

DSC Studies on the Effect of Sorbitan Esters during Palm Oil Crystallization

Alessia Ermacora, Eckhard Flöter

Unilever R&D, Vlaardingen, The Netherlands

Palm oil is widely used as raw material in the food industry. Because of its composition that implies a semi-solid nature at ambient temperature, in fact, it is used in many food applications, such as margarines, spreads and shortenings. However, the physical properties of the end products are largely affected by the form in which palm oil crystallizes: both the polymorphic form and the composition of the crystals can have an impact on the final product characteristics. It is well known that surfactants can affect the crystallization process by promoting or retarding polymorphic transitions and influencing the degree of mixing of the glycerides in the crystals.

Recent studies have shown that sorbitan esters have crystal habit modifying properties. In this contribution the effect of a mixture (1:1 w/w) of sorbitan monopalmitate and sorbitan monostearate (Span 60) on palm oil-based blends, studied by Differential Scanning Calorimetry (DSC), is discussed. In particular, attention is paid to the experimental conditions (scanning rates during cooling and heating) since they influence the results radically. Various methods were applied in order to enhance the differences between the samples with and without sorbitan esters. Furthermore, variation of Span 60 concentration and the TAG composition allowed to increase the understanding of the specific effects of sorbitan esters on palm oil TAG based compositions.