10	10.28	0.23	3.18	6.36	3.99	1.03	0.20	0.00	99.89	5.02
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.15	1.59	15.08	10.34	0.22	3.26	6.10	3.97	1.01	0.15	0.00	99.86	4.98
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.06	1.60	15.11	10.40	0.24	3.24	6.11	3.98	1.02	0.16	0.00	99.89	4.90
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.65	1.35	16.41	9.61	0.23	3.15	6.29	4.13	1.00	0.18	0.00	99.89	5.13
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.39	1.43	15.57	9.57	0.21	3.31	6.00	4.26	0.96	0.19	0.00	99.88	5.22
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.58	1.39	16.11	9.72	0.23	3.28	6.21	4.20	1.01	0.18	0.00	99.90	5.21
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.71	1.54	15.07	10.74	0.24	3.26	6.32	3.94	1.04	0.22	0.00	99.86	4.88
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.49	1.40	15.81	9.50	0.17	3.27	5.90	4.28	0.99	0.17	0.00	99.87	5.27
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.67	1.31	16.58	9.47	0.22	3.17	6.13	4.22	0.99	0.21	0.00	99.96	5.21
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.71	1.37	16.29	9.58	0.19	3.20	6.15	4.17	0.98	0.23	0.00	99.97	5.15
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.65	1.37	16.20	9.60	0.19	3.20	6.04	4.25	0.98	0.20	0.00	99.97	5.23
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.73	1.36	16.51	9.50	0.21	3.16	6.18	4.18	0.99	0.16	0.00	99.97	5.17
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.26	1.43	15.76	9.79	0.17	3.14	6.05	4.16	1.00	0.19	0.00	99.96	5.18
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.51	1.36	16.17	9.66	0.21	3.35	6.11	4.23	0.96	0.22	0.00	99.87	5.19
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.84	1.41	16.22	9.66	0.21	3.13	6.18	4.09	0.20	0.00	99.99	5.17	
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.47	1.58	14.99	10.23	0.26	3.29	5.95	3.96	1.04	0.21	0.00	99.87	5.00
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	57.62	1.43	16.13	9.97	0.22	3.21	6.19	4.07	0.98	0.17	0.00	99.98	5.06
Leuven	EDS		1210°C, 24h	G11-3	Glass		1	1210	1130	0	58.34	1.56	15.19	10.21	0.20	3.28	5.94	4.08	0.97	0.20	0.00	99.96	5.05
				Average	EDS			57.67	1.44	15.91	9.85	0.21	3.21	6.14	4.11	1.00	0.19	0.00				5.11	
				1 sigma	EDS			0.39	0.69	0.54	0.37	0.62	0.67	0.12	0.12	0.62	0.62	0.62				0.41	
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	59.82	1.61	14.34	9.27	0.20	3.66	5.98	4.20	1.08	0.23	0.00	99.89	5.28
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.96	1.64	14.50	9.61	0.23	3.70	5.75	4.13	1.08	0.25	0.00	99.84	5.21
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.99	1.62	14.76	9.48	0.23	3.61	5.77	4.16	1.08	0.21	0.00	99.90	5.24
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.63	1.59	14.91	9.55	0.23	3.79	5.91	4.15	1.02	0.21	0.00	99.87	5.18
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.11	1.45	15.84	9.29	0.23	3.51	5.99	4.23	1.08	0.16	0.00	99.88	5.31
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.99	1.57	14.68	9.53	0.23	3.75	5.80	4.16	1.05	0.22	0.00	99.87	5.21
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	59.42	1.59	14.45	9.32	0.25	3.69	5.70	4.20	1.06	0.20	0.00	99.86	5.26
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.31	1.59	14.84	9.38	0.23	3.79	5.91	4.15	1.02	0.21	0.00	99.87	5.18
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.26	1.54	15.32	9.53	0.24	3.72	5.95	4.18	1.05	0.18	0.00	99.96	5.23
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.65	1.59	14.92	9.51	0.23	3.76	5.82	4.16	1.04	0.19	0.00	99.86	5.20
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.43	1.54	15.41	9.40	0.26	3.66	5.81	4.17	0.96	0.18	0.00	99.87	5.16
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.31	1.57	15.28	9.62	0.25	3.63	5.93	4.15	1.07	0.19	0.00	99.89	5.22
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.81	1.66	14.58	9.78	0.23	3.67	5.83	4.13	1.07	0.21	0.00	99.96	5.20
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	59.61	1.51	15.28	9.52	0.26	3.58	5.70	4.17	0.95	0.22	0.00	99.87	5.15
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.85	1.54	15.69	9.89	0.22	3.57	5.80	4.21	1.10	0.20	0.00	99.87	5.31
Leuven	EDS		1210°C, 24h	G11-4	Glass		1	1210	1120	0	58.25	1.59	15.28	9.47	0.24	3.78	5.89	4.15	1.02	0.22	0.03	99.91	5.17
				Average	EDS			58.78	1.57	15.61	9.38	0.23	3.66	5.62	4.16	1.07	0.20	0.00				5.25	
				1 sigma	EDS			0.51	0.65	0.45	0.31	0.47	0.69	0.15	0.15	0.63	0.63	0.63				0.41	
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	58.52	1.58	15.13	9.76	0.23	3.76	5.67	4.36	1.08	0.19	0.00	99.87	5.04
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	58.60	1.63	15.08	9.86	0.24	3.76	5.60	3.86	1.09	0.16	0.00	99.87	4.95
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.03	1.62	14.63	9.24	0.24	3.68	5.48	3.96	1.12	0.21	0.00	99.87	5.16
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	58.71	1.63	15.21	9.65	0.24	3.72	5.55	3.89	1.12	0.17	0.00	99.88	5.01
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.23	1.70	14.51	9.88	0.24	3.76	5.47	3.81	1.11	0.19	0.00	99.89	4.92
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	58.51	1.66	14.91	9.89	0.26	3.78	5.67	3.84	1.09	0.20	0.00	99.90	4.93
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.19	1.64	14.98	9.66	0.23	3.57	5.45	3.87	1.17	0.16	0.00	99.91	5.04
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.24	1.67	14.48	9.27	0.23	3.69	5.48	3.72	1.10	0.18	0.00	99.92	5.09
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.48	1.67	14.96	9.57	0.25	3.54	5.37	3.81	1.16	0.18	0.00	99.98	4.97
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.24	1.66	15.11	9.54	0.25	3.54	5.47	3.86	1.17	0.15	0.00	99.98	5.03
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	58.66	1.63	15.37	9.50	0.22	3.72	5.64	4.00	1.09	0.18	0.00	99.90	5.09
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.24	1.62	14.82	9.34	0.24	3.73	5.44	3.88	1.14	0.18	0.00	99.98	5.01
Leuven	EDS		1210°C, 24h	G11-5	Glass		1	1210	1100	0	59.48	1.65	14.53	9.57	0.25	3.70	5.42	3.93	1.14	0.18	0.03	99.87	5.07
				Average	EDS			59.01	1.63	14.98	9.65	0.24	3.67	5.62	3.89	1.13	0.18	0.00				5.02	
				1 sigma	EDS			0.36	0.64	0.26	0.46	0.41	0.68	0.16	0.16	0.63	0.63	0.63				0.41	
Leuven	EDS		1230°C, 24h	G11-6	Glass		1	1230	1165	0	60.60	1.00	17.78	5.62	0.13	3.38	5.43	5.05	0.76	0.23	0.00	99.87	5.81
Leuven	EDS		1230°C, 24h	G11-6	Glass		1	1230															

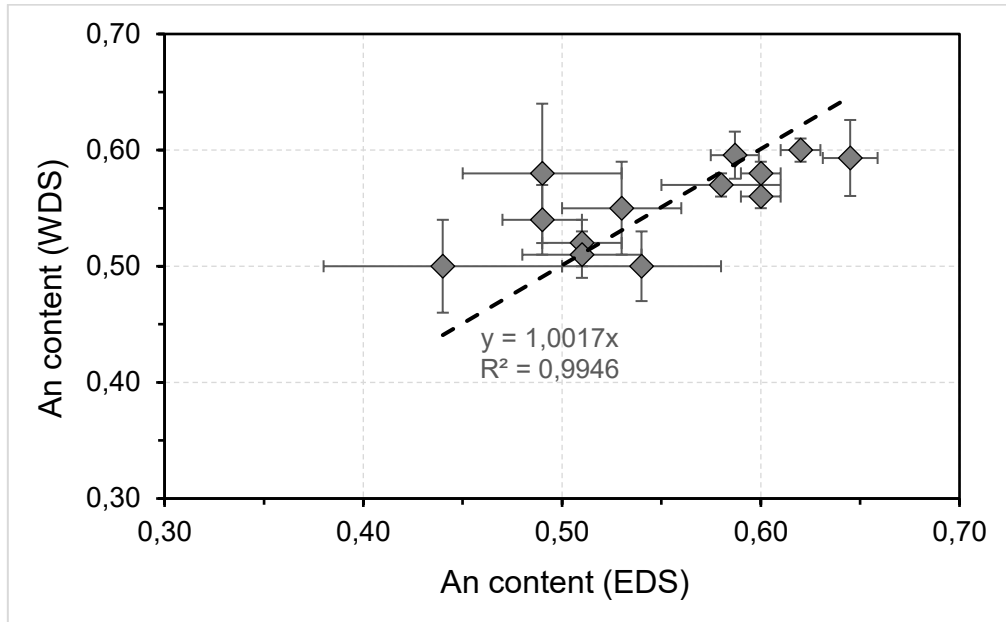
Aachen	WDS	No	G6-9	Glass	Position 2	1	1190	1120	240	69,323	1,739	14,345	9,407	0.195	3,368	4,916	4,101	1,076	0.232	0	99.70	5.18
Aachen	WDS	No	G6-9	Glass	Position 3	1	1190	1120	240	59,635	1,582	14,107	9,579	0.235	3,415	5,273	3,747	1,063	0.191	0.033	98.86	4.91
Aachen	WDS	No	G6-9	Glass	Position 4	1	1190	1120	240	59,055	1,532	14,038	9,802	0.284	3,572	5,218	3,875	1,042	0.302	0	98.82	4.92
Aachen	WDS	No	G6-9	Glass	Position 5	1	1190	1120	240	58,673	1,605	13,989	10,04	0.223	3,603	5,246	3,901	1,026	0.271	0	98.58	4.93
Aachen	WDS	No	G6-9	Glass	Position 6	1	1190	1120	240	58,451	1,632	14,05	9,908	0.232	3,695	5,37	3,847	1,046	0.251	0.079	98.56	4.89
Aachen	WDS	No	G6-9	Glass	Position 7	1	1190	1120	240	58,931	1,605	13,963	10,083	0.192	3,67	5,309	3,877	1,042	0.292	0.065	99.05	4.92
Aachen	WDS	No	G6-9	Glass	Position 8	1	1190	1120	240	58,793	1,633	13,844	9,945	0.189	3,784	5,253	4,017	1,036	0.251	0.026	98.57	5.05
Aachen	WDS	No	G6-9	Glass	Position 9	1	1190	1120	240	58,516	1,567	13,747	10,103	0.311	3,762	5,513	4,038	1,058	0.161	0	98.78	5.10
Aachen	WDS	No	G6-9	Glass	Position 10	1	1190	1120	240	58,196	1,606	13,897	10,077	0.107	3.7	5,284	4,177	1,079	0.171	0	98.29	5.26
Aachen	WDS	No	G6-9	Glass	Position 11	1	1190	1120	240	58,61	1,535	13,825	9,928	0.232	3,709	5,141	3,962	1,077	0.262	0	98.22	4.99
Aachen	WDS	No	G6-9	Glass	Position 12	1	1190	1120	240	59,12	1,571	14,018	9.71	0.257	3,652	5,052	4.01	1,079	0.191	0.068	98.66	5.09
Aachen	WDS	No	G6-9	Glass	Position 13	1	1190	1120	240	58,922	1,492	14,063	9,383	0.193	3,561	5,107	4,197	1,086	0.242	0	98.25	5.28
Aachen	WDS	No	G6-9	Glass	Position 14	1	1190	1120	240	59,522	1.52	14,225	9,566	0.211	3,506	5,105	4,141	1,077	0.151	0.022	99.05	5.29
Aachen	WDS	No	Average	WDS						59.14	1.58	14.04	9.75	0.22	3.58	5.20	3.96	1.07	0.22		98.84	5.04
Aachen	WDS	No	1 sigma	WDS						0.62	0.06	0.18	0.35	0.05	0.17	0.14	0.04	0.09	0.03		0.19	0.19
Aachen	WDS	No	G6-1	Glass	Position 1	1	1190	1165	2	57,267	1,288	16,232	8,642	0.114	3,087	6,083	4,228	0.895	0.321	0	98.26	5.11
Aachen	WDS	No	G6-1	Glass	Position 2	1	1190	1165	2	56,846	1,289	16,365	8.95	0.25	3,141	6,212	4.21	0.899	0.11	0.025	98.30	5.12
Aachen	WDS	No	G6-1	Glass	Position 3	1	1190	1165	2	56,934	1,275	16,23	8,769	0.15	2,944	6,377	4,468	0.961	0.222	0	98.22	5.43
Aachen	WDS	No	G6-1	Glass	Position 4	1	1190	1165	2	56,719	1,257	16,008	8,726	0.162	2,989	6,066	4,442	0.968	0.241	0.01	97.59	5.41
Aachen	WDS	No	G6-1	Glass	Position 5	1	1190	1165	2	56,84	1.39	16,154	8,884	0.122	3,067	5,915	4,441	0.918	0.191	0.076	98.00	5.36
Aachen	WDS	No	G6-1	Glass	Position 6	1	1190	1165	2	56,218	1,324	16,008	8,902	0.192	3,111	6,184	4,476	0.945	0.117	0	97.73	5.42
Aachen	WDS	No	G6-1	Glass	Position 7	1	1190	1165	2	56,318	1,313	15,955	8,234	0.186	3,222	6,28	4,355	0.919	0.171	0	97.95	5.27
Aachen	WDS	No	G6-1	Glass	Position 8	1	1190	1165	2	57,648	1,277	16,021	8,526	0.183	2,922	5,806	4,389	0.977	0.151	0	97.90	5.37
Aachen	WDS	No	G6-1	Glass	Position 9	1	1190	1165	2	58,124	1,281	16,463	8,271	0.108	2,818	5,898	4,275	0.989	0.262	0.019	98.60	5.29
Aachen	WDS	No	G6-1	Glass	Position 10	1	1190	1165	2	55,403	1,392	15,937	9,260	0.143	3,151	6,084	4,276	0.995	0.211	0.095	98.78	5.17
Aachen	WDS	No	Average	WDS						56.83	1.31	16.14	8.36	0.18	3.05	6.08	4.36	0.94	0.22		0.01	5.26
Aachen	WDS	No	1 sigma	WDS						0.78	0.08	0.18	0.21	0.04	0.12	0.16	0.10	0.04	0.07	0.02		0.14
Aachen	WDS	No	G6-2a1	Glass	Position 1	1	1190	1165	5	55,328	1,302	15,324	8,467	0.155	3,083	6,198	4,251	0.95	0.202	0	96.66	5.29
Aachen	WDS	No	G6-2a1	Glass	Position 2	1	1190	1165	5	56.78	1,368	15,422	8,435	0.183	3,622	6,148	4,303	0.999	0.251	0	97.41	5.20
Aachen	WDS	No	G6-2a1	Glass	Position 3	1	1190	1165	5	56,085	1,379	15,578	8,436	0.183	3,392	6,182	4,341	0.895	0.11	0.038	97.62	5.24
Aachen	WDS	No	G6-2a1	Glass	Position 4	1	1190	1165	5	56,235	1,379	15,718	9,186	0.232	3,459	6,106	4,299	0.907	0.191	0	97.77	5.21
Aachen	WDS	No	G6-2a1	Glass	Position 5	1	1190	1165	5	56	1,365	15,679	9,308	0.21	3,531	6,095	4,211	0.964	0.191	0	97.75	5.08
Aachen	WDS	No	G6-2a1	Glass	Position 6	1	1190	1165	5	56,523	1,328	15,747	9,206	0.207	3,416	6,106	4.39	0.91	0.241	0	98.07	5.30
Aachen	WDS	No	G6-2a1	Glass	Position 7	1	1190	1165	5	56,838	1,362	15,836	9,143	0.192	3,427	6,023	4,404	0.889	0.171	0	98.29	5.29
Aachen	WDS	No	G6-2a1	Glass	Position 8	1	1190	1165	5	57,208	1,369	16,306	8,953	0.207	3.3	6,095	4,383	0.953	0.208	0	98.62	5.46
Aachen	WDS	No	G6-2a1	Glass	Position 9	1	1190	1165	5	58,029	1.32	15,899	8,008	0.183	3,104	5,777	4,475	0.989	0.161	0.025	97.97	5.46
Aachen	WDS	No	Average	WDS						56.45	1.35	15.68	9.14	0.20	3.41	6.08	4.34	0.90	0.20		0.01	5.24
Aachen	WDS	No	1 sigma	WDS						0.60	0.03	0.26	0.16	0.02	0.10	0.07	0.02	0.06	0.01		0.08	0.08
Aachen	WDS	No	G6-2a2	Glass	Position 1	1	1190	1165	5	56,443	1,357	16,412	8,155	0.195	3,083	6,198	4,251	0.95	0.202	0	96.61	5.29
Aachen	WDS	No	G6-2a2	Glass	Position 2	1	1190	1165	5	57,511	1,319	16,133	8,87	0.259	3,284	6,188	4,042	0.881	0.161	0.004	98.65	4.92
Aachen	WDS	No	G6-2a2	Glass	Position 3	1	1190	1165	5	57,53	1,42	16,055	9.45	0.216	3,377	5,973	4,06	0.906	0.271	0.057	99.32	4.97
Aachen	WDS	No	G6-2a2	Glass	Position 4	1	1190	1165	5	57,047	1,393	16,062	9,249	0.232	3,125	6,277	4,277	0.921	0.161	0	98.62	5.49
Aachen	WDS	No	G6-2a2	Glass	Position 5	1	1190	1165	5	57,151	1,366	15,867	9,524	0.186	3.22	6,167	4,422	0.999	0.331	0.03	99.16	5.32
Aachen	WDS	No	G6-2a2	Glass	Position 6	1	1190	1165	5	56,797	1,338	15,796	9,482	0.162	3,368	6,189	4,346	0.882	0.221	0.052	98.64	5.24
Aachen	WDS	No	G6-2a2	Glass	Position 7	1	1190	1165	5	56,715	1,342	16,086	9.46	0.216	3,437	6,134	4.15	0.988	0.181	0.043	98.36	5.09
Aachen	WDS	No	G6-2a2	Glass	Position 8	1	1190	1165	5	57,255	1,231	15,958	9,268	0.171	3,342	6,022	4,167	0.999	0.231	0	98.45	5.07
Aachen	WDS	No	G6-2a2	Glass	Position 9	1	1190	1165	5	57,169	1,328	15,919	8,877	0.156	3,175	5,965	4,531	0.9	0.221	0	98.24	5.43
Aachen	WDS	No	G6-2a2	Glass	Position 10	1	1190	1165	5	57,055	1,363	15,979	8,591	0.177	3,081	6,573	4,284	0.894	0.281	0	98.28	5.18
Aachen	WDS	No	G6-2a2	Glass	Position 11	1	1190	1165	5	57,471	1,397	15,854	8,732	0.143	3,089	6,011	4.14	0.941	0.271	0.019	98.07	5.08
Aachen	WDS	No	G6-2a2	Glass	Position 12	1	1190	1165	5	57,698	1,291	16,088	8,472	0.147	3,139	6,052	4.19	0.972	0.241	0	98.19	5.12
Aachen	WDS	No	G6-2a2	Glass	Position 13	1	1190	1165	5	58,512	1.31	16,034	8.36	0.199	3,059	5,996	4.21	0.935	0.181	0	98.80	5.15
Aachen	WDS	No	Average	WDS						57.50	1.35	15.97	8.97	0.19	3.23	6.09	4.23	0.91	0.23		0.02	5.15
Aachen	WDS	No	1 sigma	WDS						0.74	0.05	0.16	0.47	0.04	0.12	0.18	0.14	0.02	0.06	0.02		0.16
Aachen	WDS	No	G6-3	Glass	Position 1	1	1190	1165	10	56,448	1,184	16,448	8,143	0.195	3,083	6,198	4,251	0.95	0.202	0	96.61	5.29
Aachen	WDS	No	G6-3	Glass	Position 2	1	1190	1165	10	56,506	1,291	16,488	9,777	0.165	2,951	5,991	4,381	0.942	0.037	99.76	4.71	
Aachen	WDS	No	G6-3	Glass	Position 3	1	1190	1165	10	58,122	1,323	16,523	9,468	0.173	2,937	5,991	3,858	0.857	0.231	0	99.36	4.72
Aachen	WDS	No	G6-3	Glass	Position 4	1	1190	1165	10	58,118	1,334	16,581	9,473	0.156	3,176	6,042	4,064	0.915	0.11	0.067	99.36	4.98
Aachen	WDS	No	G6-3	Glass	Position 5	1	1190	1165	10	58,069	1.35	16,619	9.58	0.201	2,934	6,173	3,975	0.906	0.141	0.007	99.85	4.68
Aachen	WDS	No	G6-3	Glass	Position 6	1	1190	1165	10	58,276	1,252	16,488	9,574	0.168	2,946	6.14	3.86	0.917	0.161	0		





