

Measurement of Partial Calories by Partial Area Measurement Program

Partial calories may draw particular interest during a measurement for calorific information with DSC or DTA. Shimadzu Thermal Analysis System Model TA-50 with a partial area measurement program offers an easy way for getting partial area (calories). In addition, this program also produces a curve that shows a ratio of an area from its onset to any given temperature point versus the whole area. This ratio curve is also useful for calculating SFI (solid fat index), which is a very important factor for evaluation of fat properties. The followings are measurements of partial melting calories of fat and melting calories ratio both obtained with the partial area measurement program, one of the application programs for Shimadzu Thermal Analyzer.

Measurement of butter and margarine

Fig.1 and 2 show partial melting curves of butter and Fig.3 and 4 show similar curves for margarine. Fig.1 is an example of partial calories measurement for two partial areas (20.05J/g and 45.69J/g) ranging from the melting onset temperature (-37.4°C) to the temperature when the two partial melting peaks end (-16.8°C and -3.2°C). Fig.2 shows the temperature at every 10% increment of partial melting calories with the total melting calories (98.79J/g) set to 100%. This curve shows that the sum of partial melting calories reaches 10% of total melting calories at -22.3°C. Similarly, margarine was analyzed as shown in Fig.3 and 4.

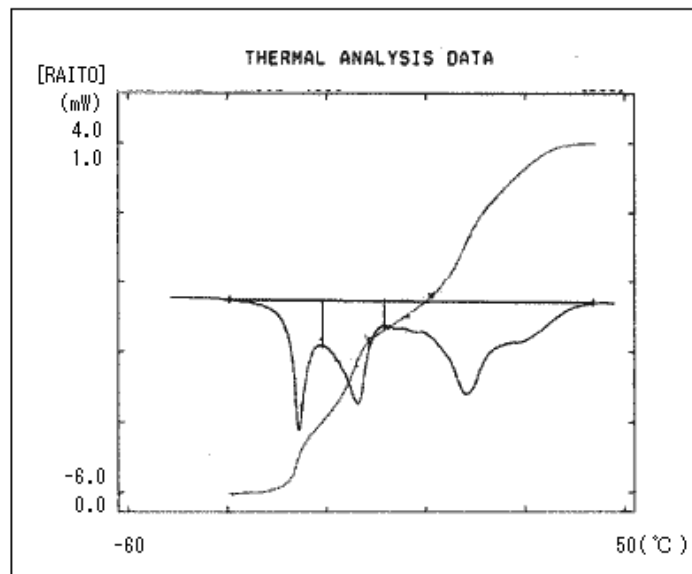


Fig.1 Partial Melting Calories of Butter

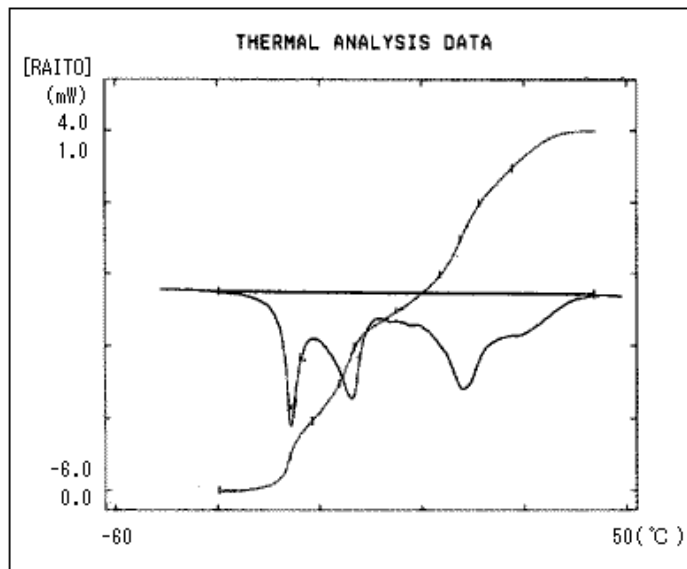


Fig.2 Ratio of Partial vs. Total Melting Calories of Butter

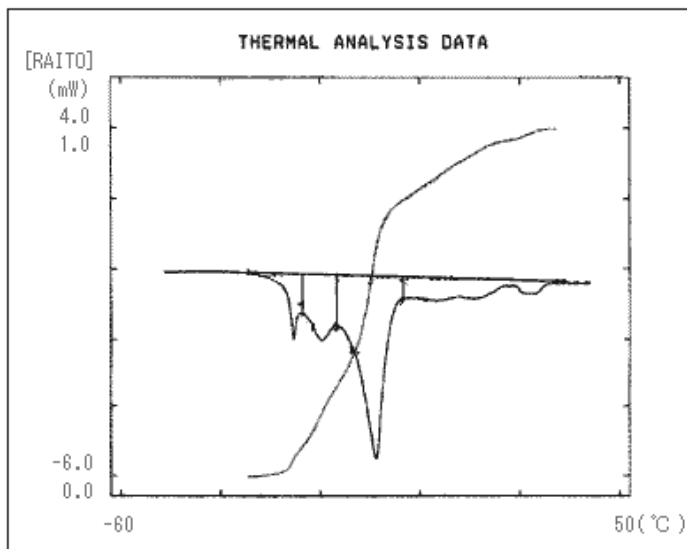


Fig.3 Partial Melting Calories of Margarine

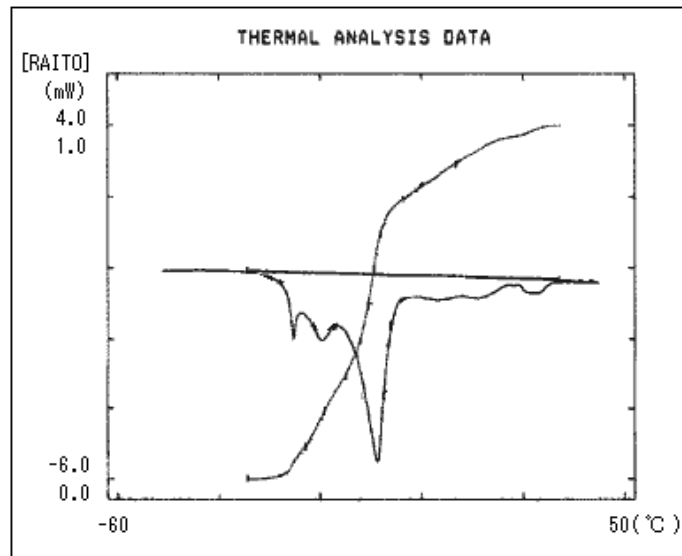


Fig.4 Ratio of Partial vs. Total Melting Calories of Margarine

Measurement of oils and fats

Partial melting calories of palm oil, soybean oil and lard oil are shown in Figs.5, 7, and 9 respectively, and the ratio of a sum of partial melting calories from the onset of melting versus the total melting calories for each are given in Figs.6, 8, and 10 respectively.

