

Physicochemical properties and thermal behaviour of African wild mango (*Irvingia gabonensis*) seed fat.



Science des Aliments & Formulation
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Irvingia gabonensis (Africa Mango) is recognized for its numerous food and medicinal uses in Africa. This plant produces seeds rich in fat, which is traditionally used as a soup thickener. In this study, the fat from *I. gabonensis* seeds was solvent extracted. Beside a chemical characterization, the melting and crystallization behaviours of the extracted fat were studied by complementary techniques (pNMR, DSC and powder X-ray Diffraction) in order to get basic information regarding its physical properties and more particularly, about its polymorphism.

Introduction



Material and Methods

Samples

Mature fruits collected from the botanic garden of Kisantu (D.R. Congo)

Methods

Fatty acid profile :
AOCS Ce 2-66

DSC melting profiles using a Q1000 DSC (TA instruments) according to AOCS method (Cj 1-94)

SFC profiles by pNMR: according to IUPAC 2.150 using tempered & non tempered serial methods

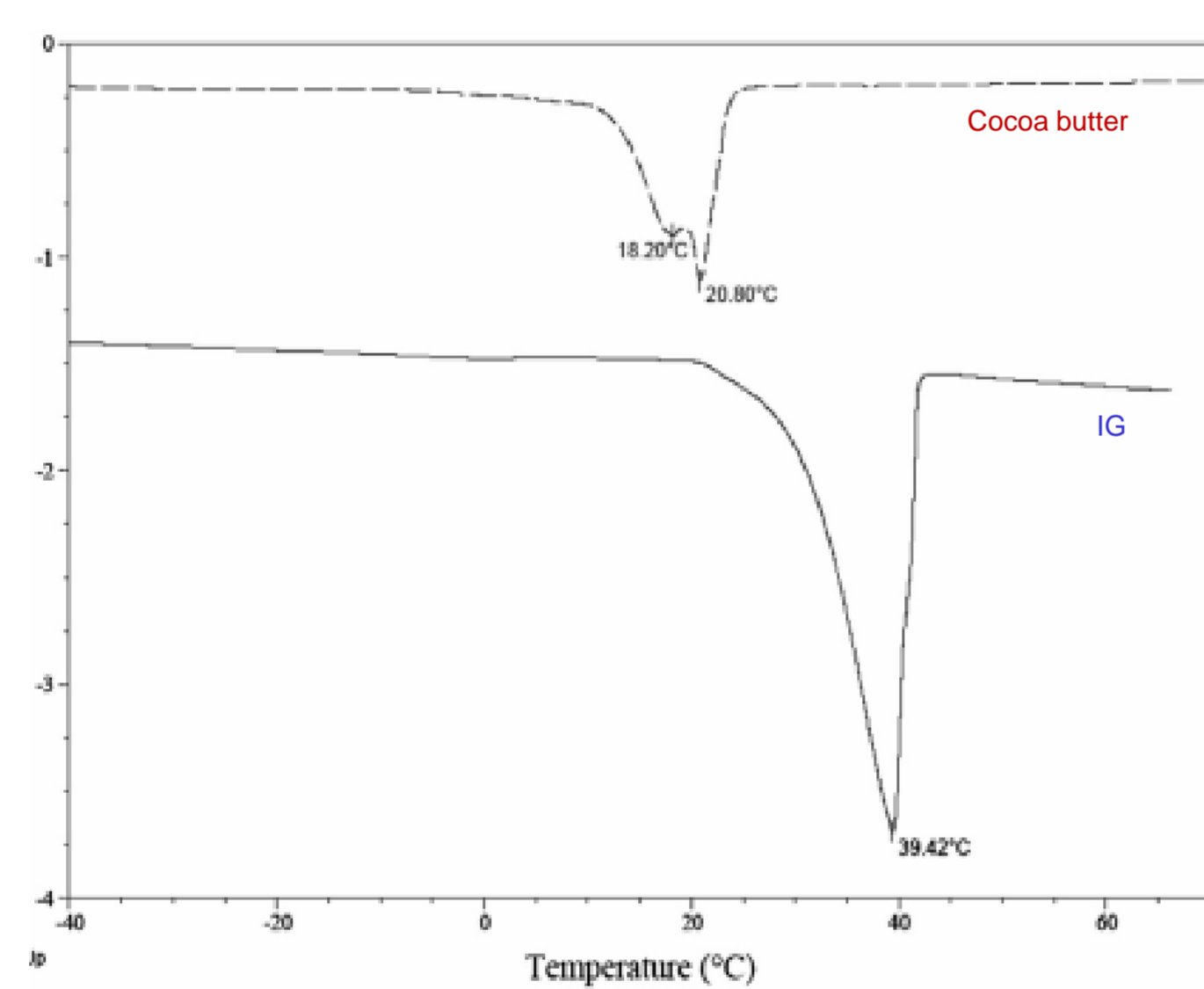
Polymorphism by powder-XRD (Bruker D8-Advance + Vantec detector +TTK450 chamber) Dynamic & isothermal crystallizations