EDS AND WDS

An content			
EDS	1 sigma	WDS	1 sigma
0,64	0,01	0,59	0,03
0,59	0,01	0,60	0,02
0,53	0,03	0,55	0,04
0,49	0,04	0,58	0,06
0,54	0,04	0,5	0,03
0,44	0,06	0,5	0,04
0,62	0,01	0,6	0,01
0,6	0,01	0,56	0,01
0,6	0,01	0,58	0,01
0,58	0,03	0,57	0,01
0,49	0,02	0,54	0,03
0,51	0,02	0,52	0,02
0,51	0,03	0,51	0,02



NA LOSS

Red values: correspond to important relative difference (>10 %) between Na content in our starting material, and the Na measured at the end of our runs

Observation	Sample	Type of experiment	Pre-existing crystals	temp (h)	CR (°C/h)	T _i (°C)	T _f (°C)	t _{cool} (h)	t _{iso} (h)	Pig prop.	Na content	Cpx Prop.	Na content	Glass prop.	Na content	Total	Os/36 Na content	relative diff (%)
average with/without Pig corona	GERO 0-1	ISO	Yes	24	-	1150	1150	24	24	0.14	4.86	0.00	0.00	0.96	4.08	4.19	4.32	3.03
	GERO 0-2	ISO	Yes	24	-	1175	1175	24	24	0.03	3.62	0.00	0.00	0.97	3.72	3.72		13.96
	GERO 0-6	ISO	Yes	24	-	1180	1180	24	24	0.03	3.87	0.00	0.00	0.97	3.91	3.91		9.52
	ISO	Yes	24	-	1190	1190	24	24	0.00	2.38	0.00	0.00	1.00	4.14	4.14		4.01	
		Yes	24	-	1190	1190	24	24	0.00	3.56	0.00	0.00	1.00	4.44	4.44		2.72	
		Yes	24	-	1190	1190	24	24	0.00	4.40	0.00	0.00	1.00	4.10	4.10		5.01	
		Yes	24	-	1190	1190	24	24	0.00	3.01	0.00	0.00	1.00	4.43	4.43		2.51	
	ISO	No	24	-	1200	1200	24	24	0.00	0.00	0.00	0.00	1.00	4.09	4.09		5.32	
	ISO	No	24	-	1190	1190	24	24	0.00	0.00	0.00	0.00	1.00	4.08	4.08		5.79	
	ISO	No	24	-	1180	1180	24	24	0.00	0.00	0.00	0.00	1.00	4.13	4.13		4.40	
GERO 0-10	ISO	No	24	-	1150	1150	24.00	24	0.08	4.17	0.00	0.00	0.92	3.40	3.46		19.87	
similar to crystal-free glass	GERO 1-1 (sample 1) *	Cooling	Yes	49	1	1190	1165	0.00	49.00	0.06	4.07	0.00	0.00	0.94	4.08	4.08		5.57
	GERO 1-1 (sample 2) *	Cooling	Yes	49	1	1190	1165	0.00	49.00	0.03	4.12	0.00	0.00	0.97	4.06	4.06		5.96
	GERO 1-2 *	Cooling	Yes	77	1	1190	1137	0.00	77.00	0.12	4.67	0.00	0.00	0.88	4.38	4.41		2.19
	GERO 1-3 *	Cooling	Yes	94	1	1190	1120	0.00	94.00	0.16	4.41	0.00	0.00	0.85	4.16	4.20		2.81
	GERO 1-4 *	Cooling	Yes	114	1	1190	1100	0.00	114.00	0.21	4.78	0.00	0.00	0.79	4.13	4.27		1.24
	GERO 2-1 *	Cooling	Yes	32.33	3	1190	1165	0.00	32.33	0.03	4.12	0.00	0.00	0.97	4.18	4.18		3.28
	GERO 2-1bis *	Cooling	Yes	32.33	3	1190	1165	0.00	32.33	0.00	-	0.00	0.00	1.00	-	-		-
	GERO 2-2 *	Cooling	Yes	40.67	3	1190	1140	0.00	40.67	0.11	4.24	0.00	0.00	0.89	4.00	4.03		6.80
	GERO 2-3 *	Cooling	Yes	47.33	3	1190	1120	0.00	47.33	0.11	4.11	0.00	0.00	0.85	3.83	3.90		9.78
	GERO 2-4 *	Cooling	Yes	54.00	3	1190	1100	0.00	54.00	0.20	4.49	0.00	0.00	0.80	3.82	3.95		8.47
small quench Cpx crystals not possible to measure	GERO 3-1 *	Cooling	Yes	26.78	9	1190	1165	0.00	26.78	0.01	4.24	0.00	0.00	0.99	4.22	4.22		2.31
	GERO 3-2 (sample 1) *	Cooling	Yes	29.56	9	1190	1140	0.00	29.56	0.14	4.55	0.00	0.00	0.86	4.07	4.14		4.23
	GERO 3-2 (sample 2) *	Cooling	Yes	29.56	9	1190	1140	0.00	29.56	0.09	4.76	0.00	0.00	0.91	4.27	4.31		0.14
	GERO 3-3 *	Cooling	Yes	31.78	9	1190	1120	0.00	31.78	0.14	4.93	0.00	0.00	0.86	4.03	4.16		3.80
	GERO 3-4 *	Cooling	Yes	34.00	9	1190	1100	0.00	34.00	0.24	4.83	0.00	0.00	0.76	3.94	4.15		3.85
	GERO 3-5 *	Cooling	Yes	39.56	9	1190	1050	0.00	39.56	0.39	4.89	0.15	0.69	0.42	2.79	3.29		23.75
	GERO 3-6 *	Cooling	Yes	45.11	9	1190	1000	0.00	45.11	0.48	4.43	0.31	1.11	0.21	4.43	2.98		31.00
	GERO 4-1	Cooling	Yes	25.00	25	1190	1165	0.00	25.00	0.00	3.37	0.00	0.00	1.00	4.45	4.45		2.91
	GERO 4-2	Cooling	Yes	27.60	25	1190	1100	0.00	27.60	0.23	4.57	0.00	0.00	0.77	3.85	4.02		7.05
	GERO 4-3	Cooling	Yes	29.60	25	1190	1050	0.00	29.60	0.32	5.20	0.01	0.00	0.67	3.90	4.28		1.00

Supplementary Information File 3

Table S1

Microstructural characteristics determined from image segmentation. T_i , T_f refer to the initial and final temperatures of the runs. As referred in the main text, here T_{set} refers to the beginning of nucleation of the first phase (plagioclase in our case). ΔT represents the degree of superheating relative to the onset of nucleation. ΔT_{iso} corresponds to the superheating relative to the saturation temperature measured in our isothermal runs (and in agreement with Rhyolite-MELTS predictions). ΔT_{cool} refers to the superheating considering the potential undercooling required to trigger nucleation during cooling. $-\Delta T_n$ is the nominal degree of undercooling ($-\Delta T_n = T_{\text{set}} - T_f$). We take into account the potential shift of the nucleation beginning in our calculation of $-\Delta T_n$. The duration of the final experimental step is also provided in hours ($t_{\text{final step}}$). N_p and N_A refer to bubble and plagioclase number densities. l_{mean} is the mean plagioclase crystal size measured on the entire segmented population. $l_{\text{max, av}}$ is the maximum plagioclase size, calculated as the average of the ten largest plagioclase crystals. CR and ISO correspond, respectively, to cooling rate and isothermal runs. Phase abbreviations: P.c.: pre-existing plagioclase fragments; Plg: plagioclase; Cpx: clinopyroxene; Ox: Fe-Ti oxides; gl: glass.

Red : estimated values from our runs

Sample	Type of experiments	Pre-existing crystals CR (CR)	T (°C)	T ₁ (°C)	T ₂ (°C)	T ₃ (°C)	T ₄ (°C)	T ₅ (°C)	T ₆ (°C)	T ₇ (°C)	T ₈ (°C)	T ₉ (°C)	Phases	Plagioclase texture (M.E)	log(ρ)	Global Image Diffraction (Zhang et al. 2022)	φ _v	N _p (μm ⁻³)		
Billon et al. 2025	GERO 0-1	ISO	Yes	-	1150	1150	1175	-	-	20	24	0	24	Glass, Pl	-	3.27	7.5E-14	0.14	9.0E-05	
Billon et al. 2025	GERO 0-2	ISO	Yes	-	1150	1150	1175	-	-	10	24	0	24	Glass, Pl	Resorbed	3.33	6.8E-14	0.07	2.5E-05	
Billon et al. 2025	GERO 0-5	ISO	Yes	-	1175	1175	1175	0	0	0	24	0	24	Glass, Pl	-	3.16	1.0E-13	0.03	9.7E-06	
Billon et al. 2025	GERO 0-4	ISO	Yes	-	1150	1150	1175	5	5	0	24	0	24	Glass, Pl	-	3.02	1.3E-13	0.03	1.5E-05	
Billon et al. 2025	GERO 0-4a	ISO	Yes	-	1150	1150	1175	15	15	0	24	0	24	Glass, P.c, Pl	Resorbed	-	1.3E-13	0.01	4.1E-06	
Billon et al. 2025	GERO 0-4b	ISO	Yes	-	1150	1150	1175	15	15	0	24	0	24	Glass, P.c, Pl	Resorbed	-	-	-	2.7E-06	
Billon et al. 2025	GERO 0-4c	ISO	Yes	-	1150	1150	1175	15	15	0	24	0	24	Glass, P.c, Pl	Resorbed	-	-	-	1.0E-06	
Billon et al. 2025	GERO 0-4d	ISO	Yes	-	1150	1150	1175	15	15	0	24	0	24	Glass, P.c, Pl	Resorbed	-	-	-	1.4E-06	
Billon et al. 2025	GERO 0-4e	ISO	Yes	-	1150	1150	1175	15	15	0	24	0	24	Glass, P.c, Pl	Resorbed	-	-	-	6.0E-06	
Billon et al. 2025	GERO 0-7	ISO	No	-	1450	1450	1175	275	275	0	2	0	24	Glass	-	-	-	0	8.2E-07	
Billon et al. 2025	GERO 0-8	ISO	No	-	1150	1150	1175	15	15	0	24	0	24	Glass	-	2.71	2.8E-13	0	0	
Billon et al. 2025	GERO 0-8	ISO	No	-	1150	1150	1175	15	15	0	24	0	24	Glass	-	2.78	2.3E-13	0	0	
Billon et al. 2025	GERO 0-8	ISO	No	-	1150	1150	1175	15	15	0	24	0	24	Glass	Euhedral, Elongated	2.97	1.5E-13	0	0.05	3.5E-05
Billon et al. 2025	GERO 0-9	ISO	No	-	1150	1150	1175	15	15	0	24	0	24	Glass, Pl	Euhedral, Elongated	-	-	0.05	5.5E-05	
Billon et al. 2025	GERO 0-9	ISO	No	-	1150	1150	1175	15	15	0	24	0	24	Glass, Pl	Euhedral, Elongated	3.21	8.6E-14	0.08	5.1E-06	
Billon et al. 2025	GERO 1-1 (sample 1)	Cooling	Yes	-	1150	1155	1175	15	15	10	0	25.00	49	Glass, Pl	Euhedral, TablPrism and Blocky/Elongated	3.21	8.7E-14	0.06	5.4E-06	
Billon et al. 2025	No crystal control	Cooling	-	-	1155	1175	15	15	10	0	25.00	-	-	-	-	-	-	0.01	1.4E-06	
Billon et al. 2025	GERO 1-1 (sample 2)	Cooling	Yes	1	1150	1155	1175	15	15	10	0	25.00	43.00	Glass, Pl	Euhedral, TablPrism and Blocky/Elongated	3.36	6.9E-14	0.03	2.1E-06	
Billon et al. 2025	GERO 1-2	Cooling	Yes	1	1150	1157	1175	15	15	38	0	53.00	77.00	Glass, Pl	Euhedral, TablPrism and Elongated	3.75	2.4E-14	0.12	4.2E-06	
Billon et al. 2025	GERO 1-2	Cooling	Yes	1	1150	1157	1175	15	15	55	0	70.00	94.00	Glass, Pl, Ox	Euhedral, TablPrism	3.75	2.4E-14	0.21	6.0E-06	
Billon et al. 2025	No crystal control	Cooling	-	-	1120	1157	15	15	55	0	1120	1157	15	15	55	0	0.1	0	0	
Billon et al. 2025	GERO 1-4	Cooling	Yes	1	1150	1150	1175	15	15	75	0	90.00	114.00	Glass, Pl, Ox	Euhedral, TablPrism	3.39	1.4E-14	0.21	3.1E-06	
Billon et al. 2025	GERO 2-1	Cooling	Yes	3	1150	1155	1175	15	15	10	0	5.33	32.33	Glass, Pl	Euhedral, TablPrism and Blocky/Elongated	3.38	5.7E-14	0.03	1.4E-06	
Billon et al. 2025	GERO 2-2	Cooling	Yes	3	1150	1155	1175	15	15	10	0	5.33	32.33	Glass, Pl	Euhedral, TablPrism and Blocky/Elongated	3.38	5.7E-14	0.03	1.4E-06	
Billon et al. 2025	GERO 2-3	Cooling	Yes	3	1150	1140	1175	15	15	35	0	16.67	40.67	Glass, Pl	Euhedral, TablPrism and Elongated	3.45	4.9E-14	0.11	3.0E-06	
Billon et al. 2025	GERO 2-3	Cooling	Yes	3	1150	1120	1175	15	15	55	0	23.33	47.33	Glass, Pl	Euhedral, TablPrism	3.72	2.6E-14	0.05	2.6E-06	
Billon et al. 2025	GERO 2-4	Cooling	Yes	3	1150	1150	1175	15	15	75	0	30.00	54.00	Glass, Pl, Ox	Euhedral, TablPrism	3.73	2.5E-14	0.2	1.6E-06	
Billon et al. 2025	GERO 3-1	Cooling	Yes	9	1150	1155	1175	15	15	10	0	2.78	28.78	Glass, Pl	Euhedral, TablPrism and Blocky	3.4	5.6E-14	0.01	1.7E-06	
Billon et al. 2025	GERO 3-1	Cooling	Yes	9	1150	1140	1175	15	15	35	0	5.56	29.56	Glass, Pl	Euhedral/Hopper, TablPrism and Elongated	3.54	4.0E-14	0.04	3.5E-06	
Billon et al. 2025	GERO 3-1	Cooling	Yes	9	1150	1140	1175	15	15	35	0	5.56	29.56	Glass, Pl	Euhedral/Hopper, TablPrism and Elongated	3.52	4.2E-14	0.09	1.6E-06	
Billon et al. 2025	GERO 3-2	Cooling	Yes	9	1150	1120	1175	15	15	55	0	7.78	31.78	Glass, Pl	Euhedral, TablPrism and Elongated	3.6	3.4E-14	0.14	5.0E-07	
Billon et al. 2025	GERO 3-2	Cooling	Yes	9	1150	1120	1175	15	15	55	0	7.78	31.78	Glass, Pl	Hopper/Suicidal, TablPrism	-	-	0.05	1.9E-06	
Billon et al. 2025	GERO 3-2	Cooling	Yes	9	1150	1120	1175	15	15	55	0	10.00	34.00	Glass, Pl, Ox	Euhedral, TablPrism	3.82	1.6E-14	0.14	3.2E-06	
Billon et al. 2025	GERO 3-5	Cooling	Yes	9	1150	1150	1175	15	15	125	0	15.56	39.56	Glass, Pl, Ox, Cpx	Euhedral, TablPrism	5.34	5.9E-16	0.39	3.0E-06	
Billon et al. 2025	GERO 3-6	Cooling	Yes	9	1150	1150	1175	15	15	175	0	23.11	45.11	Glass, Pl, Ox, Cpx	Euhedral, TablPrism	7.25	7.0E-16	0.49	1.7E-06	
Billon et al. 2025	GERO 4-1	Cooling	Yes	25	1150	1155	1175	15	15	10	0	1.00	25.00	Glass, Plg	Resorbed, TablPrism	3.31	6.9E-15	0.004	3.3E-07	
Billon et al. 2025	GERO 4-2	Cooling	Yes	25	1150	1150	1175	15	15	75	0	3.60	27.60	Glass, Plg	Suicidal/Skeletal, TablPrism and Elongated	3.34	1.5E-14	0.23	2.4E-06	
Billon et al. 2025	GERO 4-3	Cooling	Yes	25	1150	1150	1175	15	15	125	0	5.50	29.50	Glass, Pl, Cpx	Suicidal/Skeletal, TablPrism and Elongated	4.01	6.3E-15	0.32	2.1E-06	
Billon et al. 2025	GERO 5-1	Cooling	Yes	125	1150	1155	1175	15	15	53	-27.5	0	6.25	24.25	Glass, P.c, Pl	Resorbed	-	-	0.0004	9.5E-07
Billon et al. 2025	GERO 5-2 (sample 1)	Cooling	Yes	125	1150	1155	1175	15	15	53	-27.5	0	6.25	24.25	Glass, Pl	Suicidal/Skeletal, Prism and Elongated	3.82	2.0E-14	0.04	1.6E-06
Billon et al. 2025	GERO 5-2 (sample 2)	Cooling	Yes	125	1150	1155	1175	15	15	53	-27.5	0	6.25	24.25	Glass, Pl	Suicidal/Skeletal, Prism and Elongated	3.84	3.0E-14	0.08	3.2E-06
Billon et al. 2025	GERO 5-3	Cooling	Yes	125	1150	1155	1175	15	15	53	-27.5	0	6.25	24.25	Glass, Pl	Suicidal/Skeletal, Prism and Elongated	4.21	6.0E-15	0.36	4.1E-07
Billon et al. 2025	GERO 6-1	Cooling and ISO	Yes	1	1150	1155	1175	15	15	10	2	25.00	50.00	Glass, Pl	Euhedral, TablPrism and Blocky	-	-	0.01	2.3E-07	
Billon et al. 2025	GERO 6-2 (sample 1)	Cooling and ISO	Yes	1	1150	1155	1175	15	15	10	5	25.00	54.00	Glass, Pl	Euhedral, TablPrism	3.23	8.3E-14	0.05	6.0E-06	
Billon et al. 2025	GERO 6-2 (sample 2)	Cooling and ISO	Yes	1	1150	1155	1175	15	15	10	5	25.00	54.00	Glass, Pl	Euhedral, TablPrism and Elongated	3.23	8.3E-14	0.04	2.9E-07	
Billon et al. 2025	GERO 6-3	Cooling and ISO	Yes	1	1150	1155	1175	15	15	10	5	25.00	54.00	Glass, Pl	Euhedral, TablPrism	3.42	5.3E-14	0.03	6.0E-06	
Billon et al. 2025	GERO 6-4	Cooling and ISO	Yes	1	1150	1155	1175	15	15	10	24	25.00	73.00	Glass, Pl	Euhedral (few hopper), TablPrism and Elongated	3.55	5.9E-14	0.04	2.1E-07	
Billon et al. 2025	GERO 6-5	Cooling and ISO	Yes	1	1150	1120	1175	15	15	55	2	70.00	86.00	Glass, Pl	Euhedral, TablPrism	-	-	0.05	6.0E-06	
Billon et al. 2025	GERO 6-6	Cooling and ISO	Yes	1	1150	1120	1175	15	15	55	5	70.00	93.00	Glass, Pl, Ox	Euhedral (few hopper), TablPrism	3.73	2.5E-14	0.18	6.0E-06	
Billon et al. 2025	GERO 6-7	Cooling and ISO	Yes	1	1150	1120	1175	15	15	55	10	70.00	94.00	Glass, Pl	Euhedral (few hopper), TablPrism	3.76	2.2E-14	0.19	6.0E-06	
Billon et al. 2025	GERO 6-8	Cooling and ISO	Yes	1	1150	1120	1175	15	15	55	24	70.00	118.00	Glass, Pl	Euhedral (few hopper), TablPrism	3.76	2.3E-14	0.18	6.0E-06	
Billon et al. 2025	GERO 6-9	Cooling and ISO	Yes	1	1150	1120	1175	15	15	55	240	70.00	334.00	Glass, Pl, Ox	Euhedral, TablPrism	3.85	1.9E-14	0.19	6.0E-06	
Billon et al. 2025	GERO 6-10	Cooling and ISO	Yes	9	1150	1155	1175	15	15	5	2.78	31.78	Glass, Pl	Euhedral, TablPrism and Blocky/Elongated	-	-	0.03	1.2E-06		
Billon et al. 2025	GERO 6-11	Cooling and ISO	Yes	9	1150	1155	1175	15	15	10	2.78	31.78	Glass, Pl	Euhedral, TablPrism and Blocky/Elongated	-	-	0.04	2.0E-06		
Billon et al. 2025	GERO 6-12	Cooling and ISO	Yes	9	1150	1120	1175	15	15	55	10	7.78	41.78	Glass, Pl	Hopper/Suicidal, TablPrism	3.70	2.7E-14	0.17	6.0E-06	
Billon et al. 2025	GERO 6-13	Cooling and ISO	Yes	9	1150	1120	1175	15	15	55	24	7.78	50.78	Glass, Pl	Hopper/Suicidal, TablPrism	3.82	2.8E-14	0.20	1.6E-06	
Billon et al. 2025	GERO 6-14	Cooling and ISO	Yes	9	1150	1120	1175	15	15	55	264	7.78	295.78	Glass, Pl	Euhedral (few hopper), TablPrism	3.80	1.7E-14	0.18	6.0E-07	
Billon et al. 2025	GERO 6-15	Cooling and ISO	Yes	9	1150	1120	1175	15	15	55	384	7.78	457.78	Glass, Pl, quenched Cpx	-	4.02	1.3E-14	0.19	1.2E-06	
Billon et al. 2025	GERO 6-16 a)	Cooling and ISO	Yes	9	1150	1120	1175	15	15	55	744	7.78	775.78	Glass, Pl, Cpx	-	4.03	1.2E-14	0.21	6.0E-06	
Billon et al. 2025	GERO 6-16 a2	Cooling and ISO	Yes	9	1150	1120	1175	15	15	55	744	7.78	775.78	Glass, Pl, Cpx	-	4.19	9.8E-15	0.22	6.0E-06	
Billon et al. 2025	GERO 6-17	Cooling and ISO	No	1	1210	1120	1175	15	15	55	24	70	119	Glass, Pl	Skeletal, Elongated	-	-	0	0	
Billon et al. 2025	GERO 7-1	Cooling	No	1	1150	1155	1175	15	15	10	0	25.00	49.00	Glass, Pl	Euhedral, TablPrism and Elongated	3.05	1.2E-13	0.01	6.0E-06	
Billon et al. 2025	GERO 7-2	Cooling	No	1	1150	1140	1175	15	15	35	0	50.00	74.00	Glass, Pl	Suicidal, TablPrism and Elongated	3.28	7.3E-14	0.07	6.0E-06	
Billon et al. 2025	GERO 7-3	Cooling	No	1	1150	1120	1175	15	15	55	0	70.00	94.00	Glass, Pl	Su					

