

## THERMAL ANALYSIS T99

## DSC by Cyclic Heating/Cooling Program

A freezing point, crystallization temperature or crystallization heat quantity of a substance may be known by means of cooling of a sample at constant rate by DSC. Reported herein are results of cyclic heating/cooling of metals and polymers.

DSC of metal by a cyclic heating/cooling program

Shown below are examples where metals were melted and then crystallized. Measurements of melting temperatures and crystallization temperatures attained consistency through repetition of the cyclic heating/cooling program (Figure 1).

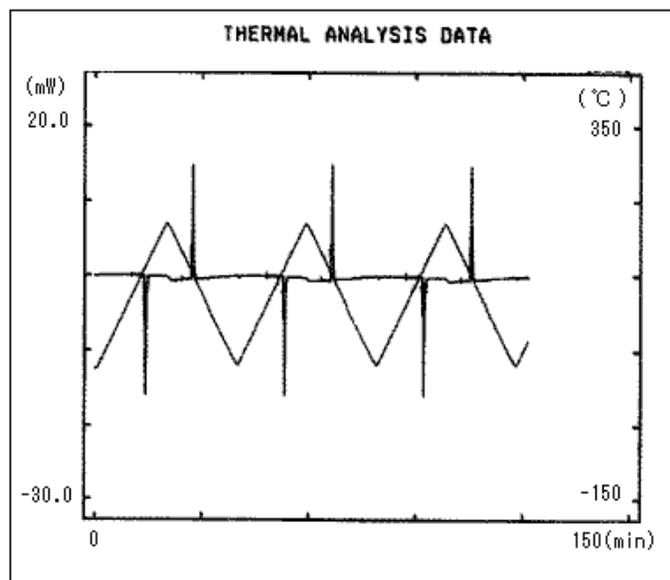


Fig. 1 In

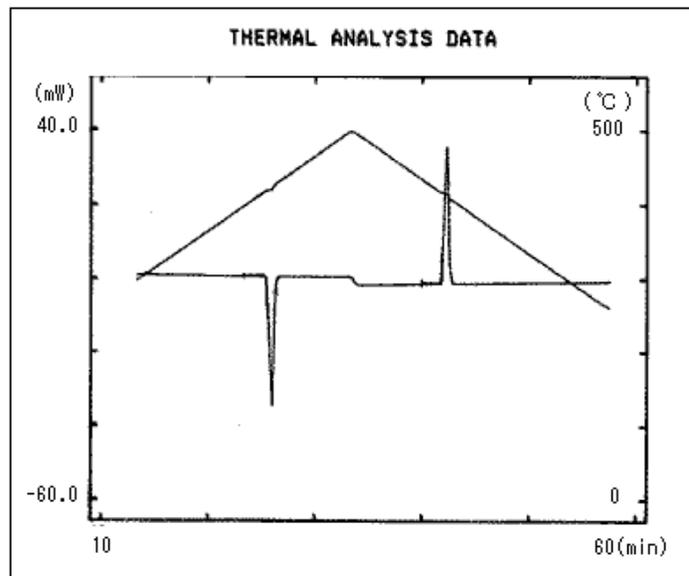


Fig.2 Zn

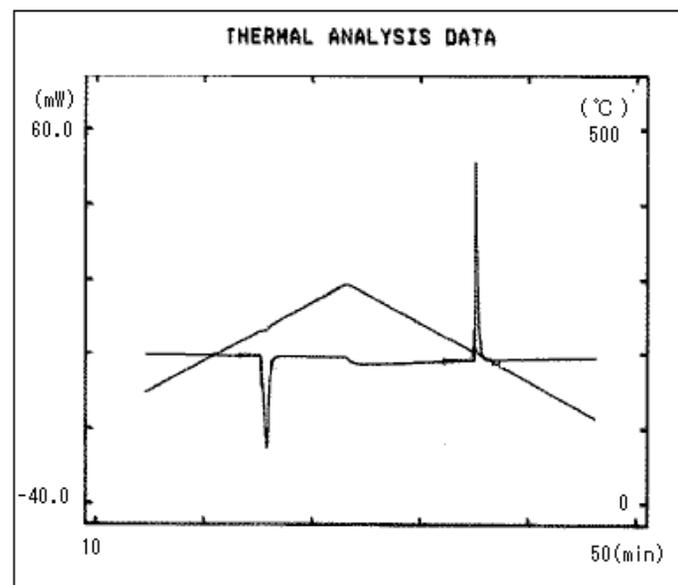


Fig.3 Sn

DSC of polymer by cyclic heating/cooling program

Shown below are examples of measurements showing melting and crystallization temperatures of polymers. As for the melting and crystallization temperatures of polymer, accurate temperature control for heating and cooling ( $5^{\circ}\text{C}/\text{min}$  or  $10^{\circ}\text{C}/\text{min}$ ) must be obeyed per JIS. The  $10^{\circ}\text{C}/\text{min}$  heating and cooling program was adopted here. Differences in melting and crystallization heat quantities at different polymers mixing rates and those in melting and crystallization temperatures of polyethylene polymers at different densities are

