

TECHNOLOGY DESCRIPTION

Each chemical substance has its own melting point. A deviation in melting point of a substance indicates a presence of other components in the substance. Melting point determination through this invention (DSC) method provides information on the number of components present in the mixture through thermal properties resolution (thermogram).

BACKGROUND

Melting point is one of the parameters that can be used to check the purity of a substance. A pure substance generally has a melting range (the difference between the temperature where the sample starts to melt and the temperature where melting is complete) of one or two degrees. Impurities tend to depress and broaden the melting range, while pure samples show a sharp and smaller melting range.

PROBLEM STATEMENT

The ways in which the sample is prepared and the instrument is programmed in the conventional method (slip melting point) have the greatest influence on the accuracy and reproducibility of a melting point measurement. Subjective interpretation of the changes observed in the sample (visually by operators) during the analysis can also lead to inaccurate results.

SERVICE

Objective of the Technology/Service

The objective of the service is to provide quality specifications / standards of oleochemical products in terms of their thermal properties using DSC.

Methodology

The in and out heat flow of a sample and a reference material is measured using DSC as a

function of temperature when the sample is being heated, cooled or held isothermally at constant temperature (*Figure 1*). The measurement signal is the energy absorbed or released by the sample in milliwatts (mw). Results are evaluated using the STAR^e software. The data produced are displayed as a thermoanalytical diagram (*Figure 2*).

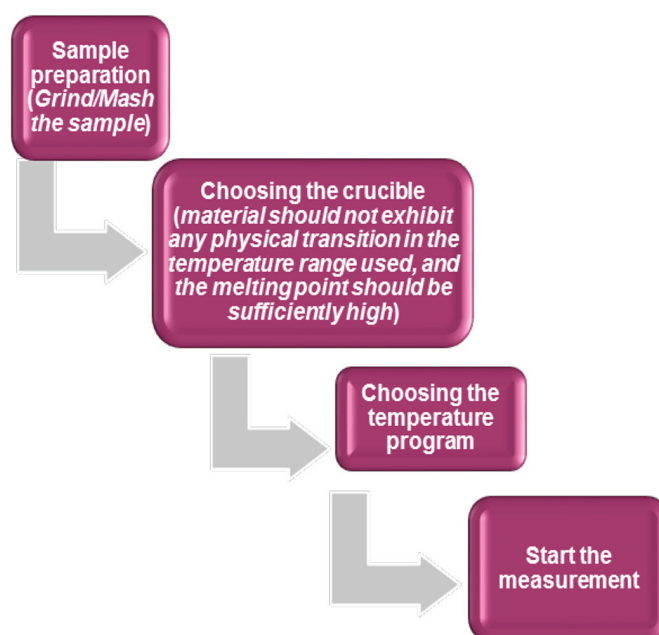


Figure 1. Methodology for the determination of melting point of a chemical using DSC.

NOVELTY OF THE SERVICE

This measurement will give more accurate and reliable data with minimal human errors compared to the conventional method.

Features

- Precision (repeatability and interpersonal comparison);
- Rapid analysis (responsiveness);
- Reliability (crosscheck with commercial laboratory);
- High accuracy (recovery and dependably method analysis); and
- Cost-efficient.

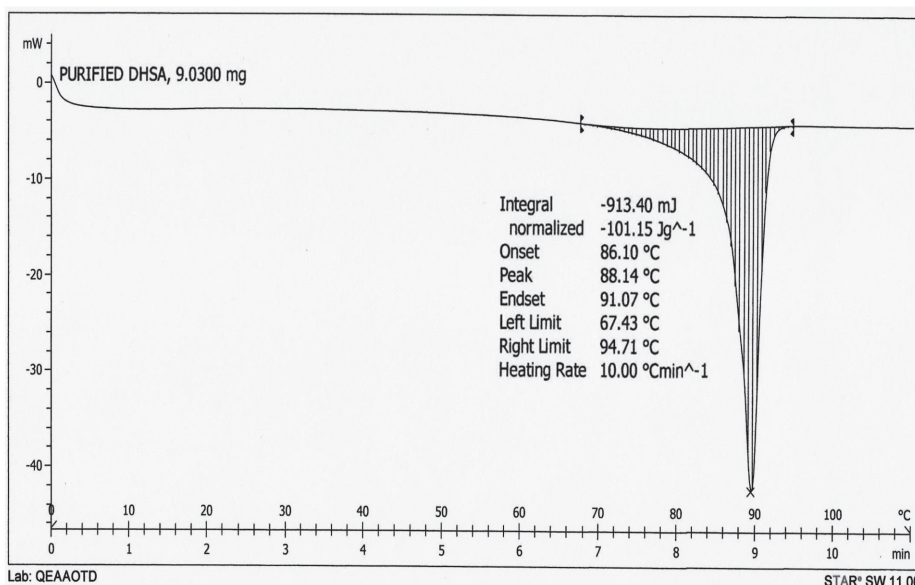


Figure 2. DSC thermoanalytical diagram of palm-based dihydroxystearic acid (DHSAs).

ADVANTAGES

Besides melting point, several other properties may be obtained when using DSC in determination of thermal properties, which are:

- Detection of endothermic and exothermic effects;
- Determination of peak areas (transition and reaction enthalpies);
- Determination of temperatures that characterize a chemical or other effects; and
- Measurement of specific heat capacity.

BENEFITS

- DSC is one of the most used techniques for studying thermal behaviour of various organic substances, characterising palm-based products and other chemicals and also very useful for observing the melting range of a sample.

- The method used is based on OECD 102 *Melting Point / Melting Range*, that enables the data to be used by manufacturers for product registration at the European Chemical Agency (ECHA) under the European Registration, Evaluation, Authorisation and Restriction of Chemical substances (EU REACH) Regulation.

SERVICE OFFERED

Service for determining the thermal properties of palm-based products and other chemicals using DCS method with the following terms:

- Sample (about 5 g).
- Test results in the form of thermoanalytical curve and Certificate of Analysis (COA).

COST OF ANALYSIS

The cost for this analysis is RM 300.00* per sample.
*subject to change

For more information, kindly contact:

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