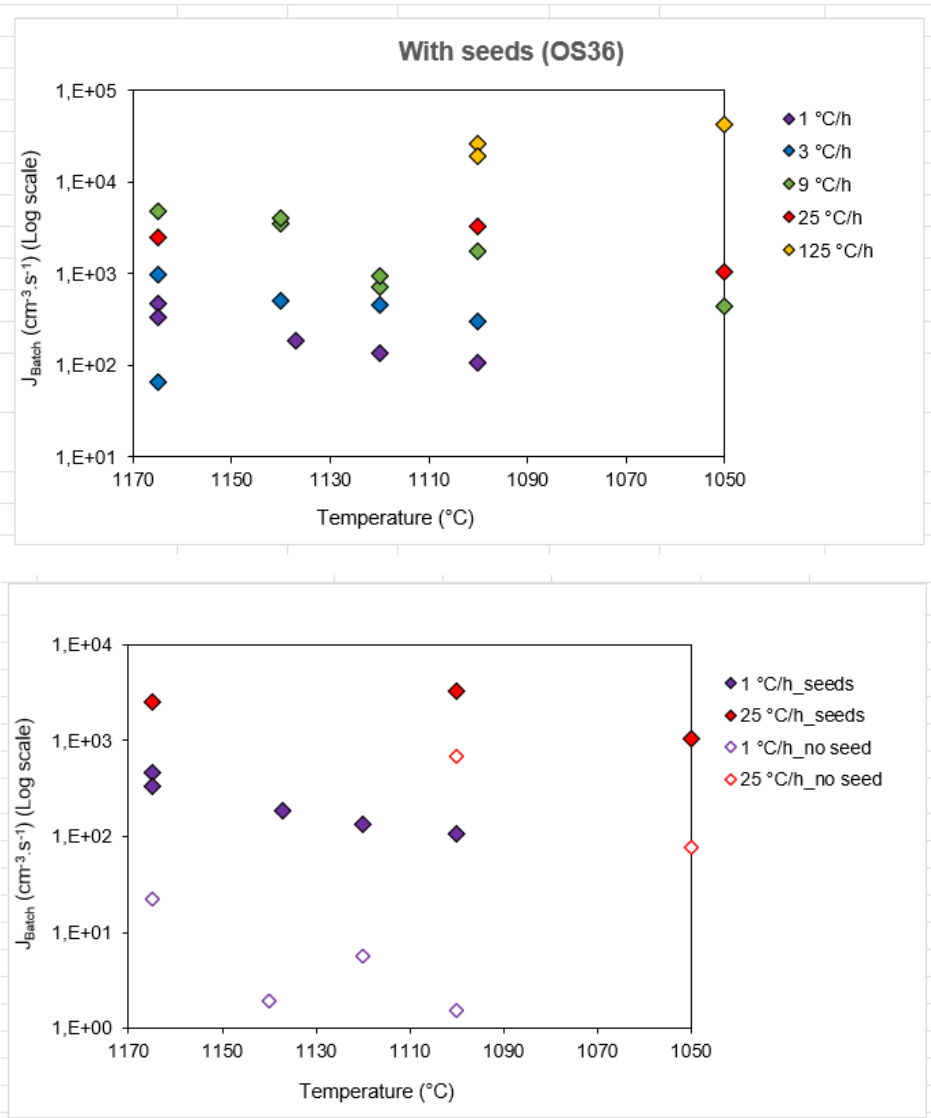
Segmented population					
Sn (μm)	L _{min} (μm)	L _{max} ^(M) (μm)	L _{min} /L _{max}	2D aspect ratio mode	2D aspect ratio median (mean)
8	9	32	2,91E-01	0.6 - 0.7	0.6 (0.65)
11	9,910719	35,9121	2,76E-01	-	-
11	13,04	45	2,93E-01	-	-
11	12,30	54	2,27E-01	-	-
9	11,12	28	4,01E-01	-	-
11	16,05	36	4,46E-01	0.6 - 0.8	0.6 (0.64)
			-	0.6 - 0.7	0.61 (0.66)
			-	0.6 - 0.7	0.59 (0.63)
			-	0.6 - 0.8	0.62 (0.65)
			-	0.6 - 0.8	0.61 (0.65)
0,00		0	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
4	5,21	15	3,52E-01	0.3 - 0.4	0.29 (0.37)
2	5,81	17	3,36E-01	0.2 - 0.3	0.28 (0.36)
2	5,45	17	3,12E-01	0.2 - 0.3	0.28 (0.36)
15,00	21,33	87	2,45E-01	0.7 - 0.8	0.51 (0.55)
11,00	11,72	25	4,69E-01		0.59 (0.61)
13,00	20,85	68	3,07E-01	0.6 - 0.7	0.52 (0.57)
17,00	19,93	114	1,75E-01	0.5 - 0.7	0.52 (0.56)
20,00	22,35	130	1,72E-01	0.6 - 0.7	0.48 (0.52)
14,00	-	-	-	0.6 - 0.7	0.54 (0.56)
20,00	24,95	183	1,36E-01	0.6 - 0.7	0.47 (0.52)
14,00	15,86	60	2,64E-01	0.6 - 0.7	0.47 (0.52)
15,00	22,65	35	6,47E-01	-	-
17,00	23,17	135	1,72E-01	0.6 - 0.7	0.46 (0.48)
17,00	22,45	127	1,77E-01	0.5 - 0.6	0.45 (0.5)
20,00	26,03	156	1,67E-01	0.5 - 0.6	0.44 (0.48)
8,00	9,22	31	2,97E-01	0.7 - 0.8	0.52 (0.57)
14,00	14,44	113	1,28E-01	0.6 - 0.7	0.43 (0.49)
12,00	17,66	103	1,71E-01	0.6 - 0.7	0.47 (0.51)
21,00	28,23	187	1,51E-01	0.5 - 0.6	0.39 (0.44)
19,00	23,70	140	1,69E-01	0.4 - 0.5	0.39 (0.44)
17,00	18,89	126	1,50E-01	0.5 - 0.7	0.45 (0.49)
26	35,34	133	2,66E-01	0.1 - 0.2	0.36 (0.42)
-	35,37	103	3,43E-01	0.3 - 0.4	0.4 (0.48)
10	13,21	31	4,26E-01	0.6 - 0.7	0.58 (0.6)
19	20,73	135	1,54E-01	0.4 - 0.5	0.39 (0.44)
26	39,15	222	1,76E-01	0.1 - 0.2	0.32 (0.41)
12	16,90	24	7,04E-01	-	-
11	15,90	83	1,92E-01	0.2 - 0.3	0.39 (0.45)
14	18,70	92	2,03E-01	0.3 - 0.4	0.37 (0.44)
15	25,07	203	1,23E-01	0.2 - 0.3	0.34 (0.42)
19	27,61	66	4,18E-01	0.6 - 0.7	0.52 (0.58)
18	27,26	83	3,28E-01	0.7 - 0.8	0.51 (0.54)
18	27,31	114	2,40E-01	0.6 - 0.7	0.54 (0.57)
23	33,66	96	3,51E-01	0.6 - 0.7	0.51 (0.53)
29	42,40	131	3,24E-01	0.6 - 0.7	0.53 (0.57)
31	49,23	195	2,52E-01	0.6 - 0.7	0.46 (0.5)
38	58,35	221	2,64E-01	0.6 - 0.7	0.48 (0.51)
44	77,61	268	2,90E-01	0.6 - 0.7	0.44 (0.48)
37	67,97	297	2,29E-01	0.4 - 0.5	0.4 (0.46)
36	58,76	254	2,31E-01	0.5 - 0.6	0.47 (0.48)
15	21,96	103	2,13E-01	0.6 - 0.7	0.4 (0.49)
19	31,04	114	2,72E-01	0.3 - 0.4	0.44 (0.49)
29	49,07	271	1,81E-01	0.1 - 0.2	0.36 (0.43)
31	58,39	271	2,15E-01	0.1 - 0.2	0.34 (0.42)
25	50,58	239	2,12E-01	0.1 - 0.3	0.36 (0.43)
24	44,71	236	1,89E-01	0.1 - 0.2	0.39 (0.45)
24	46,21	258	1,79E-01	0.1 - 0.2	0.37 (0.44)
27	48,17	237	2,03E-01	0.1 - 0.2	0.4 (0.45)
129	371,35	1354	2,74E-01	-	-
21	52,35	142	3,69E-01	-	-
65	153,80	274	5,61E-01	-	-
56	120,92	380	3,18E-01	0.1 - 0.2	0.15 (0.32)
80	115,72	372	3,11E-01	0 - 0.1	0.23 (0.34)
77	210,20	576	3,65E-01	0.1 - 0.2	0.12 (0.24)
59	141,24	404	3,50E-01	0.1 - 0.2	0.14 (0.24)
0	0,00	0	-	-	-
37	127,96	294	4,35E-01	0 - 0.2	0.08 (0.19)
82	230,29	491	4,69E-01	0.1 - 0.2	0.10 (0.17)
0	0,00	0	-	-	-
0	0,00	0	-	-	-
0	0,00	0	-	-	-
86	445,00	644	6,91E-01	-	-
169	643,94	1116	5,77E-01	-	-
118	419,75	1039	3,82E-01	-	-
155	476,77	1124	4,24E-01	-	-
0	0,00	0	-	-	-
133	386,69	1218	3,17E-01	0 - 0.1	0.07 (0.2)

G AND J RATES

Table S2

Nucleation and Growth rates calculated from our experiments.

Sample	Type of experiments	Pre-existing crystals	CR (°C/h)	Ln CR	T _i (°C)	T _f (°C)	ΔT (°C)	-ΔTn (°C)	t _{0.01} (h)	t _{0.05} (h)	t _{0.1} (h)	GBatch	Gmean, I			Gmax, I			Growth rate (cm/s): from 1190 °C						ratio: 1175 °C/1190 °C					
													GBatch	Gmean, I	Gmax, I	GBatch	Gmean, I	Gmax, I	GBatch	Gmean, I	Gmax, I	GBatch	Gmean, I	Gmax, I						
GERO 0-1	ISO	Yes	-	-	1150	1150	0	20	24	0	24	4,44E-09	5,32E-09	1,83E-08	3,58E+01	-	-	-	-	-	-	-	-	-	-					
	ISO	Yes	-	-	1160	1160	0	10	24	0	24	6,43E-09	5,74E-09	2,08E-08	5,69E+01	-	-	-	-	-	-	-	-	-	-					
	ISO	Yes	-	-	1175	1175	0	0	24	0	24	6,45E-09	7,55E-09	2,58E-08	2,51E+02	-	-	-	-	-	-	-	-	-	-					
	ISO	Yes	-	-	1180	1180	5	-5	24	0	24	6,46E-09	7,12E-09	3,14E-08	2,50E+02	-	-	-	-	-	-	-	-	-	-					
	ISO	Yes	-	-	1185	1185	10	-10	24	0	24	5,12E-09	6,43E-09	1,60E-08	1,67E+02	-	-	-	-	-	-	-	-	-	-					
	ISO	Yes	-	-	1190	1190	15	-15	24	0	24	6,53E-09	9,29E-09	2,08E-08	2,29E+01	-	-	-	-	-	-	-	-	-	-					
	ISO	No	-	-	1450	1450	275	-275	2	0	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GERO 0-7	ISO	No	-	-	1200	1200	25	-20	24	0	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	ISO	No	-	-	1190	1190	15	-15	24	0	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	ISO	No	-	-	1180	1180	5	-5	24	0	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
GERO 0-8	ISO	No	-	-	1170	1170	-	10	24	0	24	2,03E-09	3,02E-09	8,58E-09	1,35E+04	-	-	-	-	-	-	-	-	-	-					
	ISO	No	-	-	1160	1160	-	20	24	0	24	1,43E-09	3,36E-09	1,00E-08	3,87E+04	-	-	-	-	-	-	-	-	-	-					
	ISO	No	-	-	1150	1150	-	30	24	0	24	1,37E-09	3,16E-09	1,01E-08	7,09E+04	-	-	-	-	-	-	-	-	-	-					
GERO 0-9	ISO	No	-	-	1140	1140	-	20	24	0	24	1,43E-09	3,36E-09	1,00E-08	3,87E+04	-	-	-	-	-	-	-	-	-	-					
	ISO	No	-	-	1130	1130	-	30	24	0	24	1,37E-09	3,16E-09	1,01E-08	7,09E+04	-	-	-	-	-	-	-	-	-	-					
GERO 1-1 (sample 1)	Cooling	Yes	1	0	1190	1165	15	10	0	25,00	49	2,08E-08	2,96E-08	1,21E-07	4,70E+02	8,33E-09	1,18E-08	4,83E-08	2,50	2,50	2,50	2,50	2,50	2,50	2,50					
	No crystal corona ¹	Cooling	-	1	-	1165	15	10	0	25,00	-	1,53E-08	1,63E-08	3,47E-08	2,39E+02	6,11E-09	6,51E-09	1,39E-08	2,50	2,50	2,50	2,50	2,50	2,50	2,50					
GERO 1-1 (sample 2)	Cooling	Yes	1	0	1190	1165	15	10	0	25,00	49,00	1,81E-08	2,90E-08	9,44E-08	3,36E+02	7,22E-09	1,16E-08	3,78E-08	2,50	2,50	2,50	2,50	2,50	2,50	2,50					
	Cooling	Yes	1	0	1190	1137	15	38	0	53,00	77,00	6,21E-09	7,28E-09	4,17E-08	3,86E+01	4,45E-09	5,22E-09	2,99E-08	1,39	1,39	1,39	1,39	1,39	1,39	1,39					
GERO 1-3	Cooling	Yes	1	0	1190	1120	15	55	0	70,00	94,00	5,05E-09	5,64E-09	3,28E-08	1,34E+02	3,97E-09	4,43E-09	2,58E-08	1,27	1,27	1,27	1,27	1,27	1,27	1,27					
	No crystal corona ¹	Cooling	-	-	-	1120	15	55	0	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-	-	-	-	-	-	-	-	-	-					
GERO 1-4 ¹	Cooling	Yes	1	0	1190	1100	15	75	0	90,00	114,00	3,70E-09	4,62E-09	3,39E-08	1,07E+02	3,09E-09	3,85E-09	2,82E-08	1,20	1,20	1,20	1,20	1,20	1,20	1,20					
	Cooling	Yes	3	1,10	1190	1165	15	10	0	8,33	32,33	5,83E-08	6,61E-08	2,50E-07	9,67E+01	2,33E-08	2,64E-08	1,00E-07	2,50	2,50	2,50	2,50	2,50	2,50	2,50					
GERO 2-1b1 ¹	Cooling	Yes	3	1,10	1190	1165	15	10	0	8,33	32,33	6,25E-08	9,44E-08	1,46E-07	6,83E+01	2,50E-08	3,77E-08	5,83E-08	2,50	2,50	2,50	2,50	2,50	2,50	2,50					
	Cooling	Yes	3	1,10	1190	1140	15	35	0	16,67	40,67	2,02E-08	2,76E-08	1,61E-07	5,12E+01	1,42E-08	1,93E-08	1,12E-07	1,43	1,43	1,43	1,43	1,43	1,43	1,43					
GERO 2-3 ¹	Cooling	Yes	3	1,10	1190	1120	15	55	0	23,33	47,33	1,29E-08	1,70E-08	9,62E-08	4,50E+02	1,02E-08	1,34E-08	7,56E-08	1,27	1,27	1,27	1,27	1,27	1,27	1,27					
	Cooling	Yes	3	1,10	1190	1100	15	75	0	30,00	54,00	1,11E-08	1,45E-08	8,67E-08	3,00E+02	9,26E-09	1,20E-08	7,22E-08	1,20	1,20	1,20	1,20	1,20	1,20	1,20					
GERO 3-1 ¹	Cooling	Yes	9	2,20	1190	1165	15	10	0	2,78	26,78	1,00E-07	1,15E-07	3,88E-07	4,80E+01	4,00E-08	4,61E-08	1,55E-07	2,50	2,50	2,50	2,50	2,50	2,50	2,50					
	Cooling	Yes	9	2,20	1190	1140	15	35	0	5,56	29,56	5,00E-08	5,16E-08	4,04E-07	3,57E+01	3,50E-08	3,61E-08	2,82E-07	1,43	1,43	1,43	1,43	1,43	1,43	1,43					
GERO 3-2 (sample 1)	Cooling	Yes	9	2,20	1190	1140	15	35	0	5,56	29,56	4,29E-08	6,31E-08	3,68E-07	4,11E+01	3,00E-08	4,41E-08	2,57E-07	1,43	1,43	1,43	1,43	1,43	1,43	1,43					
	Cooling	Yes	9	2,20	1190	1120	15	55	0	7,78	31,78	4,77E-08	6,42E-08	4,25E-07	7,19E+01	3,75E-08	5,04E-08	3,34E-07	1,27	1,27	1,27	1,27	1,27	1,27	1,27					
GERO 3-3 ¹	Cooling	Yes	9	2,20	1190	1120	15	55	0	7,78	31,78	4,32E-08	5,38E-08	3,18E-07	8,66E+01	3,96E-08	4,23E-08	2,50E-07	1,27	1,27	1,27	1,27	1,27	1,27	1,27					
	Cooling	Yes	9	2,20	1190	1100	15	75	0	10,00	34,00	2,83E-08	3,15E-08	2,10E-07	1,77E+01	2,36E-08	2,62E-08	1,75E-07	1,20	1,20	1,20	1,20	1,20	1,20	1,20					
GERO 3-5 ¹	Cooling	Yes	9	2,20	1190	1050	15	125	0	15,56	39,56	2,60E-08	3,53E-08	1,33E-07	4,34E+02	2,32E-08	3,15E-08	1,19E-07	1,12	1,12	1,12	1,12	1,12	1,12	1,12					
	Cooling	Yes	9	2,20	1190	1000	15	175	0	21,11	45,11	0,00E+00	2,53E-08	7,36E-08	0,00E+00	0,00E+00	2,33E-08	6,77E-08	-	1,09	1,09	1,09	1,09	1,09	1,09					
GERO 4-1	Cooling	Yes	25	3,22	1190	1165	15	10	0	1,00	25,00	3,58E-07	4,59E-07	1,08E-06	2,53E+01	-	-	-	-	-	-	-	-	-	-					
	Cooling	Yes	25	3,22	1190	1100	15	75	0	3,60	27,60	8,60E-08	9,60E-08	6,25E-07	3,33E+01	2,32E-08	3,15E-08	1,19E-07	1,12	1,12	1,12	1,12	1,12	1,12	1,12					
GERO 4-3	Cooling	Yes	25	3,22	1190	1050	15	125	0	5,60	29,60	7,17E-08	1,09E-07	6,18E-07	1,04E+01	-	-	-	-	-	-	-	-	-	-					
	Cooling	Yes	125	4,83	1190	1165	15	-27,5	0	0,20	24,20	2,02E-06	2,93E-06	4,17E-06	0,00E+00	-	-	-	-	-	-	-	-	-	-					
GERO 5-1	Cooling	Yes	125	4,83	1190	1100	15	87,5	0	0,72	24,72	2,59E-07	3,68E-07	1,52E-06	2,65E+04	-	-	-	-	-	-	-	-	-	-					
	Cooling	Yes	125	4,83	1190	1100	15	87,5	0	0,72	24,72	3,29E-07	4,33E-07	2,13E-06	1,93E+04	-	-	-	-	-	-	-	-	-	-					
GERO 5-3	Cooling	Yes	125	4,83	1190	1050	15	87,5	0	1,12	25,12	2,08E-07	3,48E-07	2,82E-06	4,28E+04	-	-	-	-	-	-	-	-	-	-					
	Cooling	Yes	125	4,83	1190	1050	15	87,5	0	1,12	25,12	2,08E-07	3,48E-07	2,82E-06	4,28E+04	-	-	-	-	-	-	-	-	-	-					
GERO 6-1	Cooling and ISO	Yes	1	0,00	1190	1165	15	10	2	25,00	51,00	5,38E-08	1,10E-07	2,85E-07	1,01E+01	3,20E-08	3,12E+01	-	-	-	-	-	-	-	-					
	Cooling and ISO	Yes	1	0,00	1190	1165	15	10	5	25,00	54,00	2,25E-09	1,62E-09	7,07E-08	6,03E+01	2,52E-08	5,04E-08	3,34E-07	1,27	1,27	1,27	1,27	1,27	1,27	1,27					
GERO 6-2 (sample 1)	Cooling and ISO	Yes	1	0,00	1190	1165	15	10	5	25,00	54,00	1,73E-09	1,39E-09	2,22E-07	5,46E+02	2,53E-08	1,54E+02	-	-	-	-	-	-	-	-					
	Cooling and ISO	Yes	1	0,00	1190	1165	15	10	10	25,00	59,00	1,31E-08	1,76E-08	5,00E-08	2,58E+02	2,34E-08	3,61E+01	-	-	-	-	-	-	-	-					
GERO 6-4	Cooling and ISO	Yes	1	0,00	1190	1165	15	10	24	25,00	75,00	5,52E-09	8,67E-09	3,47E-08	2,17E+01	1,73E-08	1,23E+01	-	-	-	-	-	-	-	-					
	Cooling and ISO	Yes	1	0,00	1190	1120	15	55	2	70,00	96,00	7,81E-08	1,87E-07	4,51E-07	1,93E+01	1,26E-08	2,65E+01	-	-	-	-	-	-	-	-					
GERO 6-5	Cooling and ISO	Yes	1	0,00	1190	1120	15	55	5	70,00	99,00	3,34E-08	4,22E-08	1,20E-07	1,92E+02	1,35E-08	1,55E+01	-	-	-	-	-	-	-	-					
	Cooling and ISO	Yes	1	0,00	1190	1120	15	55	10	70,00	104,00	1,87E-08	5,55E-08	1,31E-07	6,80E+01	1,66E-08	9,08E+00	-	-	-	-	-	-	-	-					
GERO 6-6	Cooling and ISO	Yes	1	0,00	1190	1120	15	55	24	70,00	118,00	7,74E-09	9,56E-09	2,88E-08	5,17E+01	1,13E-08	1,31E+01	-	-	-	-	-	-	-	-					
	Cooling and ISO	Yes	1	0,00	1190	1120	15	55	240	70,00	334,00	7,28E-11	5,92E-10	2,76E-09	3,75E-01	2,77E-09	3,78E-04	-	-	-	-	-	-	-	-					
GERO 6-10	Cooling and ISO	Yes	9	2,20	1190	1165	15	15	5	2,78	31,78	1,96E-08	3,54E-08	2,00E-07	5,78E+02</															