reported herein. Furthermore results of heating/cooling programs of representative polymers are exemplified as well.

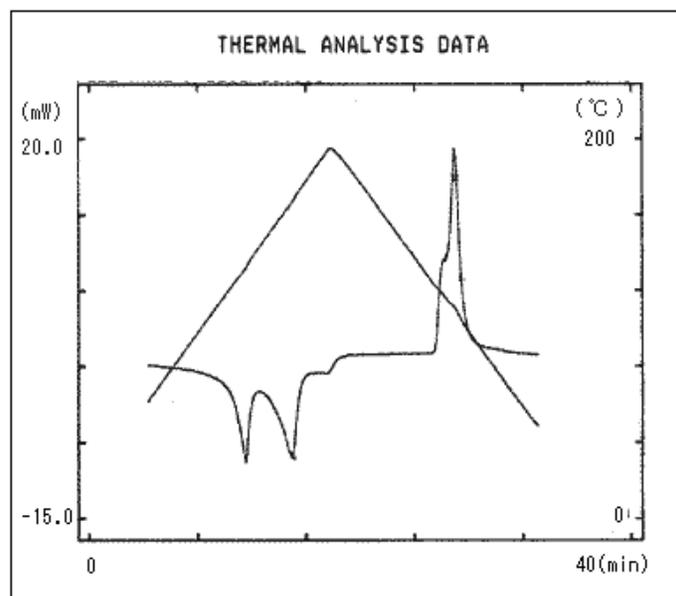


Fig.4 PE : 1.54mg, PP : 8.49mg

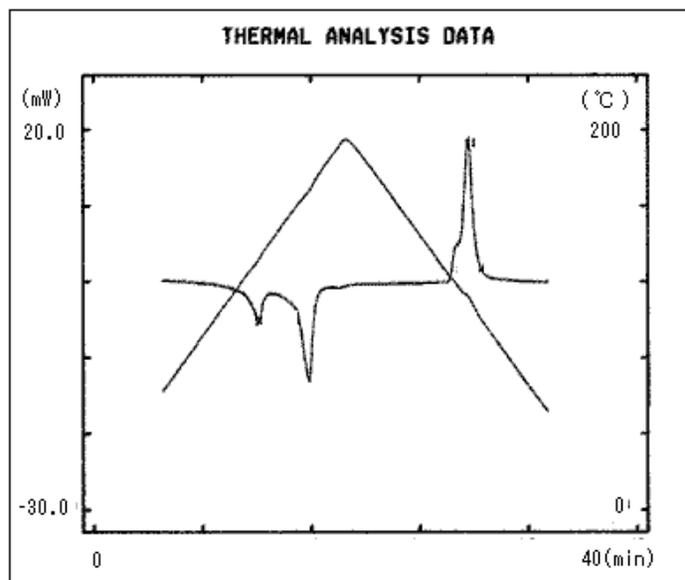


Fig.5 PE : 0.56mg, PP : 8.50mg

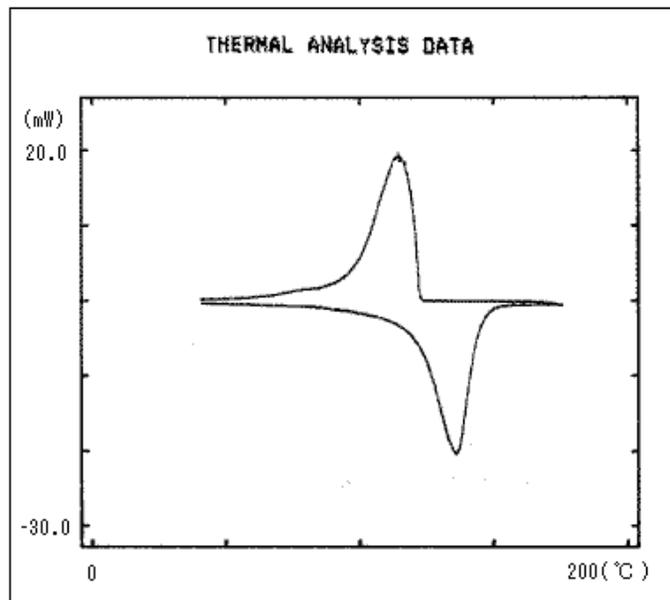