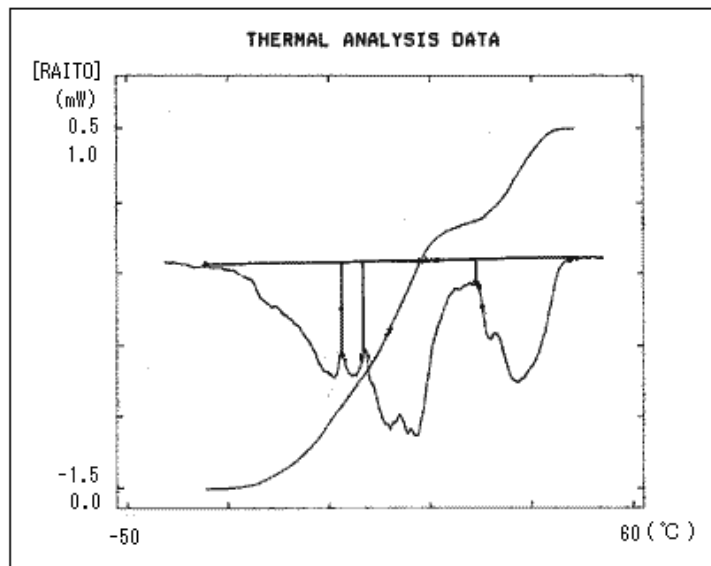


Fig.5 Partial Melting Calories of Palm Oil

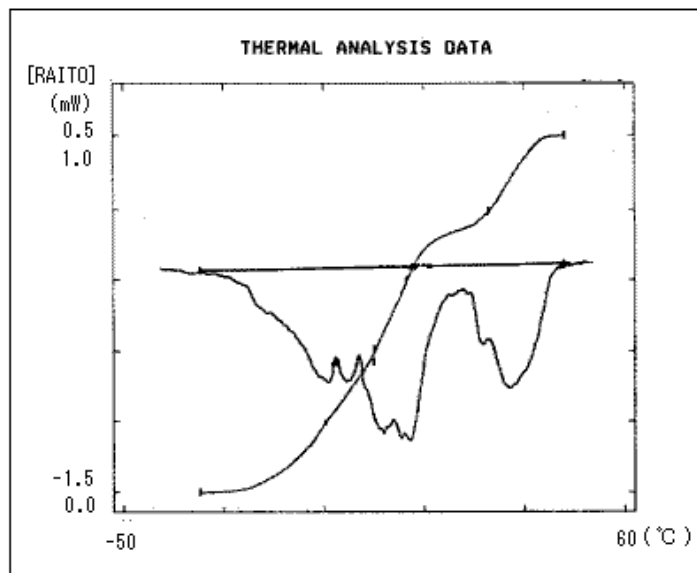


Fig.6 Ratio of Partial vs. Total Melting Calories of Palm oil

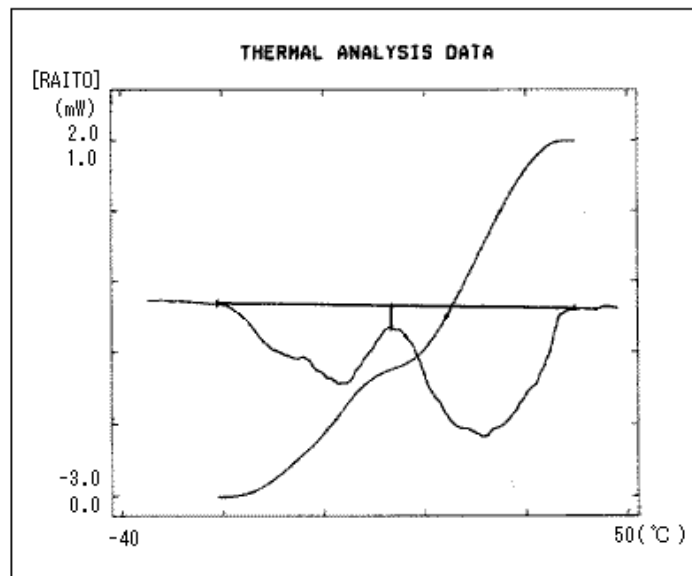


Fig.7 Partial Melting Calories of Soybean Oil

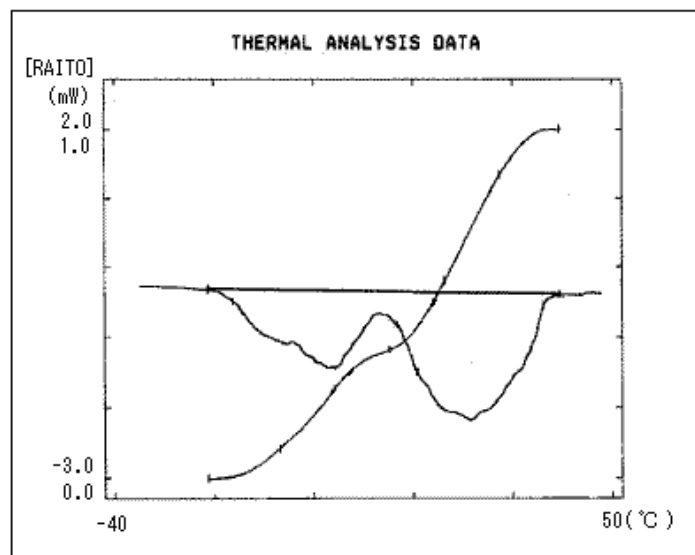


Fig.8 Ratio of Partial vs. Total Melting Calories of Soybean Oil