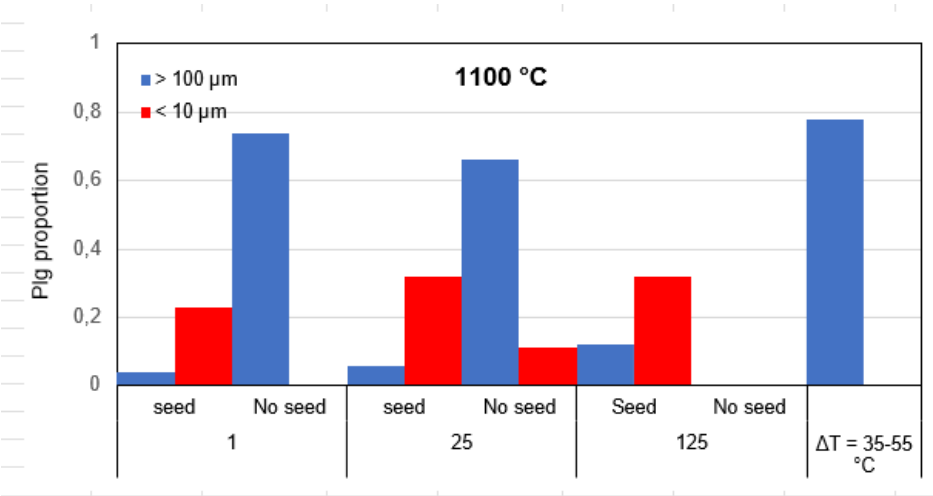


SIZE PROPORTION

Table S4

Crystal proportions for each plagioclase size range

Sample	Seeds	CR (°C/h)	T _i (°C)	T _f (°C)	t _{final} step (h)	Plagioclase proportion				
						> 100 μm	50-100 μm	30-50 μm	10-30 μm	< 10 μm
G 0	Yes	-	1190	1190	24	0	0	0,08	0,7	0,22
	Yes	-	1185	1185	24					
	Yes	-	1180	1180	24					
	Yes	-	1175	1175	24					
	Yes	-	1160	1160	24					
	Yes	-	1150	1150	24					
	No		1170	1170	24					
	No		1160	1160	24					
	No		1150	1150	24					
GERO 1-1 (sample 1)	Yes	1	1190	1165	0	<0,01	0,07	0,13	0,6	0,2
No Plg crown	Yes	1	1190	1165	0	0	0	0,02	0,59	0,39
GERO 1-1 (sample 2)	Yes	1	1190	1165	0	0	0,05	0,15	0,58	0,21
GERO 1-2	Yes	1	1190	1137	0	0	0,05	0,14	0,52	0,29
GERO 1-3	Yes	1	1190	1120	0	0,02	0,09	0,09	0,5	0,3
GERO 1-4	Yes	1	1190	1100	0	0,01	0,1	0,14	0,52	0,23
GERO 3-1	Yes	9	1190	1165	0	0	0	0,02	0,3	0,68
GERO 3-2 (Sample 1)	Yes	9	1190	1140	0	0	0,05	0,11	0,46	0,38
GERO 3-2 (Sample 2)	Yes	9	1190	1140	0	0	0,02	0,09	0,44	0,45
GERO 3-3 (Sample 1)	Yes	9	1190	1120	0	0,02	0,14	0,19	0,37	0,28
GERO 3-3 (Sample bis)	Yes	9	1190	1120	0	0,02	0,09	0,15	0,38	0,36
GERO 3-4	Yes	9	1190	1100	0	0,01	0,06	0,12	0,46	0,36
GERO 3-5	Yes	9	1190	1050	0	0,03	0,19	0,23	0,47	0,08
GERO 3-6	Yes	9	1190	1000	0	0,01	0,18	0,32	0,48	0,01
GERO 4-1	Yes	25	1190	1165	0	0	0	0,03	0,55	0,41
GERO 4-2	Yes	25	1190	1100	0	0,01	0,06	0,12	0,49	0,32
GERO 4-3	Yes	25	1190	1050	0	0,08	0,19	0,22	0,36	0,16
GERO 5-1	Yes	125	1190	1165	0	-	-	-	-	-
GERO 5-2 (sample 1)	Yes	125	1190	1100	0	0	0,03	0,07	0,53	0,37
GERO 5-2 (sample 2)	Yes	125	1190	1100	0	0,01	0,07	0,1	0,48	0,34
GERO 5-3	Yes	125	1190	1050	0	0,02	0,08	0,13	0,55	0,22
GERO 7-1	No	1	1190	1165	0	0,17	0,19	0,28	0,28	0,08
GERO 7-2	No	1	1190	1140	0	0,43	0,18	0,29	0,07	0,04
GERO 7-3	No	1	1190	1120	0	0,44	0,2	0,11	0,16	0,08
GERO 7-4	No	1	1190	1100	0	0,44	0,24	0,1	0,11	0,11
GERO 7-5	No	9	1190	1050	0	0,71	0,14	0,08	0,04	0,04
GERO 7-6	No	9	1190	1000	0	0,6	0,3	0,07	0,02	0,01
GERO 8-1	No	25	1190	1165	0	-	-	-	-	-
GERO 8-2	No	25	1190	1100	0	0,56	0,22	0,07	0,04	0,11
GERO 8-3	No	25	1190	1050	0	0,79	0,12	0,06	0,01	0,02
GERO 9-1	No	125	1190	1165	0	-	-	-	-	-
GERO 9-2	No	125	1190	1050	0	-	-	-	-	-
GERO 9-1	No	1	1210	1165	0	-	-	-	-	-
GERO 9-2	No	1	1210	1140	0	1	-	-	0	0
GERO 9-3	No	1	1210	1130	0	0,77	0,08	0,15	0	0
GERO 9-4	No	1	1210	1120	0	0,82	0,18	0	0	0
GERO 9-5	No	1	1210	1100	0	0,77	0	0	0,23	0
GERO 9-6	No	1	1230	1165	0	-	-	-	-	-
GERO 9-7	No	1	1230	1100	0	0,71	0,16	0,1	0,03	0
GERO 6-1	Yes	1	1190	1165	2	0	0,13	0,25	0,52	0,1
GERO 6-2 (Sample 1)	Yes	1	1190	1165	5	0,01	0,12	0,2	0,55	0,13
GERO 6-2 (Sample 2)	Yes	1	1190	1165	5	0,01	0,09	0,18	0,59	0,12
GERO 6-3	Yes	1	1190	1165	10	0,02	0,14	0,31	0,44	0,1
GERO 6-4	Yes	1	1190	1165	24	0,06	0,27	0,23	0,34	0,1
GERO 6-5	Yes	1	1190	1120	2	0,09	0,25	0,25	0,36	0,05
GERO 6-6	Yes	1	1190	1120	5	0,13	0,29	0,3	0,27	0,01
GERO 6-7	Yes	1	1190	1120	10	0,18	0,44	0,26	0,12	0
GERO 6-8	Yes	1	1190	1120	24	0,19	0,31	0,25	0,24	0,01
GERO 6-9	Yes	1	1190	1120	240	0,13	0,29	0,32	0,23	0,02
GERO 6-10	Yes	9	1190	1165	5	0,01	0,08	0,13	0,51	0,27
GERO 6-11	Yes	9	1190	1165	24	0,01	0,15	0,21	0,54	0,09
GERO 6-12	Yes	9	1190	1120	10	0,14	0,21	0,22	0,23	0,21
GERO 6-13	Yes	9	1190	1120	24	0,15	0,25	0,27	0,28	0,04
	Yes	9	1190	1120	264	0,1	0,25	0,3	0,31	0,04
	Yes	9	1190	1120	384	0,08	0,21	0,29	0,38	0,04
	Yes	9	1190	1120	744	0,1	0,19	0,24	0,42	0,05
	Yes	9	1190	1120	744	0,1	0,22	0,26	0,4	0,02
GERO 6-14	No	1	1210	1120	24	0,71	0,24	0,06	0,06	0



			> 100 μm	< 10 μm
1100 °C	1	seed	0,04	0,23
		No seed	0,74	0
	25	seed	0,06	0,32
		No seed	0,66	0,11
	125	Seed	0,12	0,32
		No seed	0	0
	ΔT = 35-55 °C		0,78	0

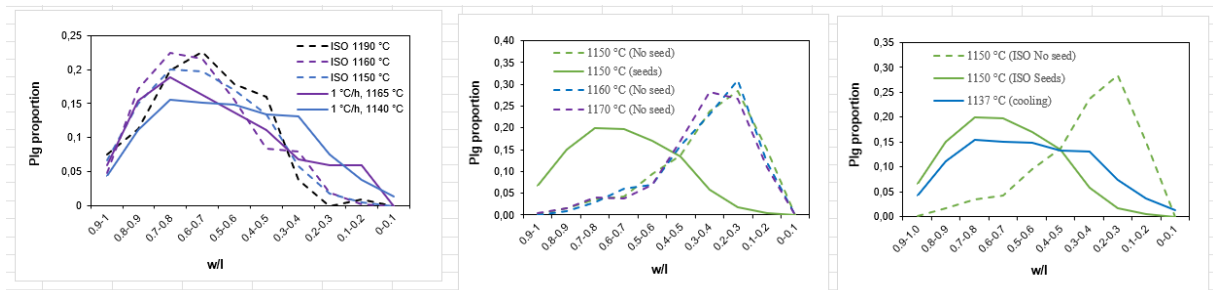
		> 100 µm	< 10 µm
1 °C/h, 1165 °C	0	0	0,39
	2	0	0,1
	5	0,01	0,13
	10	0,02	0,1
	24	0,06	0,1
1 °C/h, 1120 °C	0	0,02	0,3
	2	0,09	0,05
	5	0,13	0,01
	10	0,18	0
	24	0,19	0,01
9 °C/h, 1165 °C	0	0,02	0,32
	10	0,14	0,21
	264	0,15	0,04
	384	0,1	0,04
	744	0,08	0,04
9 °C/h, 1120 °C	0	0,02	0,3
	2	0,09	0,05
	5	0,13	0,01
	10	0,18	0
	24	0,19	0,01
Ti = 1210 °C, 1120 °C	0	0,82	
	24	0,71	

2D ASPECT RATIO

ISOTHERMAL

1150 C (24hours) with Seeds			1165 C (24hours) with Seeds			1180 C (24hours) with Seeds			1175 C (24hours) with Seeds			1160 C (24hours) with Seeds			1150 C (24hours) with Seeds		
Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l
8	0.075477	0.9-1	6	0.048337	0.9-1	36	0.11	0.9-1	47	0.09	0.9-1	22	0.05	0.9-1	38	0.07	0.9-1
12	0.113075	0.8-0.9	9	0.072581	0.8-0.9	109	0.12	0.8-0.9	85	0.12	0.8-0.9	78	0.17	0.8-0.9	86	0.15	0.8-0.9
21	0.159152	0.7-0.8	32	0.258065	0.7-0.8	755	0.18	0.7-0.8	54	0.15	0.7-0.8	102	0.22	0.7-0.8	114	0.20	0.7-0.8
24	0.228451	0.6-0.7	32	0.258065	0.6-0.7	201	0.23	0.6-0.7	129	0.23	0.6-0.7	98	0.22	0.6-0.7	113	0.20	0.6-0.7
19	0.1732453	0.5-0.6	24	0.193548	0.5-0.6	107	0.12	0.5-0.6	30	0.16	0.5-0.6	71	0.16	0.5-0.6	97	0.17	0.5-0.6
17	0.1603774	0.4-0.5	14	0.102003	0.4-0.5	140	0.16	0.4-0.5	66	0.12	0.4-0.5	36	0.08	0.4-0.5	77	0.13	0.4-0.5
4	0.0377258	0.3-0.4	5	0.040323	0.3-0.4	54	0.06	0.3-0.4	46	0.08	0.3-0.4	36	0.08	0.3-0.4	33	0.06	0.3-0.4
0	0.0-0.3		2	0.016129	0.2-0.3	14	0.02	0.2-0.3	19	0.03	0.2-0.3	9	0.02	0.2-0.3	10	0.02	0.2-0.3
1	0.009434	0.1-0.2	0	0.0-0.2		2	0.0-0.2		6	0.01	0.1-0.2	1	0.00	0.1-0.2	3	0.01	0.1-0.2
0	0.0-0.1		0	0.0-0.1		0	0.0-0.1		1	0.00	0.0-1	0	0.00	0.0-1	0	0.00	0.0-1
106			124			878			553			455			571		

1170 C (24hours) No seed			1180 C (24hours) No seed			1150 C (24hours) No seed		
Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l
3	0.0041551	0.9-1	4	0.0-0.1		1	0.00	0.9-1
12	0.0186205	0.8-0.9	23	0.011	0.8-0.9	11	0.02	0.8-0.9
29	0.0401862	0.7-0.8	41	0.03	0.7-0.8	24	0.04	0.7-0.8
28	0.0387812	0.6-0.7	30	0.06	0.6-0.7	29	0.04	0.6-0.7
50	0.0832521	0.5-0.6	118	0.07	0.5-0.6	64	0.10	0.5-0.6
123	0.1703601	0.4-0.5	258	0.18	0.4-0.5	32	0.14	0.4-0.5
204	0.2825485	0.3-0.4	364	0.23	0.3-0.4	160	0.24	0.3-0.4
193	0.267210	0.2-0.3	498	0.31	0.2-0.3	151	0.28	0.2-0.3
60	0.1100353	0.1-0.2	197	0.12	0.1-0.2	101	0.15	0.1-0.2
0	0.0-0.1		5	0.0-0.1		0	0.0-0.1	
722			1538			673		



COOLING

No seeds, 1 C/h (All temperatures)			Seeds, 1 C/h (All temperatures)		
Number	Prop	w/l	Number	Prop	w/l
3	0.02	0.9-1	228	0.04	0.9-1
6	0.03	0.8-0.9	545	0.11	0.8-0.9
7	0.04	0.7-0.8	751	0.15	0.7-0.8
7	0.04	0.6-0.7	805	0.16	0.6-0.7
9	0.05	0.5-0.6	744	0.15	0.5-0.6
10	0.06	0.4-0.5	642	0.13	0.4-0.5
13	0.08	0.3-0.4	563	0.11	0.3-0.4
32	0.18	0.2-0.3	437	0.09	0.2-0.3
62	0.30	0.1-0.2	274	0.05	0.1-0.2
34	0.20	0.0-1	85	0.02	0.0-1
173			5074		

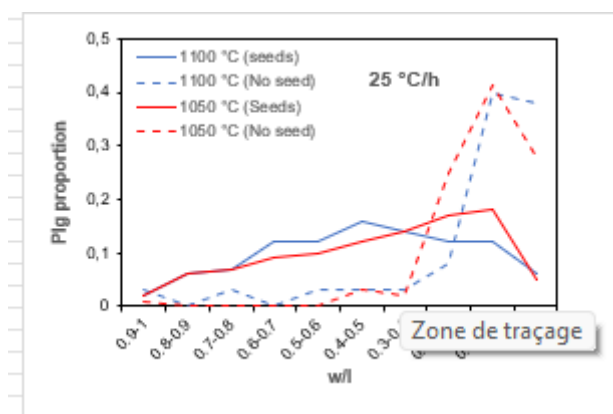
1 C/h, 1185 C (sample1 without corona)			1 C/h, 1185 C (sample1)			1 C/h, 1185 C (sample2)			1 C/h, 1157 C			1 C/h, 1120 C			1 C/h, 1100 C		
Number	prop	w/l	Number	prop	w/l	Number	prop	w/l	Number	prop	w/l	Number	prop	w/l	Number	prop	w/l
7	0.06	0.9-1	25	0.05	0.9-1	24	0.07	0.9-1	68	0.04	0.9-1.0	27	0.03	0.9-1.0	107	0.05	0.9-1
18	0.15	0.8-0.9	54	0.11	0.8-0.9	39	0.11	0.8-0.9	173	0.11	0.8-0.9	89	0.11	0.8-0.9	226	0.11	0.8-0.9
22	0.13	0.7-0.8	71	0.15	0.7-0.8	50	0.14	0.7-0.8	243	0.16	0.7-0.8	93	0.12	0.7-0.8	339	0.15	0.7-0.8
19	0.16	0.6-0.7	88	0.14	0.6-0.7	53	0.15	0.6-0.7	237	0.15	0.6-0.7	119	0.15	0.6-0.7	381	0.17	0.6-0.7
16	0.14	0.5-0.6	60	0.13	0.5-0.6	44	0.12	0.5-0.6	233	0.15	0.5-0.6	100	0.13	0.5-0.6	349	0.16	0.5-0.6
13	0.11	0.4-0.5	59	0.12	0.4-0.5	36	0.11	0.4-0.5	209	0.13	0.4-0.5	109	0.14	0.4-0.5	263	0.12	0.4-0.5
9	0.07	0.3-0.4	50	0.10	0.3-0.4	36	0.11	0.3-0.4	205	0.13	0.3-0.4	91	0.11	0.3-0.4	216	0.10	0.3-0.4
7	0.06	0.2-0.3	58	0.12	0.2-0.3	34	0.12	0.2-0.3	117	0.07	0.2-0.3	83	0.10	0.2-0.3	178	0.08	0.2-0.3
7	0.06	0.1-0.2	31	0.06	0.1-0.2	14	0.04	0.1-0.2	59	0.04	0.1-0.2	73	0.08	0.1-0.2	109	0.05	0.1-0.2
0	0.00	0.0-1	7	0.01	0.0-1	2	0.01	0.0-1	21	0.01	0.0-1	15	0.02	0.0-1	42	0.02	0.0-1
117			480			355			1585			799			2221		

3 C/h, 1185 C (sample 1)			3 C/h, 1140 C			3 C/h, 1120 C			3 C/h, 1100 C		
Number	prop	w/l	Number	prop	w/l	Number	prop	w/l	Number	prop	w/l
12	0.04	0.9-1	28	0.02	0.9-1	23	0.02	0.9-1	32	0.03	0.9-1.0
24	0.08	0.8-0.9	91	0.09	0.8-0.9	111	0.10	0.8-0.9	85	0.08	0.8-0.9
41	0.13	0.7-0.8	122	0.12	0.7-0.8	121	0.10	0.7-0.8	101	0.09	0.7-0.8
54	0.17	0.6-0.7	166	0.15	0.6-0.7	146	0.13	0.6-0.7	89	0.15	0.6-0.7
32	0.10	0.5-0.6	148	0.14	0.5-0.6	178	0.15	0.5-0.6	162	0.15	0.5-0.6
44	0.14	0.4-0.5	132	0.13	0.4-0.5	144	0.12	0.4-0.5	122	0.11	0.4-0.5
39	0.12	0.3-0.4	127	0.12	0.3-0.4	178	0.15	0.3-0.4	147	0.15	0.3-0.4
40	0.13	0.2-0.3	95	0.09	0.2-0.3	140	0.12	0.2-0.3	144	0.13	0.2-0.3
17	0.05	0.1-0.2	104	0.10	0.1-0.2	85	0.08	0.1-0.2	81	0.07	0.1-0.2
11	0.04	0.0-1	51	0.05	0.0-1	28	0.02	0.0-1	63	0.06	0.0-1
314			1054			1164			1036		

