

## **Advantages of fast Thermal Analysis for polymer characterization**

Rudolf Riesen, Jürgen Schawe  
Mettler-Toledo GmbH, CH-8603 Schwerzenbach, Switzerland

### **ABSTRACT**

Fast measurements were performed using DSC and DMA instruments. The influence of the heating rate on the DSC curve was investigated taking amorphous Poly(ethylene-terephthalate) as an example. At heating rates below 200 K/min re-crystallization effects during the measurements occur. The initial crystallinity can be measured at higher rates. It is shown, that such measurements can be performed in the DSC822<sup>e</sup> using sample robot and commercial available crucibles. A procedure is proposed for determination of the minimum heating rate at which the DSC curve is not influenced by re-crystallization.

Advantages of fast DMA are high sample throughput and the ability of using low sample sizes in mechanical analysis. Beside the fast measurements also a fast and comfortable sample preparation improves the throughput-rate of the instrument. For high heating rates also a high frequency is required to have enough data-points during transitions. The mechanical behavior of Poly(ethylene-terephthalate) from the glassy state into the melt was measured in approximately 15 min including sample preparation using a DMA/SDTA861<sup>e</sup>.