

Poster Presentation

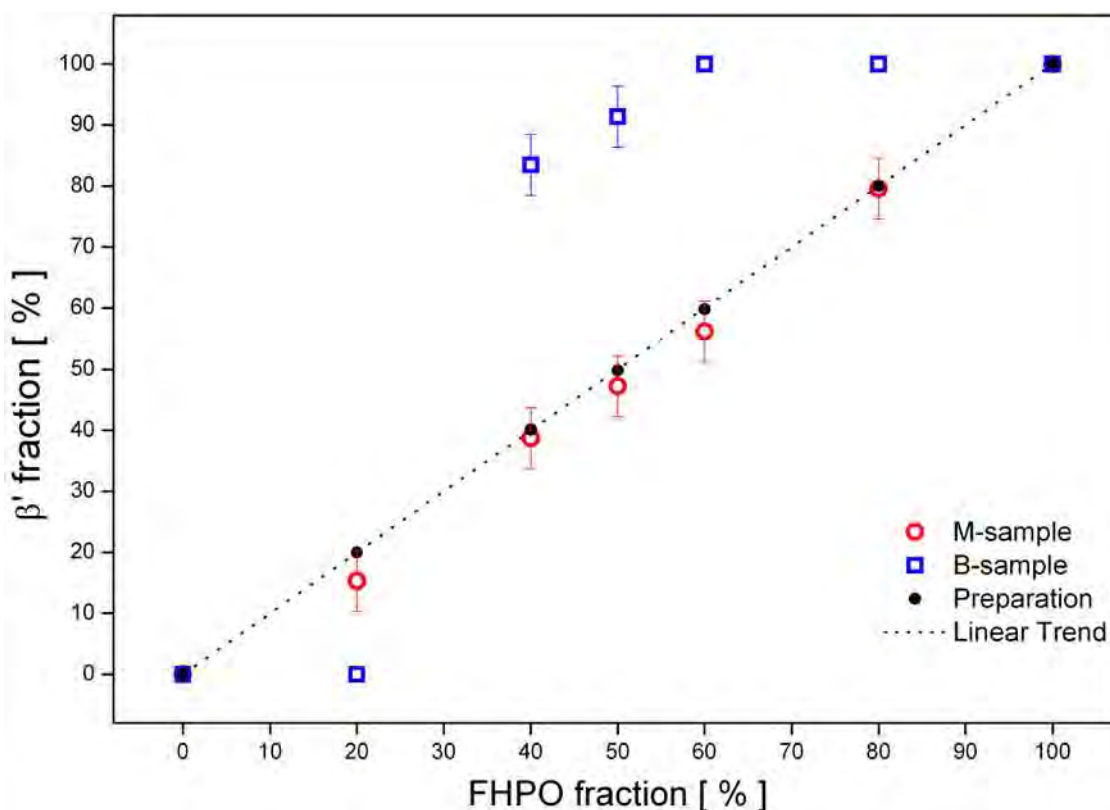
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Rietveld Method Applied for Triacylglycerol Polymorphism Analysis

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The characterization of the fat components becomes very useful in the formulation of shortening, margarines and fatty products due to their unique properties of plasticity, texture, solubility and aeration. The qualitative analysis obtained by X-ray diffraction (XRD) can be further improved in order to fulfill the lack of information on the triacylglycerol (TAG) in the hardfat systems aiming a complete polymorph characterization. In this work, as an attempt to quantify the distinct β and β' TAG polymorphs, XRD was combined with Rietveld refinement method and applied to two types of samples: mixtures (M) and blended hardfats (B) samples involving fully hydrogenated of soybean (FHSO) and palm (FHPO) oils. M-samples were prepared with linear concentrations of FHSO (β) and FHPO (β') and their Rietveld analysis have provided the expected content trend through the involved polymorphic phases with a very good agreement ($\sim 5\%$). This result validates the Rietveld method applicability on this kind of materials. The Rietveld method applied for B-samples has shown that β' polymorphic form prevails over the β -form, even for samples originally prepared with FHSO (β)/FHPO (β') = 60/40 ratio (see figure). This result indicates the influence of the seeding process (earlier crystallization of β' phase). This first quantitative approach for blended samples represents a very useful contribution towards the full characterization of fats.



Keywords: X-ray Powder Diffraction, Rietveld Method, TAG Materials