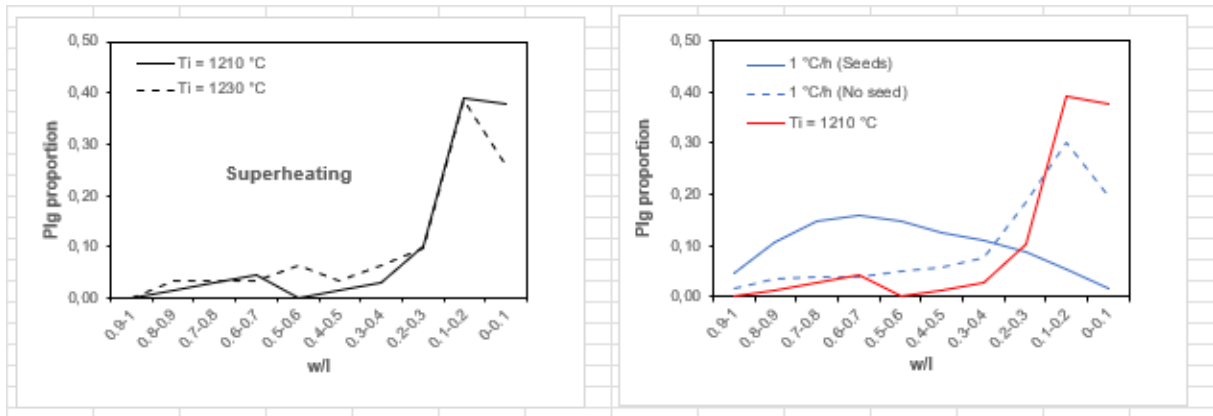


No seed, 1 CA, 1951 °C			No seed, 1 CA, 1640 °C			No seed, 1 CA, 1120 °C			No seed, 1 CA, 1000 °C			3 CA, 1050 °C (No seed)			3 CA, 1000 °C (No seed)		
Number	Prop	wt	Number	Proportion	Sto. range	Number	Proportion	Sto. range	number	proportion	range	number	prop.	wt	number	Prop	wt
2	0.06	0.3-1	3	0.04	0.3-1	4	0.05	0.3-1	1	0.01	0.3-1	3	0.022356	0.3-1	2	0.01	0.3-1
1	0.03	0.6-3	1	0.04	0.6-3	4	0.05	0.6-3	1	0.01	0.6-3	3	0.022356	0.6-3	1	0.00	0.6-3
1	0.08	0.7-9	1	0.04	0.7-9	4	0.05	0.7-9	1	0.01	0.7-9	0	0	0.7-9	0	0.01	0.7-9
3	0.06	0.6-7	4	0.06	0.6-7	4	0.05	0.6-7	0	0.03	0.6-7	3	0.022356	0.6-7	1	0.01	0.6-7
4	0.01	0.5-0.6	0	0.00	0.5-0.6	2	0.02	0.5-0.6	4	0.06	0.5-0.6	2	0.050504	0.5-0.6	9	0.04	0.5-0.6
3	0.06	0.4-0.5	1	0.11	0.4-0.5	1	0.11	0.4-0.5	1	0.11	0.4-0.5	1	0.054444	0.4-0.5	9	0.04	0.5-0.6
1	0.01	0.5-0.4	3	0.11	0.5-0.4	6	0.07	0.5-0.4	8	0.11	0.5-0.4	15	0.196719	0.3-0.4	28	0.13	0.3-0.4
1	0.04	0.2-0.3	0	0.01	0.2-0.3	0	0.01	0.2-0.3	0	0.01	0.2-0.3	41	0.10755	0.2-0.3	41	0.50	0.2-0.3
7	0.19	0.1-0.2	6	0.21	0.1-0.2	32	0.36	0.1-0.2	12	0.17	0.1-0.2	56	0.434109	0.1-0.2	95	0.44	0.1-0.2
3	0.25	0.0-1	3	0.1	0.0-1	12	0.14	0.0-1	13	0.19	0.0-1	23	0.182395	0.0-1	21	0.30	0.0-1
56			28			68			70			123			219		

25 °C/L 1165 °C (Seed)			25 °C/L 1100 °C (Seed)			25 °C/L 1050 °C (Seed)			25 °C/L 1100 °C (No seed)			25 °C/L 1050 °C (No seed)		
Number	prop	w/l	number	prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l
5	0,04	0,3-1	18	0,02	0,3-1	33	0,02	0,3-1	2	0,03	0,3-1	1	0,01	0,3-1
11	0,03	0,8-0,9	53	0,06	0,8-0,9	77	0,06	0,8-0,9	0	0	0,8-0,9	0	0,00	0,8-0,9
25	0,2	0,7-0,8	66	0,07	0,7-0,8	102	0,07	0,7-0,8	2	0,03	0,7-0,8	0	0,00	0,7-0,8
30	0,26	0,6-0,7	114	0,12	0,6-0,7	131	0,03	0,6-0,7	0	0	0,6-0,7	0	0,00	0,6-0,7
15	0,13	0,5-0,6	109	0,12	0,5-0,6	132	0,1	0,5-0,6	2	0,03	0,5-0,6	0	0,00	0,5-0,6
11	0,03	0,4-0,5	143	0,16	0,4-0,5	163	0,12	0,4-0,5	2	0,03	0,4-0,5	3	0,03	0,4-0,5
10	0,1	0,3-0,4	153	0,14	0,3-0,4	195	0,14	0,3-0,4	2	0,03	0,3-0,4	0	0,00	0,3-0,4
10	0,03	0,2-0,3	115	0,12	0,2-0,3	234	0,17	0,2-0,3	6	0,08	0,2-0,3	24	0,25	0,2-0,3
0	0	0,1-0,2	112	0,12	0,1-0,2	250	0,18	0,1-0,2	23	0,4	0,1-0,2	40	0,41	0,1-0,2
0	0	0-0,1	59	0,06	0-0,1	64	0,05	0-0,1	27	0,38	0-0,1	27	0,4	0,28
117			1987			3300			12			41		



25 °C/h, 1100 °C (Sample 1, Seeds)			1 °C/h, 1100 °C (Sample 2, Seeds)			125 °C/h, 1050 °C (Seeds)		
Number	prop	w/l	Number	prop	w/l	number	prop	w/l
41	0,04	0,3-1	18	0,02	0,3-1	124	0,03	0,3-1
65	0,06	0,8-0,9	69	0,06	0,8-0,9	155	0,04	0,8-0,9
86	0,08	0,7-0,8	110	0,09	0,7-0,8	261	0,07	0,7-0,8
125	0,12	0,6-0,7	118	0,10	0,6-0,7	326	0,08	0,6-0,7
135	0,13	0,5-0,6	158	0,13	0,5-0,6	475	0,12	0,5-0,6
119	0,11	0,4-0,5	150	0,13	0,4-0,5	433	0,13	0,4-0,5
128	0,12	0,3-0,4	174	0,15	0,3-0,4	603	0,16	0,3-0,4
176	0,17	0,2-0,3	150	0,13	0,2-0,3	640	0,17	0,2-0,3
128	0,12	0,1-0,2	144	0,12	0,1-0,2	575	0,15	0,1-0,2
50	0,05	0-0,1	82	0,07	0-0,1	189	0,05	0-0,1
1053			1173			3841		
Ti = 1210 °C; Tf = 1120 °C			Ti = 1210 °C; Tf = 1120 °C			Ti = 1210 °C; Tf = 1100 °C		
Number	prop	w/l	Number	Prop	w/l	Number	prop	w/l
0	0,00	0,3-1	0	0,00	0,3-1	0	0,00	0,3-1
0	0,00	0,8-0,9	0	0,00	0,8-0,9	1	0,05	0,8-0,9
0	0,00	0,7-0,8	0	0,00	0,7-0,8	2	0,09	0,7-0,8
1	0,08	0,6-0,7	1	0,03	0,6-0,7	1	0,05	0,6-0,7
0	0,00	0,5-0,6	0	0,00	0,5-0,6	0	0,00	0,5-0,6
1	0,08	0,4-0,5	0	0,00	0,4-0,5	0	0,00	0,4-0,5
0	0,00	0,3-0,4	1	0,03	0,3-0,4	1	0,05	0,3-0,4
1	0,08	0,2-0,3	5	0,15	0,2-0,3	1	0,05	0,2-0,3
2	0,15	0,1-0,2	16	0,47	0,1-0,2	9	0,41	0,1-0,2
8	0,62	0-0,1	11	0,32	0-0,1	7	0,32	0-0,1
13			34			22		
Ti = 1210 °C (All temperatures)			Ti = 1230 °C (All temperatures)			1230 °C, 1100 °C		
Number	Prop	w/l	Number	Prop	w/l	Number	prop	w/l
0	0,00	0,3-1	0	0	0,3-1	0	0	0,3-1
1	0,01	0,8-0,9	1	0,03	0,8-0,9	1	0,03	0,8-0,9
2	0,03	0,7-0,8	1	0,03	0,7-0,8	1	0,03	0,7-0,8
3	0,04	0,6-0,7	1	0,03	0,6-0,7	1	0,03	0,6-0,7
0	0,00	0,5-0,6	2	0,06	0,5-0,6	2	0,06	0,5-0,6
1	0,01	0,4-0,5	1	0,03	0,4-0,5	1	0,03	0,4-0,5
2	0,03	0,3-0,4	2	0,06	0,3-0,4	2	0,06	0,3-0,4
7	0,10	0,2-0,3	3	0,10	0,2-0,3	3	0,10	0,2-0,3
27	0,39	0,1-0,2	12	0,39	0,1-0,2	12	0,39	0,1-0,2
26	0,38	0-0,1	8	0,26	0-0,1	8	0,26	0-0,1
69			31			31		

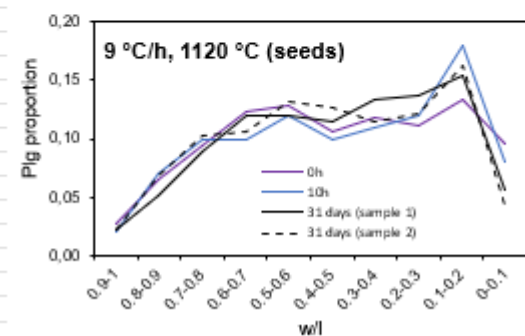
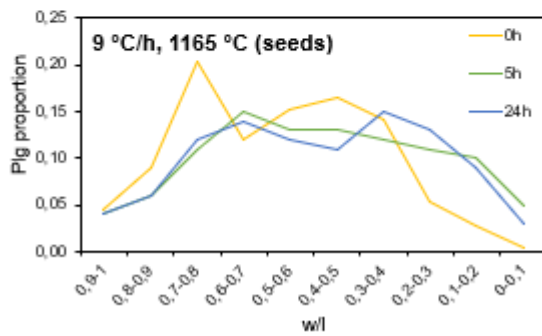
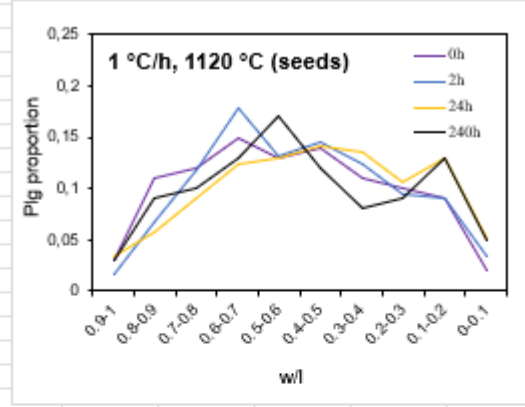
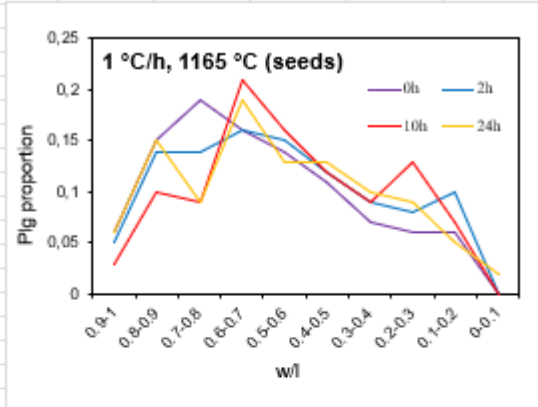


COOLING + ISO

1 °C/h, 1165 °C, 0h (Sample 1, Seed)			1165 °C, 2h (Seeds)			1165 °C, 5h (Sample 1, Seeds)			1165 °C, 5h (Sample 2, Seeds)			1165 °C, 10h (Seeds)			1165 °C, 24h (Seeds)		
nombre	prop	intervalle	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l
7	0,05	0,3-1	5	0,05	0,3-1	9	0,04	0,3-1	25	0,06	0,3-1	5	0,03	0,3-1	10	0,06	0,3-1
18	0,15	0,8-0,9	14	0,14	0,8-0,9	16	0,08	0,8-0,9	62	0,12	0,8-0,9	14	0,11	0,8-0,9	25	0,15	0,8-0,9
22	0,19	0,7-0,8	14	0,14	0,7-0,8	36	0,17	0,7-0,8	62	0,15	0,7-0,8	13	0,09	0,7-0,8	15	0,09	0,7-0,8
19	0,16	0,6-0,7	16	0,16	0,6-0,7	30	0,14	0,6-0,7	66	0,16	0,6-0,7	31	0,21	0,6-0,7	33	0,19	0,6-0,7
16	0,14	0,5-0,6	15	0,15	0,5-0,6	33	0,16	0,5-0,6	49	0,12	0,5-0,6	24	0,16	0,5-0,6	23	0,13	0,5-0,6
13	0,11	0,4-0,5	12	0,12	0,4-0,5	25	0,12	0,4-0,5	44	0,15	0,4-0,5	16	0,12	0,4-0,5	22	0,13	0,4-0,5
8	0,07	0,3-0,4	9	0,09	0,3-0,4	24	0,11	0,3-0,4	44	0,13	0,3-0,4	13	0,09	0,3-0,4	17	0,13	0,3-0,4
7	0,06	0,2-0,3	8	0,08	0,2-0,3	25	0,12	0,2-0,3	34	0,08	0,2-0,3	19	0,13	0,2-0,3	15	0,09	0,2-0,3
7	0,06	0,1-0,2	10	0,11	0,1-0,2	9	0,04	0,1-0,2	17	0,04	0,1-0,2	10	0,07	0,1-0,2	9	0,05	0,1-0,2
0	0	0-0,1	0	0	0-0,1	3	0,01	0-0,1	10	0,02	0-0,1	0	0	0-0,1	4	0,02	0-0,1
117			103			210			425			147			172		
1 °C/h, 1120 °C, 0h (Seeds)			1120 °C, 2h (Seeds)			1120 °C, 5h (Seeds)			1120 °C, 10h (Seeds)			1120 °C, 24h (Seeds)			1120 °C, 240h (Seeds)		
nombre	proportion	intervalle	Number	Prop	w/l	Number	Prop	w/l	Number	prop	w/l	Number	Prop	w/l	Number	Prop	w/l
27	0,03	0,3-1	6	0,02	0,3-1	3	0,03	0,3-1	3	0,02	0,3-1	11	0,03	0,3-1	11	0,03	0,3-1
89	0,11	0,8-0,9	24	0,07	0,8-0,9	19	0,06	0,8-0,9	8	0,06	0,8-0,9	13	0,06	0,8-0,9	32	0,09	0,8-0,9
53	0,12	0,7-0,8	42	0,12	0,7-0,8	42	0,13	0,7-0,8	14	0,10	0,7-0,8	30	0,09	0,7-0,8	37	0,11	0,7-0,8
119	0,15	0,6-0,7	64	0,16	0,6-0,7	59	0,16	0,6-0,7	28	0,20	0,6-0,7	41	0,12	0,6-0,7	47	0,13	0,6-0,7
100	0,13	0,5-0,6	47	0,13	0,5-0,6	48	0,15	0,5-0,6	16	0,11	0,5-0,6	43	0,13	0,5-0,6	62	0,17	0,5-0,6
109	0,14	0,4-0,5	52	0,15	0,4-0,5	41	0,13	0,4-0,5	22	0,16	0,4-0,5	47	0,14	0,4-0,5	42	0,12	0,4-0,5
91	0,11	0,3-0,4	44	0,12	0,3-0,4	30	0,09	0,3-0,4	12	0,09	0,3-0,4	45	0,14	0,3-0,4	28	0,08	0,3-0,4
53	0,11	0,2-0,3	34	0,10	0,2-0,3	39	0,12	0,2-0,3	14	0,10	0,2-0,3	35	0,10	0,2-0,3	31	0,09	0,2-0,3
73	0,09	0,1-0,2	32	0,09	0,1-0,2	27	0,08	0,1-0,2	15	0,11	0,1-0,2	43	0,13	0,1-0,2	46	0,13	0,1-0,2
15	0,02	0-0,1	12	0,03	0-0,1	9	0,03	0-0,1	9	0,06	0-0,1	17	0,05	0-0,1	19	0,05	0-0,1
799			397			323			141			331			955		

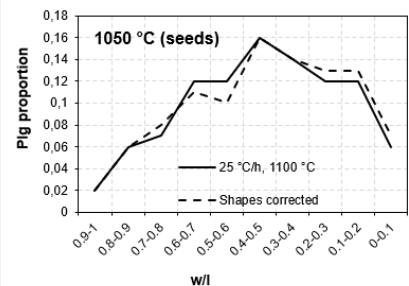
9 °C/h, 1120 °C (sample 1)			1120 °C, 1h (Seeds)			1120 °C, 24h (Seeds)			1120 °C, 11 days (Seeds)			1120 °C, 16 days (Seeds)			9 °C, 31 days (Seeds, Sample 1)			9 °C, 31 days (Seeds, Sample 2)		
Number	prop	w/l	Number	Prop	w/l	Number	prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l
46	0,02	0.9-1	13	0,02	0.9-1	9	0,02	0.9-1	16	0,02	0.9-1	34	0,02	0.9-1	26	0,02	0.9-1	34	0,02	0.9-1
102	0,06	0.8-0.9	48	0,07	0.8-0.9	27	0,05	0.8-0.9	49	0,06	0.8-0.9	83	0,07	0.8-0.9	80	0,05	0.8-0.9	74	0,07	0.8-0.9
164	0,09	0.7-0.8	70	0,1	0.7-0.8	54	0,09	0.7-0.8	71	0,09	0.7-0.8	124	0,09	0.7-0.8	127	0,09	0.7-0.8	103	0,09	0.7-0.8
226	0,12	0.6-0.7	72	0,1	0.6-0.7	58	0,1	0.6-0.7	91	0,1	0.6-0.7	146	0,12	0.6-0.7	167	0,12	0.6-0.7	167	0,12	0.6-0.7
235	0,12	0.5-0.6	90	0,12	0.5-0.6	67	0,1	0.5-0.6	98	0,11	0.5-0.6	161	0,1	0.5-0.6	167	0,12	0.5-0.6	164	0,12	0.5-0.6
185	0,15	0.4-0.5	75	0,15	0.4-0.5	68	0,12	0.4-0.5	100	0,12	0.4-0.5	163	0,12	0.4-0.5	177	0,12	0.4-0.5	159	0,12	0.4-0.5
205	0,12	0.3-0.4	78	0,11	0.3-0.4	75	0,12	0.3-0.4	108	0,12	0.3-0.4	164	0,12	0.3-0.4	207	0,12	0.3-0.4	125	0,12	0.3-0.4
184	0,15	0.2-0.3	98	0,15	0.2-0.3	85	0,14	0.2-0.3	130	0,15	0.2-0.3	165	0,13	0.2-0.3	181	0,14	0.2-0.3	123	0,12	0.2-0.3
232	0,12	0.1-0.2	113	0,18	0.1-0.2	97	0,16	0.1-0.2	129	0,16	0.1-0.2	181	0,16	0.1-0.2	228	0,16	0.1-0.2	179	0,16	0.1-0.2
167	0,18	0-0.1	62	0,18	0-0.1	90	0,18	0-0.1	135	0,18	0-0.1	170	0,18	0-0.1	187	0,18	0-0.1	147	0,18	0-0.1
1745			731			580			857			1247			1543			1094		

9 °C/h, 1165 °C (seeds)			1165 °C, 1h (Seeds)			1165 °C, 24h (seeds)		
Number	prop	w/l	Number	Prop	w/l	Number	Prop	w/l
10	0,04	0.9-1	19	0,04	0.9-1	24	0,04	0.9-1
20	0,09	0.8-0.9	32	0,08	0.8-0.9	33	0,08	0.8-0.9
46	0,20	0.7-0.8	62	0,19	0.7-0.8	64	0,12	0.7-0.8
27	0,12	0.6-0.7	80	0,16	0.6-0.7	75	0,14	0.6-0.7
34	0,15	0.5-0.6	70	0,12	0.5-0.6	65	0,12	0.5-0.6
37	0,16	0.4-0.5	70	0,12	0.4-0.5	61	0,11	0.4-0.5
32	0,14	0.3-0.4	65	0,12	0.3-0.4	79	0,15	0.3-0.4
12	0,05	0.2-0.3	59	0,11	0.2-0.3	70	0,12	0.2-0.3
6	0,03	0.1-0.2	56	0,1	0.1-0.2	51	0,09	0.1-0.2
1	0,00	0-0.1	28	0,05	0-0.1	17	0,02	0-0.1
229			541			539		

