A-type magmatic suites as tracers of the lower crust

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During the waning stage of the Sveconorwegian (Grenvillian) collision orogeny, abundant magmatism took place in SW Baltica. A typical *Anorthosite-Mangerite-Charnockite-Granite (AMCG) suite*, the Rogaland anorthosite complex (0.93 Ga), intruded the westernmost part of the orogen and is restricted to this area (SW Norway). On the other hand, numerous *hornblende and biotite-bearing granitoids (HBG)* (0.96-0.92 Ga) outcrop from Rogaland-Vest Agder in Norway to the Idefjorden terrane in Sweden and are concentrated along two major fault-shear zones. Both magmatic suites (50% up to 75% SiO_2) are ferroan, alkali-calcic to alkalic with high contents of LILE+HFSE but display significant differences: in the AMC suite, K_2O, $FeO_t/(FeO_t + MgO)$, Zr are higher whereas CaO, P_2O_5, TiO_2, Sr and Th are lower than in the HBG suite. Despite these differences, both have an A-type geochemical signature which is recognized in the parent magmas and/or inferred sources, indicating that it does not result from differentiation processes. In particular, in the mafic facies of both suites, the Zr+Nb+Ce+Y content is already very high. With differentiation, these incompatible elements further increase up to the crystallization of accessory phases, which occurs late, leaving very high concentration of these elements until the latest stages of differentiation. The differences between the AMC and HGB sources, such as a lower f_{O2} and f_{H2O} in the AMC suite, will not be addressed here; let us just note that the AMC source has been determined to be the mafic lower crust. The most striking difference between the two magmatic suites is particularly well shown by the Sr, Nd, Pb isotopes. Mafic facies from the two suites have similar depleted Sr_i, $^{207}Pb/^{204}Pb$, $^{206}Pb/^{204}Pb$ and ε_{Nd} (although with slightly higher ε_{Nd} in the AMC suite), but with increasing differentiation, the two suites evolve along two very different trends towards enriched isotopic compositions. This indicates two different crustal contaminants. In the AMC suite, the average pre-Sveconorwegian basement, characterized by enriched signatures in Sr, Nd and Pb isotopes, appears as a plausible contaminant implying contamination of an isotopically more primitive crustal melt originated in the mafic lower crust by a felsic lower crust. In the HBG suite, the contaminant has strongly negative ε_{Nd} and strongly depleted Sr_i and $^{207}Pb/^{204}Pb$, $^{206}Pb/^{204}Pb$ and is not yet determined. We suggest that the contrasting geochemistries, f_{O2}, f_{H2O} and isotopic compositions of these two penecontemporaneous magmatic suites witness different crustal segments, probably located in different terranes.