Fig.6 Low-PE

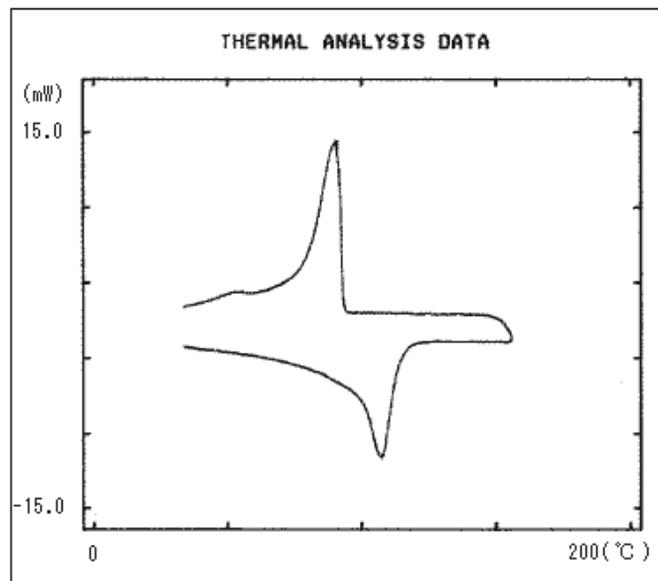


Fig.7 High-PE

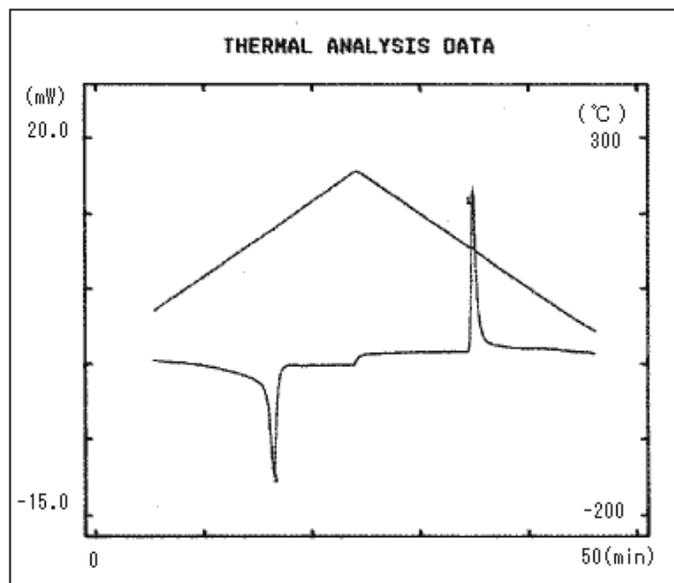


Fig.8 Nylon 12

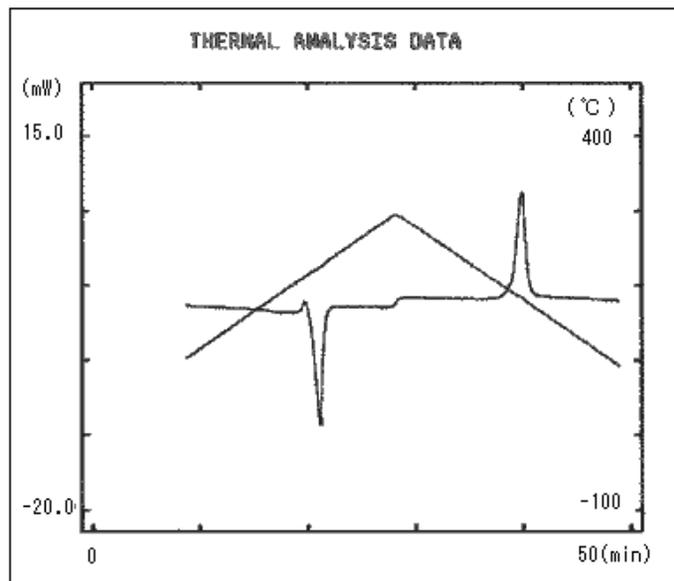


Fig.9 PBT

\* 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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