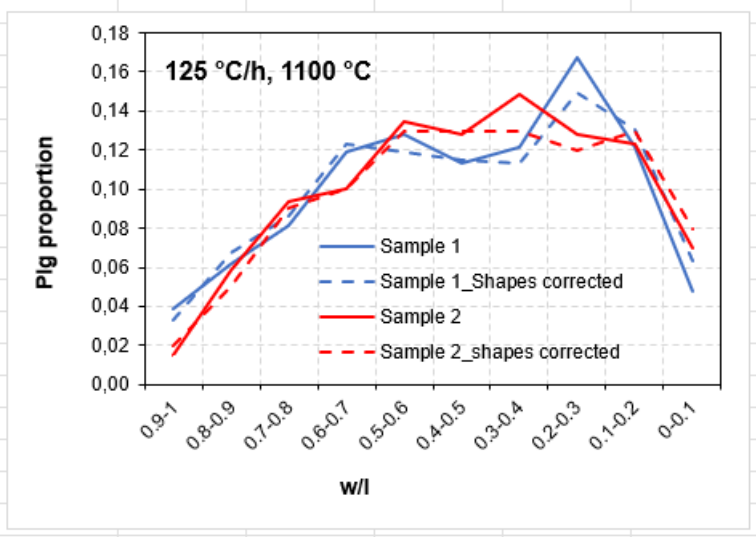


SHAPE CORRECTION

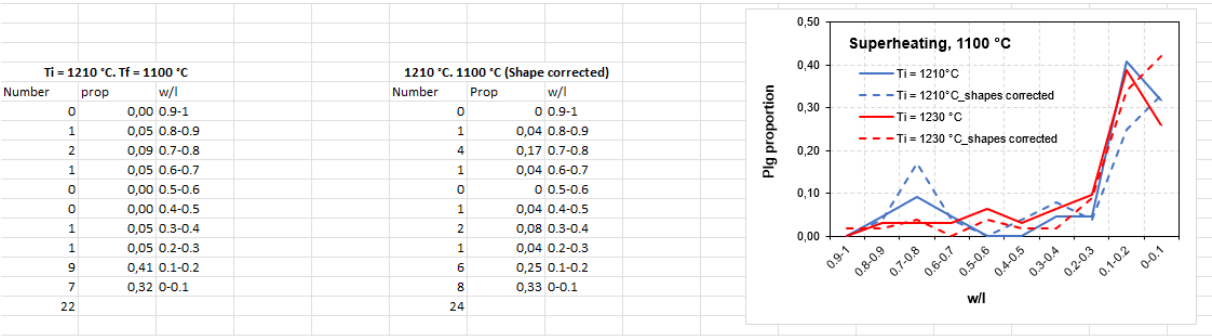
25 °C/h, 1100 °C (Seeds)			25 °C/h, 1100 °C (Seeds), Shape corrected		
number	prop	w/l	Number	Prop	w/l
18	0,02	0.9-1	22	0,02	0.9-1
53	0,06	0.8-0.9	50	0,06	0.8-0.9
68	0,07	0.7-0.8	70	0,08	0.7-0.8
114	0,12	0.6-0.7	103	0,11	0.6-0.7
109	0,12	0.5-0.6	94	0,1	0.5-0.6
149	0,16	0.4-0.5	144	0,16	0.4-0.5
133	0,14	0.3-0.4	126	0,14	0.3-0.4
115	0,12	0.2-0.3	113	0,13	0.2-0.3
112	0,12	0.1-0.2	114	0,13	0.1-0.2
59	0,06	0-0.1	62	0,07	0-0.1
930			898		



125 °C/h. 1100 °C (Sample 1. Seeds)			Sample 1 (Seeds). Shape corrected			125 °C/h. 1100 °C (Sample 2. Seeds)			Sample 2 (Seeds). Shape corrected		
Number	prop	w/l	Number	Prop	w/l	Number	prop	w/l	Number	Prop	w/l
41	0,04	0.9-1	17	0,03	0.9-1	18	0,02	0.9-1	8	0,02	0.9-1
65	0,06	0.8-0.9	35	0,07	0.8-0.9	69	0,06	0.8-0.9	18	0,05	0.8-0.9
86	0,08	0.7-0.8	45	0,09	0.7-0.8	110	0,09	0.7-0.8	31	0,09	0.7-0.8
125	0,12	0.6-0.7	64	0,12	0.6-0.7	118	0,10	0.6-0.7	35	0,1	0.6-0.7
135	0,13	0.5-0.6	62	0,12	0.5-0.6	158	0,13	0.5-0.6	46	0,13	0.5-0.6
119	0,11	0.4-0.5	60	0,12	0.4-0.5	150	0,13	0.4-0.5	46	0,13	0.4-0.5
128	0,12	0.3-0.4	59	0,11	0.3-0.4	174	0,15	0.3-0.4	45	0,13	0.3-0.4
176	0,17	0.2-0.3	78	0,15	0.2-0.3	150	0,13	0.2-0.3	41	0,12	0.2-0.3
128	0,12	0.1-0.2	68	0,13	0.1-0.2	144	0,12	0.1-0.2	44	0,13	0.1-0.2
50	0,05	0-0.1	33	0,06	0-0.1	82	0,07	0-0.1	28	0,08	0-0.1
1053			521			1173			342		



Ti = 1210 °C. Tf = 1130 °C			Ti = 1210 °C. Tf = 1130 °C (Shape corrected)			Ti = 1210 °C. Tf = 1120 °C			Ti = 1210 °C. Tf = 1120 °C (Shape corrected)		
Number	prop	w/l	Number	Prop	w/l	Number	Prop	w/l	Number	Prop	w/l
0	0,00	0.9-1	0	0	0.9-1	0	0,00	0.9-1	0	0	0.9-1
0	0,00	0.8-0.9	0	0	0.8-0.9	0	0,00	0.8-0.9	0	0	0.8-0.9
0	0,00	0.7-0.8	0	0	0.7-0.8	0	0,00	0.7-0.8	0	0	0.7-0.8
1	0,08	0.6-0.7	1	0,1	0.6-0.7	1	0,03	0.6-0.7	1	0,03	0.6-0.7
0	0,00	0.5-0.6	0	0	0.5-0.6	0	0,00	0.5-0.6	3	0,08	0.5-0.6
0	0,08	0.4-0.5	0	0	0.4-0.5	0	0,00	0.4-0.5	0	0	0.4-0.5
0	0,00	0.3-0.4	1	0,1	0.3-0.4	1	0,03	0.3-0.4	1	0,03	0.3-0.4
1	0,08	0.2-0.3	2	0,2	0.2-0.3	5	0,15	0.2-0.3	10	0,26	0.2-0.3
2	0,15	0.1-0.2	0	0	0.1-0.2	16	0,47	0.1-0.2	15	0,38	0.1-0.2
8	0,62	0-0.1	6	0,6	0-0.1	11	0,32	0-0.1	9	0,23	0-0.1
13			10			34			39		



Ti = 1230 °C. Tf = 1100 °C			Ti = 1230 °C. Tf = 1100 °C (Shape corrected)		
Number	prop	w/l	Number	Prop	w/l
0	0	0.9-1	1	0,02	0.9-1
1	0,03	0.8-0.9	1	0,02	0.8-0.9
1	0,03	0.7-0.8	2	0,04	0.7-0.8
1	0,03	0.6-0.7	0	0	0.6-0.7
2	0,06	0.5-0.6	2	0,04	0.5-0.6
1	0,03	0.4-0.5	1	0,02	0.4-0.5
2	0,06	0.3-0.4	1	0,02	0.3-0.4
3	0,10	0.2-0.3	5	0,09	0.2-0.3
12	0,39	0.1-0.2	18	0,34	0.1-0.2
8	0,26	0-0.1	22	0,42	0-0.1
31			53		

3D shape (ShapeCALC results)																
No textural correction										With textural correction						Relative Diff (%)
Pre-existing	Cooling rate	Ti (°C)	Tf (°C)	S	I	L	R2	S/I	I/L	S	I	L	R2	S/I	I/L	
No	1	1210	1120	1	8,4	8,4	0,984	0,12	1,00	1	7,6	16	0,983	0,13	0,48	52,50
No	1	1210	1100	1	5,4	8,8	0,964	0,19	0,61	1	8,4	9,6	0,787	0,12	0,88	42,59
No	1	1230	1100	1	8,2	13	0,99	0,12	0,63	1	12	13	0,987	0,08	0,92	46,34
Yes	25	1190	1100	1	2,2	6,4	0,961	0,45	0,34	1	2,2	6,4	0,952	0,45	0,34	0,00
Yes	125	1190	1100	1	2,2	6,4	0,926	0,45	0,34	1	2,2	6,4	0,925	0,45	0,34	0,00
Yes	125	1190	1100	1	2,2	6,4	0,947	0,45	0,34	1	2,2	6,4	0,938	0,45	0,34	0,00

FINAL DWELL TIME_LITTERATURE

Table S5

Textural parameters associated with the final dwell duration, including literature data from Cabane et al. (2005) and Pupier et al. (2008).

Sample	Mineral	Type of experiments	CR (°C/h)	Ln CR	T _{start} (°C)	T _i (°C)	T _f (°C)	-ΔTn (°C)	t _{final step} (h)	Φ _v	N _A (μm ⁻²)	I _{max} (μm)	I _{mean} (μm)
GERO 1-1 (sample 1) a	Plagioclase	Cooling	1	0	1175	1190	1165	10	0	0,06	2,55E-04	87	21,33
No crystal corona a	Plagioclase	Cooling	1	0	1175	1190	1165	10	0	0,01	9,03E-05	25	11,72
GERO 1-1 (sample 2) a	Plagioclase	Cooling	1	0	1175	1190	1165	10	0	0,03	1,62E-04	68	20,85
GERO 6-1	Plagioclase	Cooling + Iso	1	0	1175	1190	1165	10	2	0,01	2,52E-05	66	27,61
GERO 6-2 a1	Plagioclase	Cooling + Iso	1	0	1175	1190	1165	10	5	0,05	1,43E-04	83	27,26
GERO 6-2 a2	Plagioclase	Cooling + Iso	1	0	1175	1190	1165	10	5	0,04	1,33E-04	114	27,31
GERO 6-3	Plagioclase	Cooling + Iso	1	0	1175	1190	1165	10	10	0,03	6,00E-05	96	33,66
GERO 6-4	Plagioclase	Cooling + Iso	1	0	1175	1190	1165	10	24	0,04	4,31E-05	131	42,4
GERO 1-3	Plagioclase	Cooling	1	0	1175	1190	1120	55	0	0,21	4,99E-04	130	22,35
GERO 6-5	Plagioclase	Cooling + Iso	1	0	1175	1190	1120	55	2	0,15	1,66E-04	195	49,23
GERO 6-6	Plagioclase	Cooling + Iso	1	0	1175	1190	1120	55	5	0,18	1,26E-04	221	58,35
GERO 6-7	Plagioclase	Cooling + Iso	1	0	1175	1190	1120	55	10	0,19	9,45E-05	268	77,61
GERO 6-8	Plagioclase	Cooling + Iso	1	0	1175	1190	1120	55	24	0,18	1,36E-04	297	67,97
GERO 6-9	Plagioclase	Cooling + Iso	1	0	1175	1190	1120	55	240	0,18	1,43E-04	254	58,76
GERO 3-1	Plagioclase	Cooling	9	2,197	1175	1190	1165	10	0	0,01	1,63E-04	31	9,22
GERO 6-10	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1165	10	5	0,03	1,32E-04	103	21,96
GERO 6-11	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1165	10	24	0,04	1,16E-04	114	31,04
GERO 3-3a	Plagioclase	Cooling	9	2,197	1175	1190	1120	55	0	0,14	3,30E-04	187	28,23
GERO 3-3b	Plagioclase	Cooling	9	2,197	1175	1190	1120	55	0	0,15	4,01E-04	140	23,7
GERO 6-12	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1120	55	10	0,17	2,07E-04	271	49,07
GERO 6-13	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1120	55	24	0,2	2,09E-04	271	58,39
GERO 6-14	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1120	55	264	0,18	2,85E-04	238,61	50,58
GERO 6-15	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1120	55	384	0,19	3,18E-04	236,18	44,71
GERO 6-16a1	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1120	55	744	0,21	3,52E-04	257,51	46,21
GERO 6-16a2	Plagioclase	Cooling + Iso	9	2,197	1175	1190	1120	55	744				
Pupier et al. (2008)	Plagioclase	Cooling	1	0	1175	1191	1150	25	0	0,071	3,65E-05	40	4,11
Pupier et al. (2008)	Plagioclase	Cooling + Iso	1	0	1175	1191	1150	25	8,5	0,095	4,78E-05	36	2,41
Pupier et al. (2008)	Plagioclase	Cooling + Iso	1	0	1175	1191	1150	25	20,3	0,075	2,42E-05	44	2,68
Pupier et al. (2008)	Plagioclase	Cooling	1	0	1175	1191	1116	25	0	0,248	9,68E-05	96	8,09
Pupier et al. (2008)	Plagioclase	Cooling + Iso	1	0	1175	1191	1116	25	6,35	0,225	5,19E-05	64	6,62
Pupier et al. (2008)	Plagioclase	Cooling + Iso	1	0	1175	1191	1116	25	15,3	0,246	1,21E-04	56	6,23
Cabane et al. (2005)	Plagioclase	Iso	-	-		1250	1250		1	0,17	3,17E-02	-	2,20
Cabane et al. (2005)	Plagioclase	Iso	-	-		1250	1250		3,3	0,17	1,95E-02	-	2,90

Cabane et al. (2005)	Plagioclase	Iso	-	-	1250	1250		9,6	0,15	1,56E-02	-	3,40
Cabane et al. (2005)	Plagioclase	Iso	-	-	1250	1250		20	0,19	9,67E-03	-	3,70
Cabane et al. (2005)	Plagioclase	Iso	-	-	1250	1250		45,42	0,2	8,61E-03	-	3,80
Cabane et al. (2005)	Plagioclase	Iso	-	-	1250	1250		75	0,12	2,41E-03	-	4,30
Cabane et al. (2005)	Plagioclase	Iso	-	-	1250	1250		150	0,21	9,77E-03	-	4,40
Cabane et al. (2005)	Plagioclase	Iso	-	-	1250	1250		336	0,17	3,75E-03	-	5,20
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		0,33			-	
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		1,33	0,44	3,18E-02	-	4,20
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		6,08	0,48	1,88E-02	-	5,70
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		15,4	0,53	9,56E-03	-	8,40
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		43,2	0,53	3,87E-03	-	13,20
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		90,43	0,5	2,91E-03	-	14,80
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		161,8	0,47	1,69E-03	-	18,80
Cabane et al. (2005)	Olivine	Iso	-	-	1300	1300		496,38	0,53	1,04E-03	-	25,5

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NUCLEATION

Table S6
Diffusion coefficients of various elements (Si, Al, Ca, and Mg) as a function of temperature.

Temperature (°C)	log (η) (Pa.s)	1 sigma	D _{Si} (m ² .s; Mangler et al. 2023)	1 sigma	D _{Al} (m ² .s)	Max	Min	D _{Ca} (m ² .s)	Max	Min	D _{Mg} (m ² .s)	Max	Min
1200	2,71	-	2,83E-13	-	6,40E-13	1,71E-12	2,40E-13	1,73E-11	8,40E-13	3,56E-10	1,73E-14	9,97E-15	3,01E-14
1190	3,03	-	2,39E-13	-	5,38E-13	1,39E-12	2,07E-13	1,58E-11	7,60E-13	3,29E-10	1,51E-14	8,41E-15	2,72E-14
1180	3,02	-	1,37E-13	-	4,50E-13	1,14E-12	1,79E-13	1,45E-11	6,87E-13	3,04E-10	1,32E-14	7,07E-15	2,45E-14
1175	3,15	-	1,01E-13	-	4,12E-13	1,03E-12	1,66E-13	1,38E-11	6,53E-13	2,92E-10	1,23E-14	6,48E-15	2,33E-14
1160	3,33	-	6,61E-14	-	3,14E-13	7,49E-13	1,32E-13	1,20E-11	5,59E-13	2,59E-10	9,93E-15	4,97E-15	1,99E-14
1150	3,27	-	7,53E-14	-	2,61E-13	6,05E-13	1,13E-13	1,10E-11	5,03E-13	2,38E-10	8,60E-15	4,15E-15	1,78E-14
1120	3,69	0,08	2,84E-14	5,38E-15	1,48E-13	3,13E-13	6,96E-14	8,20E-12	3,63E-13	1,85E-10	5,52E-15	2,38E-15	1,28E-14
1100	3,85	0,12	1,96E-14	5,76E-15	9,96E-14	1,99E-13	4,99E-14	6,71E-12	2,90E-13	1,55E-10	4,06E-15	1,62E-15	1,02E-14
1050	4,59	0,51	8,56E-15	4,58E-15	3,53E-14	6,00E-14	2,08E-14	3,96E-12	1,61E-13	9,77E-11	1,81E-15	5,87E-16	5,58E-15
1000	7,01	0,35	1,44E-17	1,04E-17	1,16E-14	1,65E-14	8,09E-15	2,25E-12	8,49E-14	5,94E-11	7,58E-16	1,97E-16	2,92E-15

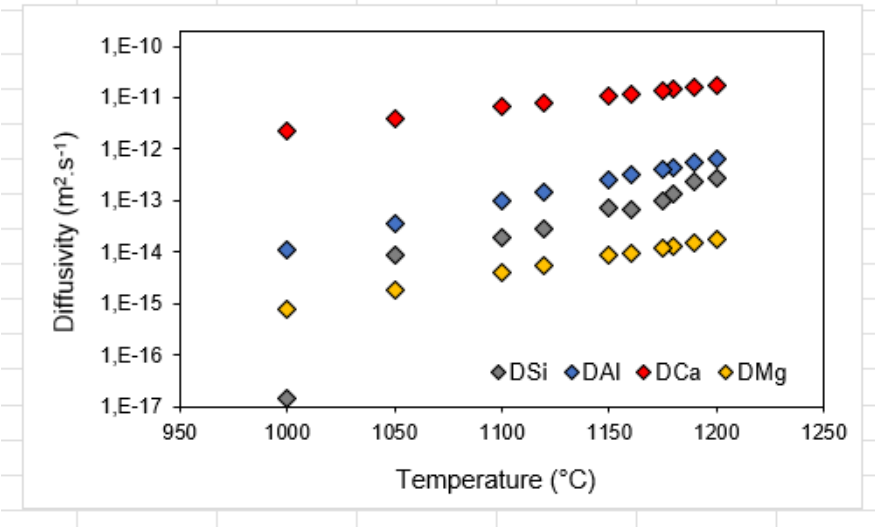
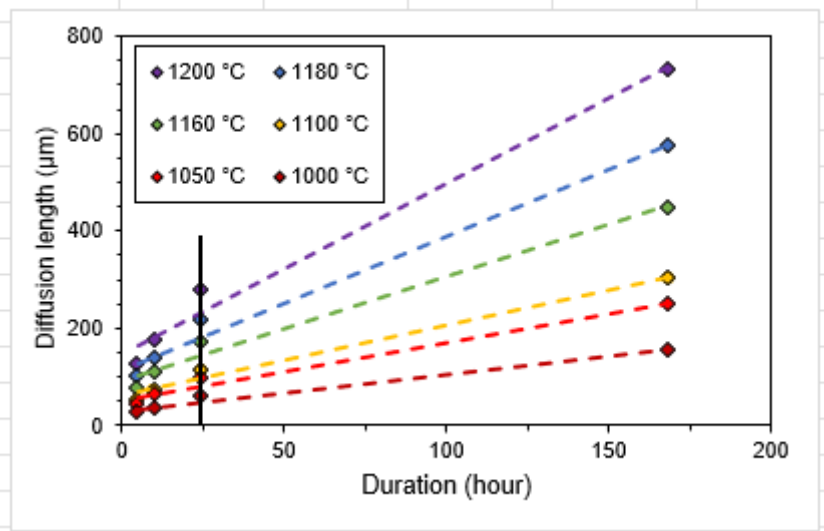


Table S7

Diffusion length as a function of temperature. The diffusion coefficients used are reported in the table S6.