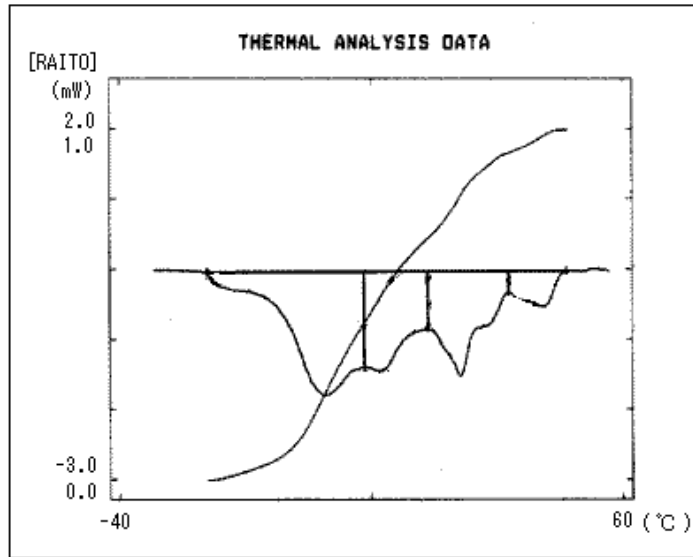


Fig.9 Partial Melting Calorimetry of Lard Oil

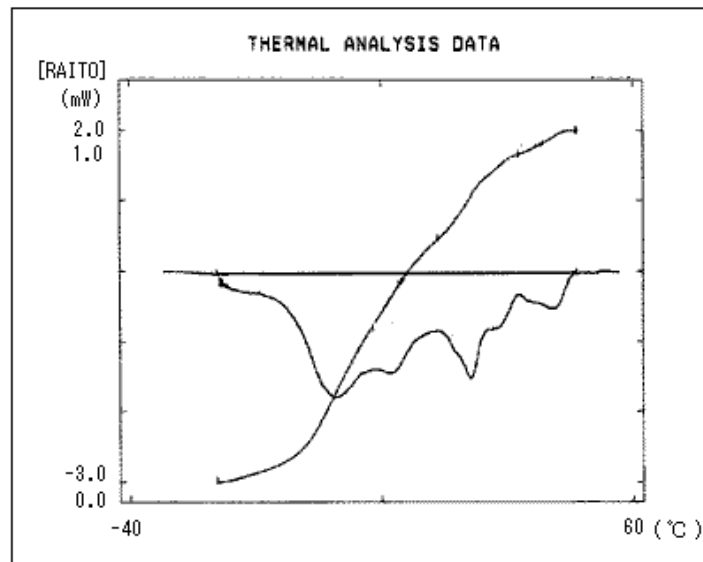


Fig.10 Ratio of Partial vs. Total Melting Calorimetry of Lard Oil

* Please be advised that data obtained before the implementation of the current Weights and Measures Law may be presented in terms of gravimetric unit.



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