Results

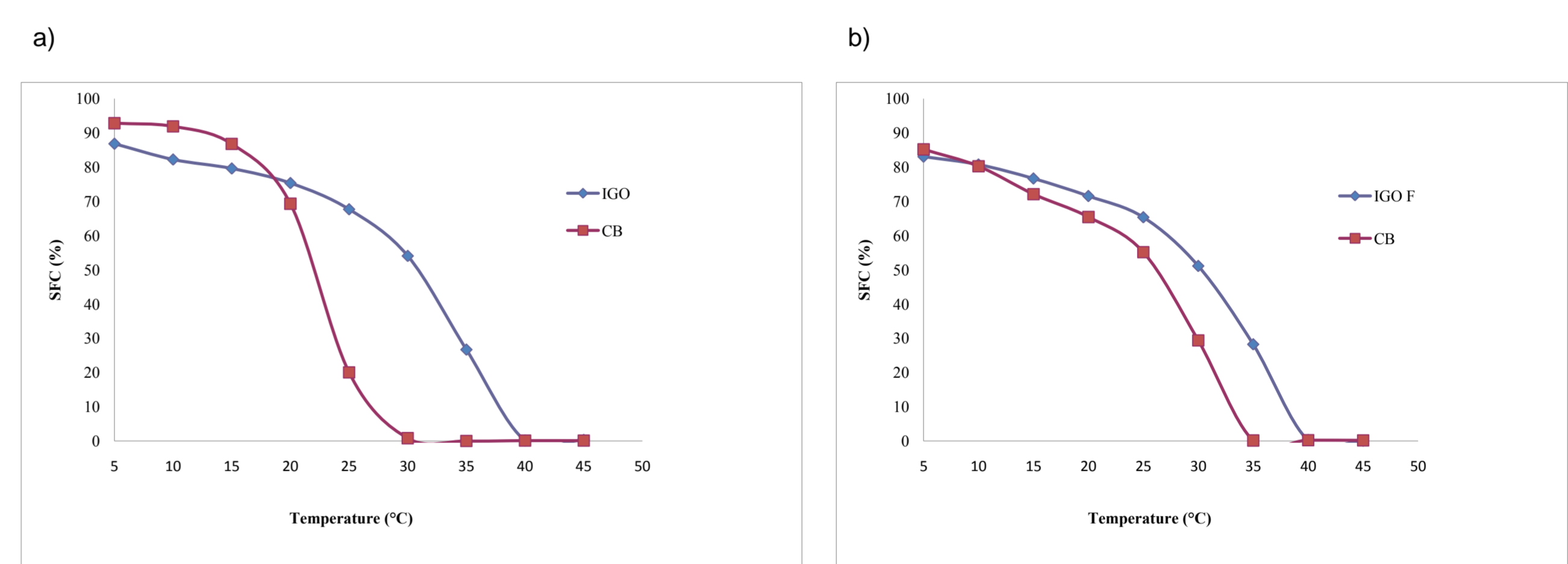
1. FA profile

	%
C 10:0	1.2±0.03
C 12:0	37.11±0.33
C 14:0	49.83±0.17
C 16:0	5.51±0.02
C 18:0	0.89±0.03
C 18:1 n-9	4.31±0.17
C 18:2 n-6	1.09±0.05
SAFA	94.54
UnSAFA	5.4
C 12+ C 14	86.94