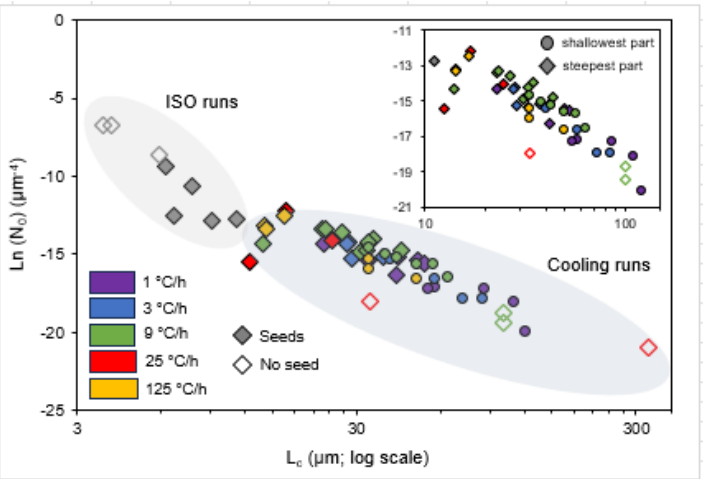
Temperature (°C)	Duration (hour)	Diffusion length (μm)				Average (Si, Al)	1 sigma
		D _{Si} (m ² .s) Mangler et al. 2023)	D _{Al} (m ² .s)	D _{Ca} (m ² .s)	D _{Mg} (m ² .s)		
1200	5	100,96	151,83	788,82	24,97	126	36
1200	10	142,78	214,72	1115,57	35,31	179	51
1200	24	221,19	332,64	1728,23	54,70	277	79
1200	168	585,22	880,08	4572,46	144,72	733	208
1190	5	92,83	139,13	754,57	23,32	116	33
1190	10	131,28	196,76	1067,12	32,99	164	46
1190	24	203,37	304,82	1653,18	51,10	254	72
1190	168	538,07	806,48	4373,90	135,20	672	190
1180	5	70,17	127,34	721,36	21,77	99	40
1180	10	99,24	180,09	1020,16	30,79	140	57
1180	24	153,75	278,99	1580,43	47,69	216	89
1180	168	406,77	738,14	4181,42	126,19	572	234
1160	5	48,77	106,28	658,03	18,91	78	41
1160	10	68,97	150,31	930,59	26,74	110	58
1160	24	106,85	232,85	1441,67	41,43	170	89
1160	168	282,71	616,07	3814,29	109,60	449	236
1150	5	52,08	96,91	627,87	17,60	74	32
1150	10	73,65	137,05	887,94	24,88	105	45
1150	24	114,10	212,32	1375,59	38,55	163	69
1150	168	301,87	561,75	3639,47	102,00	432	184
1120	5	31,95	72,89	543,23	14,09	52	29
1120	10	45,19	103,08	768,25	19,93	74	41
1120	24	70,00	159,70	1190,17	30,88	115	63
1120	168	185,22	422,52	3148,88	81,69	304	168
1100	5	31,95	72,89	543,23	14,09	52	29
1100	10	45,19	103,08	768,25	19,93	74	41
1100	24	70,00	159,70	1190,17	30,88	115	63
1100	168	185,22	422,52	3148,88	4901,53	304	168
1050	5	26,58	59,87	491,52	12,09	43	24
1050	10	37,58	84,67	695,11	17,10	61	33
1050	24	58,23	131,17	1076,86	26,49	95	52
1050	168	154,05	347,03	2849,11	70,08	251	136
1000	5	17,55	35,66	377,72	8,07	27	13
1000	10	24,82	50,44	534,18	11,42	38	18
1000	24	38,45	78,13	827,55	17,69	58	28
1000	168	101,73	206,72	2189,50	46,80	154	74



Supplementary Information File 4

CSD PARAMETERS

	Name	Pre-treatment	Cooling rate (°C/h)	T _i (°C)	T _f (°C)	Final dwell time (h)	Steepest part (based on I axis)			Shallowest part (based on I axis)		
							Slope (3D)	L _c (μm)	Ln (N _d) (μm ⁻⁴)	Slope (3D)	L _c (μm)	Ln (N _d) (μm ⁻⁴)
	G 0-1	No	-	1185	1185	24	-0,15	7	-12,58	-	-	-
	G 0-2	No	-	1180	1180	24	-0,11	9	-12,84	-	-	-
	G 0-3	No	-	1175	1175	24	-0,09	11	-12,78	-	-	-
	G 0-4	No	-	1160	1160	24	-0,13	8	-10,69	-	-	-
	G 0-5	No	-	1150	1150	24	-0,16	6	-9,41	-	-	-
	G 0-9	1450 °C, 2h	-	1170	1170	24	-0,17	6	-8,62	-	-	-
	G 0-10	1450 °C, 2h	-	1160	1160	24	-0,27	4	-6,72	-	-	-
	G 0-11	1450 °C, 2h	-	1150	1150	24	-0,25	4	-6,76	-	-	-
Billon et al. 2025	G 1-1 a1	No	1	1190	1165	0,1	-0,030	33	-15,38	-0,017	58	-17,21
Billon et al. 2025	No Plg corona	No	1	1190	1165	0,1	-0,044	23	-14,36	-	-	-
Billon et al. 2025	G 1-1 a2	No	1	1190	1165	0,1	-0,024	42	-16,30	-0,018	55	-17,27
Billon et al. 2025	G 1-2	No	1	1190	1137	0,1	-0,024	42	-15,19	-0,008	121	-20,08
Billon et al. 2025	G 1-3	No	1	1190	1120	0,1	-0,020	49	-15,43	-0,009	110	-18,14
Billon et al. 2025	G 1-4	No	1	1190	1100	0,1	-0,019	53	-15,58	-0,012	87	-17,33
Billon et al. 2025	G 2-1a	No	3	1190	1165	0,1	-0,035	29	-15,24	-0,014	73	-17,91
Billon et al. 2025	G 2-2	No	3	1190	1140	0,1	-0,027	37	-15,15	-0,012	85	-17,95
Billon et al. 2025	G 2-3	No	3	1190	1120	0,1	-0,036	28	-14,27	-0,025	40	-15,41
Billon et al. 2025	G 2-4	No	3	1190	1100	0,1	-0,036	28	-14,38	-0,017	58	-16,65
Billon et al. 2025	G 3-1	No	9	1190	1165	0,1	-0,072	14	-14,38	-	-	-
Billon et al. 2025	G 3-2 a1 (Seg 1)	No	9	1190	1140	0,1	-0,044	23	-13,38	-0,030	34	-14,70
Billon et al. 2025	G 3-2 a1 (Seg 2)	No	9	1190	1140	0,1	-0,043	23	-13,34	-0,024	42	-15,27
Billon et al. 2025	G 3-2b	No	9	1190	1140	0,1	-0,038	27	-13,59	-0,026	38	-15,09
Billon et al. 2025	G 3-3a	No	9	1190	1120	0,1	-0,032	31	-14,90	-0,020	50	-15,66
Billon et al. 2025	G 3-3b	No	9	1190	1120	0,1	-0,031	33	-14,73	-0,016	64	-16,60
Billon et al. 2025	G 3-4	No	9	1190	1100	0,1	-0,029	35	-13,99	-0,018	57	-15,71
Billon et al. 2025	G 3-5	No	9	1190	1050	0,1	-0,030	33	-14,24	-0,021	48	-
Billon et al. 2025	G 3-6	No	9	1190	1000	0,1	-0,023	43	-14,78	-	-	-
	G 4-1	No	25	1190	1165	0,1	-0,080	13	-15,46	-	-	-
	G 4-2	No	25	1190	1100	0,1	-0,059	17	-12,21	-	-	-
	G 4-3	No	25	1190	1050	0,1	-0,041	25	-14,07	-0,02	50	-16,00
	G 5-1	No	125	1190	1165	0,1	-	-	-	-	-	-
	G 5-2 a1	No	125	1190	1100	0,1	-0,071	14	-13,21	-0,03	33	-15,99
	G 5-2 a2	No	125	1190	1100	0,1	-0,070	14	-13,34	-0,02	50	-16,68
	G 5-3	No	125	1190	1050	0,1	-0,060	17	-12,49	-0,03	33	-15,43
	G 8-1	1450 °C, 2h	9	1190	1050	0,1	-0,010	100	-19,44	-	-	-
	G 8-2	1450 °C, 2h	9	1190	1000	0,1	-0,010	100	-18,72	-	-	-
	G 9-2	1450 °C, 2h	25	1190	1100	0,1	-0,030	33	-17,98	-0,008	125	-20,08
	G 9-3	1450 °C, 2h	25	1190	1050	0,1	-0,003	333	-20,95	-	-	-
	G 6-1	No	1	1190	1165	2	-0,020	50	-18,86	-	-	-
	G 6-2a1	No	1	1190	1165	5	-0,020	50	-17,42	-	-	-
	G 6-2a2	No	1	1190	1165	5	-0,020	50	-16,93	-0,005	200	-22,7
	G 6-3	No	1	1190	1165	10	-0,020	50	-18,12	-	-	-
	G 6-4	No	1	1190	1165	24	-0,060	17	-16,70	-0,01	100	-18,9
	G 6-5	No	1	1190	1120	2	-0,01	100	-17,94	-	-	-
	G 6-6	No	1	1190	1120	5	-0,009	111	-18,56	-0,005	200	-20,35
	G 6-7	No	1	1190	1120	10	-0,010	100	-18,82	-0,006	167	-20,72
	G 6-8	No	1	1190	1120	24	-0,010	100	-17,86	-	-	-
	G 6-9	No	1	1190	1120	240	-0,008	125	-18,64	-	-	-
	G 6-10	No	9	1190	1165	5	-0,030	33	-16,15	-	-	-
	G 6-11	No	9	1190	1165	24	-0,020	50	-16,80	-	-	-
	G 6-12	No	9	1190	1120	10	-0,220	5	-13,00	-0,02	50	-16,43
	G 6-13	No	9	1190	1120	24	-0,020	50	-16,62	-	-	-
	G 6-14	No	9	1190	1120	264	-0,020	50	-16,18	-	-	-
	G 6-15	No	9	1190	1120	384	-0,030	33	-16,31	-	-	-
	G 6-16a	No	9	1190	1120	744	-0,030	33	-15,28	-0,014	71	-17,48
	G 6-16b	No	9	1190	1120	744	-0,016	62,5	-17,48	-0,008	125	-18,31



DATA

Red values: Not enough crystals in the size range considered

Sample	Type	Seed-bearing	Cooling rate (°C/h)	T _i (°C)	T _f (°C)	t _{cooling} (hours)	t _{anneal} (hours)	CSD plot			
								Using l axis		Using w axis	
								Mid Inter (μm)	ln(pop den) (μm ⁻⁴)	Mid Inter (μm)	ln(pop den) (μm ⁻⁴)
G 0-5	ISO	Yes	-	1150	1150	-	24	46,5	-16,75	42	-16,49
								29,4	-14,18	26,5	-14,21
								18,5	-12,54	16,74	-11,87
								11,69	-11,08	10,56	-10,3
								7,37	-10,59	6,66	-9,98
								4,65	-12,24	-	-
G 0-4	ISO	Yes	-	1160	1160	-	24	72	-19,7	37,2	-16,72
								45,4	-16,85	23,5	-14,34
								28,6	-14,83	14,83	-12,23
								18,1	-13,06	9,35	-11,03
								11,4	-11,83	5,9	-10,79
								7,2	-11,49	-	-
G 0-3	ISO	Yes	-	1175	1175	-	24	4,54	-11,91	-	-
								84	-20,38	76,4	-19,93
								53	-17,95	48,2	-18
								33,5	-16,11	30,4	-15,79
								21,1	-14,67	19,18	-13,98
								13,32	-13,81	12,1	-13,08
G 0-2	ISO	Yes	-	1180	1180	-	24	8,4	-14,51	7,64	-13,67
								5,3	-14,39	-	-
								109,8	-23,08	60,4	-19,91
								69,3	-20,38	38,1	-17,53
								43,7	-17,93	24	-15,34
								27,6	-16,02	15,16	-13,94
G 0-1	ISO	Yes	-	1185	1185	-	24	17,4	-14,81	9,57	-13,16
								10,98	-14,1	6,04	-16,42
								6,93	-13,7	3,81	-12,03
								4,37	-13,03	-	-
								39	-18,54	33,6	-17,71
								24,6	-16,47	21,2	-15,68
G 0-9	ISO	No	-	1170	1170	-	24	15,5	-14,76	13,39	-14,18
								9,79	-13,94	8,45	-13,59
								6,17	-13,72	5,33	-12,66
								3,9	-14,32	-	-
								56,8	-18,54	30,86	-14,89
								35,8	-14,65	19,47	-12,33
G 0-10	ISO	No	-	1160	1160	-	24	22,59	-12,42	12,29	-9,9
								14,26	-10,86	7,75	-8,72
								8,99	-10,49	4,891	-10,07
								5,68	-10,83	-	-
								3,58	-13,27	-	-
								2,259	-12,18	-	-
G 0-11	ISO	No	-	1150	1150	-	24	38	-17,01	32,86	-16,23
								24	-13,07	20,73	-12,74
								15,12	-10,64	13,08	-10,61
								9,54	-9,45	8,25	-8,44
								6,02	-9,38	5,21	-7,41
								3,8	-10,09	3,286	-9,79
G 0-11	ISO	No	-	1150	1150	-	24	37,8	-16,11	20,32	-12,42
								23,9	-12,73	12,82	-10,43
								15,06	-10,25	8,09	-8,06
								9,5	-8,99	5,1	-6,6
								6	-8,46	3,22	-9,08
								3,78	-9,45	2,032	-10,27
G 0-11	ISO	No	-	1150	1150	-	24	2,39	-9,65	-	-
								-	-	-	-

Sample	Type	Seed-bearing	Cooling rate (°C/h)	T _i (°C)	T _f (°C)	t _{cooling} (hours)	t _{anneal} (hours)	CSD plot (log10 size scale)			
								Using l axis		Using w axis	
								Mid Inter (μm)	ln(pop den) (μm ⁻⁴)	Mid Inter (μm)	ln(pop den) (μm ⁻⁴)
G 1-1a1	Cooling	Yes	1	1190	1165	25	0	476	-25,42	-	-
								300,4	-22,56	-	-
								189,5	-20,52	-	-
								119,6	-19,04	-	-
								75,5	-17,82	-	-
								47,6	-16,52	-	-
								30,04	-16,62	-	-
								18,95	-17,38	-	-
								11,96	-17,05	-	-
								7,55	-16,12	-	-
G 1-1a1 (without crystal corona)	Cooling	Yes	1	1190	1165	25	0	162,7	-21,41	-	-
								102,7	-19,05	-	-
								64,8	-17,08	-	-
								40,88	-17,08	-	-
								25,79	-16,4	-	-
								16,27	-16,89	-	-
								10,27	-16,73	-	-
								340,8	-23,8	-	-
G 1-1a2	Cooling	Yes	1	1190	1165	25	0	215	-21,18	-	-
								135,7	-19,69	-	-
								85,6	-18,4	-	-
								54	-17,37	-	-
								34,08	-16,94	-	-
G 1-2	Cooling	Yes	1	1190	1137	53	0	494	-24,8	-	-
								311,6	-22,59	-	-
								196,6	-19,8	-	-
								124	-18,39	-	-
								78,3	-17,07	-	-
								49,4	-16,17	-	-
								31,16	-15,55	-	-
								19,66	-15,73	-	-
G 1-3	Cooling	Yes	1	1190	1120	70	0	12,4	-15,66	-	-
								7,83	-16,59	-	-
								911	-26,19	-	-
								575	-23,6	-	-
								362,8	-21,44	-	-
								228,9	-20,05	-	-
								144,4	-18,7	-	-
								91,1	-17,13	-	-
								57,5	-16,39	-	-
								36,28	-15,93	-	-
G 1-4	Cooling	Yes	1	1190	1100	90	0	22,89	-15,87	-	-
								14,44	-15,94	-	-
								9,11	-16,04	-	-
								5,75	-16,2	-	-
								1349	-28,15	-	-
								851	-26,55	-	-
								537	-23,71	-	-
								338,9	-21,31	-	-
								213,8	-19,84	-	-
								134,9	-18,36	-	-
								85,1	-17,02	-	-
								53,7	-16,43	-	-
								33,89	-15,91	-	-
								21,38	-16,11	-	-
								13,49	-15,75	-	-
								8,51	-15,19	-	-

G 2-1a	Cooling	Yes	3	1190	1165	8,33	0	342,9	-23,96	-	-
								216,3	-20,84	-	-
								136,5	-19,95	-	-
								86,1	-18,45	-	-
								54,3	-17,03	-	-
								34,29	-16,36	-	-
								21,63	-15,99	-	-
								13,65	-15,45	-	-
								8,61	-16,17	-	-
								5,43	-17,22	-	-
G 2-2	Cooling	Yes	3	1190	1140	16,67	0	438	-23,47	-	-
								276,3	-21,51	-	-
								174,3	-19,55	-	-
								110	-18,36	-	-
								69,4	-17	-	-
								43,8	-16,2	-	-
								27,63	-15,82	-	-
								17,43	-15,44	-	-
								11	-15,25	-	-
								6,94	-14,94	-	-
G 2-3	Cooling	Yes	3	1190	1120	23,33	0	319	-23,64	-	-
								201,2	-20,26	-	-
								126,9	-18,71	-	-
								80,1	-17,39	-	-
								50,5	-16,09	-	-
								31,9	-15,4	-	-
								20,12	-14,9	-	-
								12,69	-14,35	-	-
								8,01	-14,09	-	-
								5,05	-14,91	-	-
G 2-4	Cooling	Yes	3	1190	1100	30,00	0	319	-13,96	-	-
								314	-22,09	-	-
								198	-20,05	-	-
								124,9	-18,68	-	-
								78,8	-17,39	-	-
								49,7	-16,06	-	-
								31,4	-15,65	-	-
								19,8	-15,2	-	-
								12,49	-14,68	-	-
								7,88	-14,34	-	-
								4,97	-13,32	-	-
								3,14	-13,96	-	-

G 3-1	Cooling	Yes	9	1190	1165	2,78	0	137,5	-23,51	-	-
								86,7	-20,65	-	-
								54,7	-18,25	-	-
								34,5	-17,29	-	-
								21,79	-15,92	-	-
								13,75	-15,05	-	-
								8,67	-14,61	-	-
G 3-2a1 (Seg1)	Cooling	Yes	9	1190	1140	5,56	0	497	-25,2	-	-
								314	-23,61	-	-
								198,1	-20,56	-	-
								125	-18,38	-	-
								78,8	-17,21	-	-
								49,7	-15,6	-	-
								31,4	-14,6	-	-
								19,81	-14,22	-	-
								12,5	-13,89	-	-
								7,88	-13,07	-	-
G 3-2a1 (Seg2)	Cooling	Yes	9	1190	1140	5,56	0	4,97	-12,36	-	-
								3,14	-13,27	-	-
								312	-23,15	-	-
								196,7	-20,48	-	-
								124,1	-18,28	-	-
								78,3	-16,94	-	-
								49,4	-15,65	-	-
								31,2	-14,57	-	-
								19,67	-14,21	-	-
								12,41	-13,76	-	-
G 3-2a2	Cooling	Yes	9	1190	1140	5,56	0	7,83	-12,89	-	-
								4,94	-11,93	-	-
								3,12	-12,99	-	-
								414	-24,42	-	-
								261,3	-22,46	-	-
								164,9	-19,51	-	-
								104	-17,58	-	-
								65,6	-16,28	-	-
								41,4	-14,99	-	-
								26,13	-14,34	-	-
G 3-3a	Cooling	Yes	9	1190	1120	7,78	0	16,49	-14	-	-
								10,4	-13,56	-	-
								6,56	-12,82	-	-
								4,14	-12,98	-	-
								398	-24,49	-	-
								251	-21,97	-	-
								158,5	-19,79	-	-
								100	-18,24	-	-
								63,1	-16,99	-	-
								39,8	-16,16	-	-
								25,1	-15,87	-	-
								15,85	-15,41	-	-
								10	-14,48	-	-
								6,31	-13,52	-	-
								3,98	-12,84	-	-
								2,51	-13,41	-	-

G 3-3b	Cooling	Yes	9	1190	1120	7,78	0	457	-24,75	-	-
								288	-21,97	-	-
								182	-20,16	-	-
								114,9	-18,38	-	-
								72,5	-17,1	-	-
								45,7	-16,07	-	-
								28,8	-15,78	-	-
								18,2	-15,15	-	-
								11,49	-14,56	-	-
								7,25	-13,19	-	-
								4,57	-12,26	-	-
G 3-4	Cooling	Yes	9	1190	1100	10,00	0	2,88	-12,7	-	-
								459	-23,52	-	-
								289,8	-20,93	-	-
								182,8	-18,89	-	-
								115,4	-17,5	-	-
								72,8	-16,1	-	-
								45,9	-15,22	-	-
								28,98	-14,84	-	-
								18,28	-14,68	-	-
								11,54	-13,52	-	-
								7,28	-12,63	-	-
G 3-5	Cooling	Yes	9	1190	1050	15,56	0	4,59	-13,5	-	-
								218	-20,75	-	-
								137,5	-18,46	-	-
								86,7	-17,07	-	-
								54,7	-15,88	-	-
								34,5	-14,94	-	-
								21,8	-14,97	-	-
								13,75	-15,55	-	-
								8,67	-14,47	-	-
G 3-6	Cooling	Yes	9	1190	1000	21,11	0	334	-22,58	-	-
								210,6	-19,57	-	-
								132,9	-18,01	-	-
								83,9	-16,67	-	-
								52,9	-15,91	-	-
								33,4	-16,37	-	-
G 4-1 (using global image)	Cooling	Yes	25	1190	1165	1	0	59	-19,9	53,5	-20,09
								37,2	-18,65	33,8	-17,74
								23,5	-16,67	21,31	-16,51
								14,82	-16,07	13,45	-15,23
								9,35	-16,84	8,48	-15,43
G 4-1 (using various sections)	Cooling	Yes	25	1190	1165	1	0	83,1	-21,14	73,7	-21,01
								52,4	-19,29	46,5	-18,64
								33,1	-18,08	29,34	-17,58
								20,87	-17,03	18,51	-16,17
								13,17	-15,71	11,68	-15,57
								8,31	-15,63	7,37	-14,63
								5,24	-15,11	4,65	-14,21

