

Crystallization of Palm Oils by DSC

INTRODUCTION

Classically, crude palm oil has to undergo processes to improve its qualities before being proposed on the market. In a first step, an absorption bleaching is performed to produce refined palm oil. This latter is constituted by a liquid phase and a solid phase which could be separated by a fractionation process. This process is based on the crystallization temperature of each phase, that is why, the thermal profile of palm oil should be clearly established.

EXPERIMENT

Atmosphere: nitrogen N_2 , atmospheric pressure

Sample mass: about 20 mg in a 100 μ l aluminum crucible

Experimental procedure:

- +60 \rightarrow -60°C at different temperature scanning rates
- isotherm at -60°C during 30 min
- -60 \rightarrow +60°C at the same rate

RESULTS AND CONCLUSION

On the PO thermogram (figure 1), the two main peaks represent the low and high melting points fractions. These fractions are Olein (peak 1) (liquid at room temperature) and Stearin (peak 2) (solid at room temperature). The temperature range between these two peaks is an essential information to control palm oil refining processes.

The PKO thermograms (figure 2) present only one peak even when using a slow temperature ramp. This can be explained because it is particularly concentrated in saturated triglycerides.

It shows that SETLINE DSC is an equipment perfectly adapted to characterize palm oil in terms of crystallization and quality control.

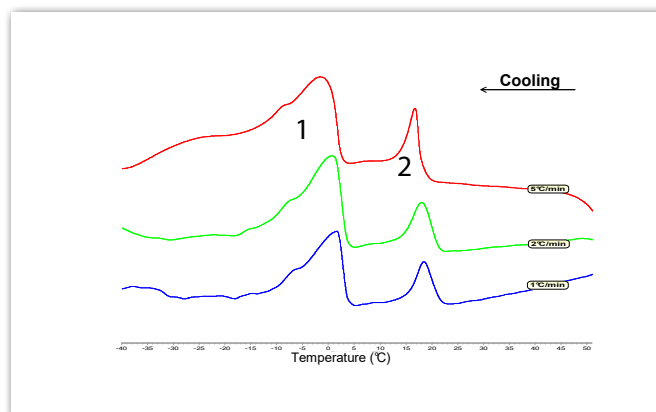


Figure 1 : Cooling thermograms of PO

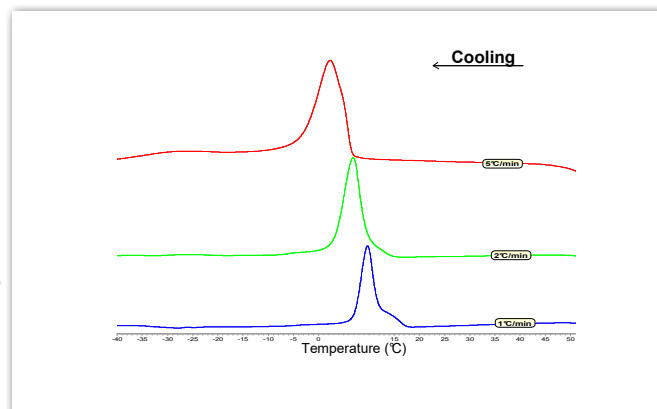


Figure 2 : Cooling thermograms of PKO

INSTRUMENT

SETLINE DSC / DSC+

-170 to 700°C



EASY TO USE WITH ROBUST SENSOR TECHNOLOGY
ensuring quality, consistent and reliable data

AVAILABLE WITH HIGH PRESSURE CRUCIBLES
up to 500 bar at 600°C

REASONABLY PRICED INSTRUMENT & SENSOR
for easy, cost effective replacement

LOWER COST OF OWNERSHIP
through simplified maintenance and a Replacement Parts Guarantee

TECHNICAL & APPLICATION SUPPORT
for fast expert help with any questions

CALISTO 2.0 EXCLUSIVE SOFTWARE
for intuitive and easy data handling