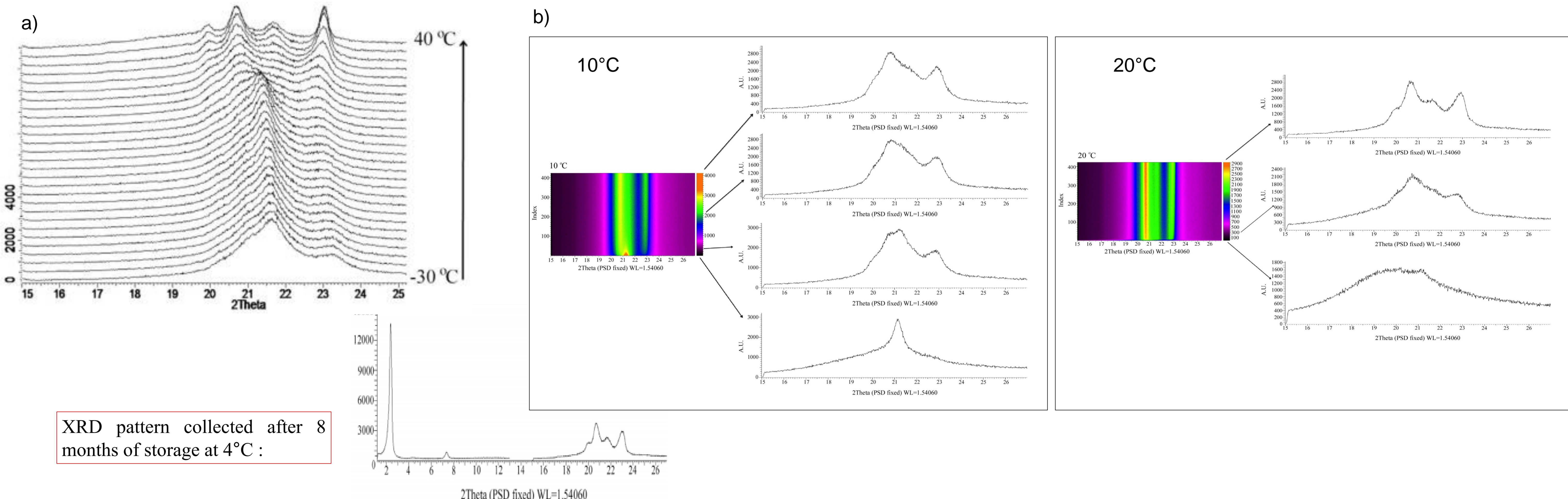
2. DSC melting profile



3. SFC melting profiles: non-tempered (a) and tempered (b)



4. Polymorphism by powder-XRD : patterns recorded during (a) Heating (5°C/min) and (b) Isothermal crystallizations



Conclusions

- 1) IG can be viewed as an important source of lipids, rich in lauric and myristic acids.
- 2) Due to its high SAFA content, IG fat presents a high SFC content at room temperature, even in tropical countries.
- 3) The melting profiles of IGF can be compared to that of cocoa butter, but the melting point of IGF is higher, even after tempering, which has moreover no effect on IGF thermal properties.
- 4) The most stable form of IGF is β'_1 -form (not β) even after tempering and storage, contrarily to cocoa butter.
- 5) Due to its high stability in β'_1 -form, it can be expected that the manufacturing of IGF would not need any tempering to induce a stable conformation.