G 4-2 (with textural correction)	Cooling	Yes	25	1190	1100	3,6	0	344	-23,58	125	-19,47
								217	-21,14	79,8	-16,25
								137	-18,95	49,7	-14,35
								86,4	-17,31	31,39	-13,73
								54,5	-15,77	19,8	-12,96
								34,4	-14,4	12,5	-12,28
								21,7	-13,67	7,88	-11,12
								13,7	-13,4	4,97	-10,56
								8,64	-12,64	3,139	-11,97
								5,45	-11,97	1,98	-12,39
								3,44	-12,17	-	-
								2,17	-13,27	-	-
								230	-20,97	124,2	-19,62
G 4-2 (no textural correction)	Cooling	Yes	25	1190	1100	3,6	0	145,4	-19,18	79,3	-16,2
								91,7	-17,31	49,4	-14,34
								57,9	-15,8	31,19	-13,61
								36,5	-14,33	19,88	-12,87
								23	-13,71	12,42	-12,18
								14,54	-13,38	7,83	-11,07
								9,17	-12,72	4,94	-10,74
								5,79	-12,03	3,119	-12,63
								3,85	-12,28	1,968	-12,7
								401	-25,17	154,2	-20,59
								253	-21,91	97,3	-17,53
								160	-19,61	61,4	-15,76
								100,8	-18,09	38,7	-14,64
G 4-3	Cooling	Yes	25	1190	1050	5,6	0	63,6	-16,81	24,44	-14
								40,1	-15,74	15,42	-13,53
								25,3	-14,97	9,73	-12,74
								16	-14,75	6,14	-12,58
								10,08	-14,48	-	-
								6,36	-13,7	-	-
								4,01	-13,16	-	-
								249	-24,34	131	-21,97
								157	-21,08	82,7	-18,8
								99,1	-19,38	52,2	-16,47
								62,5	-17,74	32,91	-14,91
								39,4	-16,11	20,76	-13,95
								24,9	-14,79	13,1	-12,82
								15,7	-14,19	8,27	-13,02
G 5-2a1	Cooling	Yes	125	1190	1100	0,72	0	9,91	-14,19	5,22	-14,75
								6,25	-15,6	-	-
								246	-22,65	143,7	-21,18
								154,9	-20,55	90,7	-18,66
								97,7	-19,01	57,2	-16,38
								61,7	-17,58	36,09	-14,99
								38,9	-16,06	22,77	-14,21
								24,6	-14,97	14,37	-12,95
								15,49	-14,41	9,07	-13,04
								9,77	-14,04	5,72	-14,58
								6,17	-14,58	-	-
								295	-22,78	187,8	-21,79
								186	-20,14	118,5	-19,17
								117,6	-18,33	74,7	-16,45
G 5-2a2	Cooling	Yes	125	1190	1100	0,72	0	74,2	-16,84	47,2	-14,31
								46,8	-15,37	29,76	-13,01
								29,5	-13,89	18,78	-12,1
								18,6	-13,23	11,85	-11,92
								11,76	-13,04	7,47	-12,28
								7,42	-13,44	4,72	-11,59
								4,68	-13,31	-	-
								295	-22,78	187,8	-21,79
								186	-20,14	118,5	-19,17
								117,6	-18,33	74,7	-16,45
								74,2	-16,84	47,2	-14,31
								46,8	-15,37	29,76	-13,01
								29,5	-13,89	18,78	-12,1
								18,6	-13,23	11,85	-11,92
G 5-3	Cooling	Yes	125	1190	1050	1,12	0	11,76	-13,04	7,47	-12,28
								7,42	-13,44	4,72	-11,59
								4,68	-13,31	-	-
								295	-22,78	187,8	-21,79
								186	-20,14	118,5	-19,17
								117,6	-18,33	74,7	-16,45
								74,2	-16,84	47,2	-14,31
								46,8	-15,37	29,76	-13,01
								29,5	-13,89	18,78	-12,1
								18,6	-13,23	11,85	-11,92
								11,76	-13,04	7,47	-12,28
								7,42	-13,44	4,72	-11,59
								4,68	-13,31	-	-
								295	-22,78	187,8	-21,79

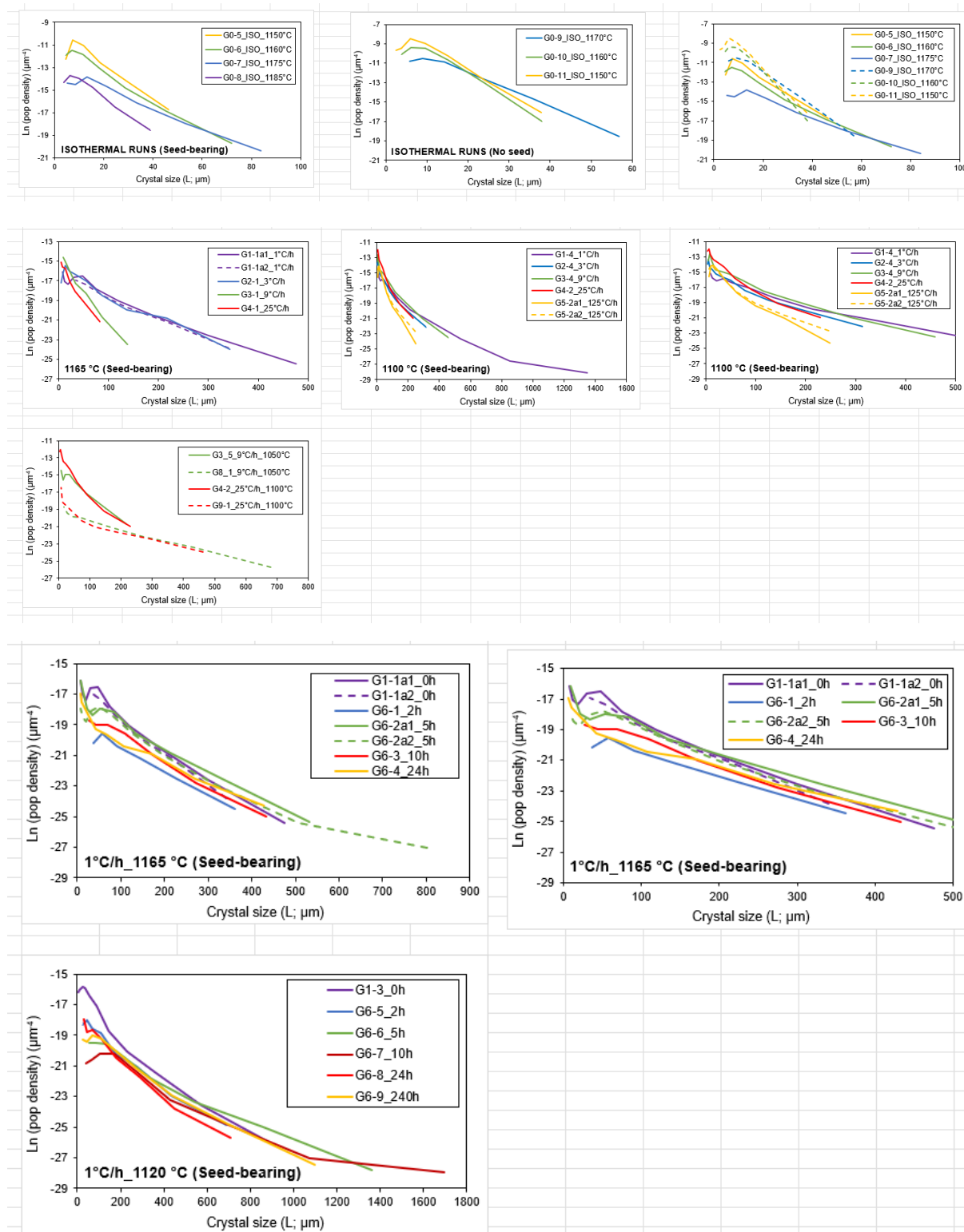
G 8-1	Cooling	No	9	1190	1050	15,56	0	679	-25,69	272,1	-22,17
								429	-23,39	171,7	-19,79
								271	-22,18	108,3	-18,3
								171	-21,12	68,4	-17,86
								108	-20,37	43,1	-18,3
								67,9	-19,96	27,21	-17,5
								42,9	-19,82	17,17	-19,38
								27,1	-19,45	10,83	-17,67
								17,1	-18,72	4,31	-14,29
								-	-	-	-
G 8-2	Cooling	No	9	1190	1000	21,11	0	892	-25,87	682	-24,98
								563	-23,7	430	-22,56
								355	-21,43	271,3	-20,5
								224	-20,49	171,2	-18,81
								141,3	-19,74	108	-17,96
								89,2	-19,59	68,2	-17,55
								56,3	-20,62	43	-17,32
								-	-	27,13	-18,19
								-	-	-	-
								-	-	-	-
G 9-1	Cooling	No	25	1190	1100	3,6	0	463	-23,91	215,9	-21,51
								292	-22,43	136,2	-19,2
								184	-21,61	86	-18,15
								116,3	-21,05	54,24	-17,98
								73,4	-20,35	34,22	-18,11
								46,3	-21,42	21,59	-16,95
								29,2	-21,57	13,62	-17,67
								18,4	-20,26	8,6	-15,99
								11,63	-18,18	-	-
								7,34	-16,46	-	-
G 9-2	Cooling	No	25	1190	1050	5,6	0	4,63	-	-	-
								2,92	-	-	-
								1,84	-14,36	-	-
								1021	-24,95	649,3	-23,59
								644	-23,09	409,7	-21,19
								406	-22,72	258,5	-19,87
								256	-22,15	163,1	-19,46
								161,8	-21,48	102,9	-19,36
								102,1	-21,24	64,93	-19,6
								64,4	-21,75	40,97	-18,67
								40,6	-	25,85	-18,86
								25,6	-	16,31	-
								16,18	-	10,29	-16,22
								10,21	-	-	-
								6,44	-	-	-
								4,06	-	-	-
								2,56	-14,77	-	-
								-	-	-	-
								-	-	-	-
								-	-	-	-

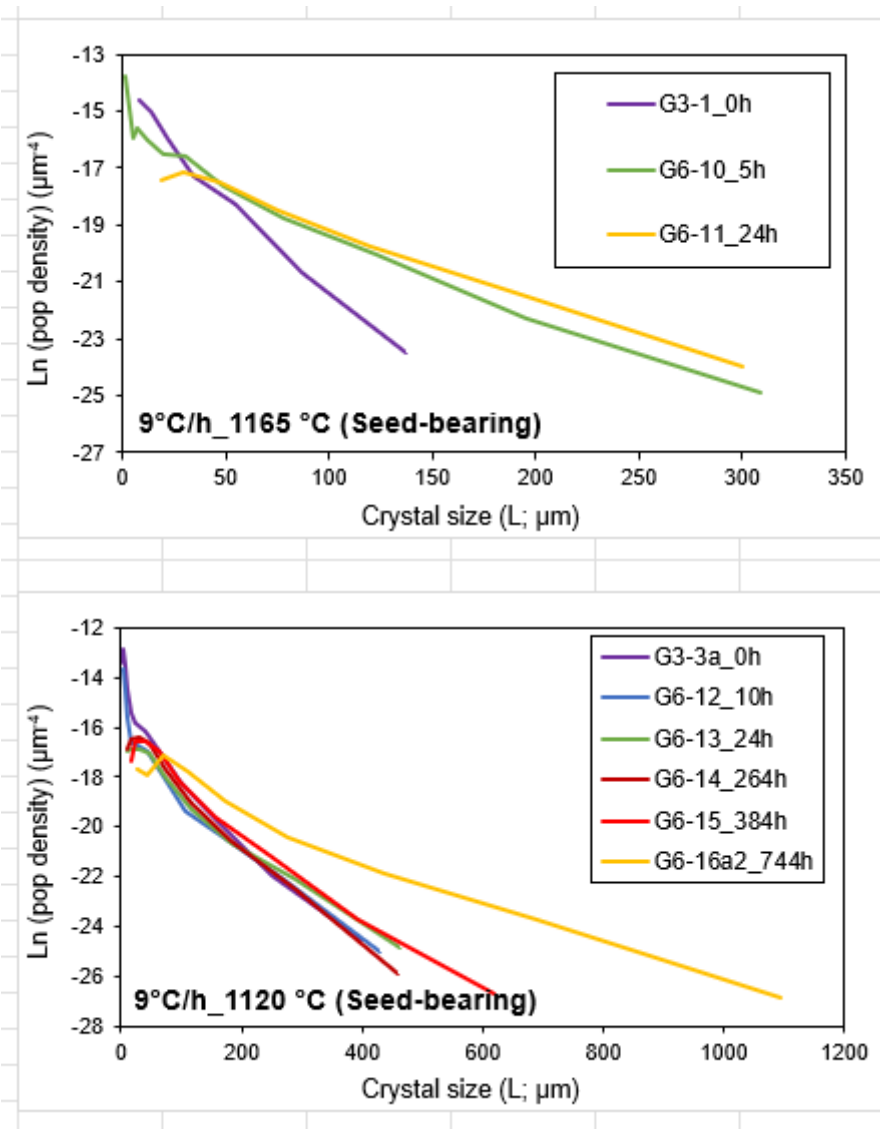
Sample	Type	Seed-bearing	Cooling rate (°C/h)	T _i (°C)	T _f (°C)	t _{cooling} (hours)	t _{anneal} (hours)	CSD plot (log10 size scale)			
								Using l axis		Using w axis	
								Mid Inter (μm)	ln(pop den) (μm ⁻⁴)	Mid Inter (μm)	ln(pop den) (μm ⁻⁴)
G 6-1	Cooling	Yes	1	1190	1165	25	2	362,4	-24,47	237,6	-22,58
								228,6	-22,51	149,9	-20,89
								144,3	-21,22	94,6	-19,49
								91	-20,41	59,67	-19,66
								57,4	-19,55	37,65	-18,95
								36,24	-20,19	23,76	-18,54
G 6-2a1	Cooling	Yes	1	1190	1165	25	5	532	-25,31	226,8	-20,98
								335,8	-22,6	143,1	-18,93
								211,9	-20,81	90,3	-17,87
								133,7	-19,58	56,98	-17,43
								84,4	-18,17	35,95	-17,28
								53,2	-17,95	22,68	-16,74
								33,58	-18,34	14,31	-17,29
								21,19	-17,97	9,03	-16,17
								13,37	-	-	-
								8,44	-16,13	-	-
G 6-2a2	Cooling	Yes	1	1190	1165	25	5	802	-27,04	350,5	-23,88
								506	-25,44	221,1	-21,49
								319,3	-22,95	139,5	-19,12
								201,5	-21,05	88	-17,84
								127,1	-19,56	55,55	-17,54
								80,2	-18,38	35,05	-16,98
								50,6	-17,78	22,11	-17,31
								31,93	-18,07	13,95	-18,22
								20,15	-18,79	-	-
								12,71	-18,5	-	-
G 6-3	Cooling	Yes	1	1190	1165	25	10	8,02	-17,94	-	-
								433	-25	281,5	-23,62
								273,1	-22,79	177,6	-20,71
								172,3	-20,98	112,1	-19,05
								108,7	-19,59	70,7	-18,65
								68,6	-18,97	44,61	-18,21
G 6-4	Cooling	Yes	1	1190	1165	25	24	43,3	-19	28,15	-18,53
								27,31	-18,69	17,76	-16,68
								429	-24,29	299,4	-22,78
								270,5	-22,54	188,9	-20,78
								170,6	-20,93	119,2	-19,7
								107,7	-20,44	75,2	-18,95
								67,9	-19,64	47,46	-19,08
								42,9	-19,28	29,94	-18,74
								27,05	-	18,89	-17,49
								17,06	-	11,92	-17,16
								10,77	-17,54	-	-
								6,79	-16,95	-	-

G 6-5	Cooling	Yes	1	1190	1120	70	2	690	-24,83	547,6	-25,17
								435	-22,98	345,5	-22,17
								274,8	-21,02	218	-19,69
								173,4	-20,2	137,5	-18,43
								109,4	-18,88	86,8	-17,89
								69	-18,55	54,76	-18,12
								43,5	-18,02	34,55	-17,26
								27,48	-18,27	21,8	-16,88
								1360	-27,81	634,8	-24,56
G 6-6	Cooling	Yes	1	1190	1120	70	5	858	-25,02	400,5	-21,77
								542	-23,34	252,7	-19,91
								341,7	-21,79	159,4	-19,22
								215,6	-20,38	100,6	-19,02
								136	-19,57	63,48	-19
								85,8	-19,5	40,05	-18,75
								54,2	-19,53	25,27	-17,18
								1698	-27,92	855	-25,84
								1072	-27,05	539,2	-24,02
G 6-7	Cooling	Yes	1	1190	1120	70	10	676	-24,71	340,2	-21,23
								427	-23,24	214,7	-20,14
								269,2	-21,32	135,4	-19,53
								169,8	-20,23	85,5	-19,68
								107,2	-20,21	53,92	-18,64
								67,6	-20,62	34,02	-18,33
								42,7	-20,82	-	-
								711	-25,72	384,3	-23,26
								449	-23,78	242,5	-20,87
G 6-8	Cooling	Yes	1	1190	1120	70	24	283	-21,71	153	-18,98
								178,6	-20,49	96,5	-18,27
								112,7	-19,25	60,9	-18
								71,1	-18,66	38,43	-17,37
								44,9	-18,82	24,25	-16,71
								28,3	-17,96	15,3	-17,52
								1100	-27,48	537,1	-23,85
								694	-24,75	338,9	-21,49
								438	-22,92	213,8	-19,67
G 6-9	Cooling	Yes	1	1190	1120	70	240	276,3	-21,16	134,9	-18,9
								174,3	-19,98	85,1	-18,43
								110	-19,23	53,71	-18,2
								69,4	-18,99	33,89	-17,21
								43,8	-19,41	21,38	-18,78
								27,63	-19,28	13,49	-18,11
								309	-24,86	234,5	-24,05
								195,1	-22,25	147,9	-20,93
								123,1	-20,03	93,3	-19,02
G 6-10	Cooling	Yes	9	1190	1165	2,78	5	77,7	-18,75	58,9	-17,22
								49	-17,64	37,16	-16,47
								30,9	-16,61	23,45	-16,05
								19,51	-16,54	14,79	-15,14
								12,31	-16,01	9,33	-14
								7,77	-15,58	5,89	-14,63
								4,9	-15,93	3,716	-
								3,09	-	2,345	-14,43
								1,951	-	-	-
G 6-11	Cooling	Yes	9	1190	1165	2,78	24	1,231	-13,78	-	-
								300	-23,95	224,3	-23,44
								189,2	-21,34	141,5	-20,44
								119,4	-19,77	89,3	-18,2
								75,3	-18,5	56,3	-17,07
								47,5	-17,48	35,55	-16,7
								30	-17,13	22,43	-16,44
								18,92	-17,41	14,15	-15,52
								-	-	8,93	-15,73

G 6-12	Cooling	Yes	9	1190	1120	7,78	10	428	-25,02	179,4	-21,04
								270	-22,11	113,2	-18,35
								171	-20,38	71,4	-16,84
								107,6	-19,36	45,1	-16,11
								67,9	-17,88	28,43	-15,58
								42,8	-16,95	17,94	-15,45
								27	-16,69	11,32	-14,01
								17,1	-16,6	7,14	-13,1
								10,76	-15,6	4,51	-13,38
								6,79	-14,44	-	-
								4,28	-13,69	-	-
								2,7	-13,7	-	-
								461	-24,86	279,8	-23,55
G 6-13	Cooling	Yes	9	1190	1120	7,78	24	291	-22,13	176,5	-20,56
								184	-20,67	111,4	-18,17
								115,8	-19,26	70,3	-16,84
								73,1	-18,03	44,3	-16,25
								46,1	-17,01	27,98	-15,89
								29,1	-16,86	17,65	-15,13
								18,4	-16,87	11,14	-15
								11,58	-16,95	7,03	-16,06
								460	-25,88	168,8	-20,66
								290	-22,52	106,5	-18,14
G 6-14	Cooling	Yes	9	1190	1120	7,78	264	183	-20,6	67,2	-16,5
								115,6	-19,03	42,4	-15,64
								73	-17,72	26,75	-15,25
								46	-16,61	16,88	-15,07
								29	-16,44	10,65	-16,26
								18,3	-16,46	-	-
								11,56	-16,85	-	-
								7,3	-	-	-
								4,6	-	-	-
								2,9	-	-	-
G 6-15	Cooling	Yes	9	1190	1120	7,78	384	183	-14,83	-	-
								620	-26,67	215,5	-21,67
								391	-23,74	135,9	-18,58
								247	-21,14	85,8	-16,79
								155,8	-19,6	54,1	-15,96
								98,3	-18,2	34,15	-15,62
								62	-16,96	21,55	-15,54
								39,1	-16,56	13,59	-15,96
								24,7	-16,56	8,58	-15,52
								15,58	-17,38	-	-
G 6-16a1	Cooling	Yes	9	1190	1120	7,78	744	576	-25,76	222,5	-21,31
								364	-22,67	140,4	-18,93
								229	-20,95	88,6	-16,83
								144,8	-19,45	55,9	-15,71
								91,4	-18,12	35,26	-15,24
								57,6	-16,96	22,25	-15,31
								36,4	-16,18	14,04	-15,85
								22,9	-16,03	-	-
								14,48	-16,66	-	-
								1094	-26,9	364,1	-21,82
G 6-16a2	Cooling	Yes	9	1190	1120	7,78	744	690	-23,71	229,7	-19,36
								435	-21,85	144,9	-17,5
								274,8	-20,39	91,4	-16,46
								173,4	-18,94	57,7	-16,42
								109,4	-17,79	36,41	-16,73
								69	-17,09	22,97	-16,91
								43,5	-17,91	14,49	-17,39
								27,48	-17,69	-	-
								1094	-26,9	364,1	-21,82
								690	-23,71	229,7	-19,36

DIAGRAMS





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first draft of the manuscript was written by Billon Melvyn and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability

Supplementary data are available at Journal of Petrology online, and also in Zenodo repository at <https://doi.org/10.5281/zenodo.18311920>; but are subject to an embargo until the publication .

Declarations

Conflict of interest Not applicable.

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