

Application of differential scanning calorimetry (DSC), HPLC and pNMR for interpretation primary crystallisation caused by combined low and high melting TAGs.

ABSTRACT

The main goal of the present work was to assess the mechanism of crystallisation, more precisely the dominant component responsible for primary crystal formations and fat agglomerations. Therefore, DSC results exhibited significant effect on temperature transition; peak sharpness and enthalpy at palm stearin (PS) levels more than 40 wt.%. HPLC data demonstrated slight reduction in the content of POO/OPO at PS levels less than 40 wt.%, while the excessive addition of PS more than 40 wt.% increased significantly PPO/POP content. The pNMR results showed significant drop in SFC for blends containing PS less than 40 wt.%, resulting in low SFC less than 15% at body temperature (37 °C). Moreover, the values of viscosity (η) and shear stress (τ) at PS levels over 40 wt.% expressed excellent internal friction of the admixtures. All the data reported indicate that PPO/POP was the major component of primary nucleus developed. In part, the levels of PS should be less than 40 wt.%, if these blends are designed to be used for margarine production.

Keyword: Enthalpy; Fat agglomerations; Internal friction; pNMR; SFC; Temperature transition.