Differential Scanning Calorimeter
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Thermal analysis of PP

Chip-DSC 1

Introduction

Thermal analysis is a very useful tool for the analysis of various compounds. Differential Scanning Calorimetry (DSC) gives information about phase changes and chemical reactions.

The Chip-DSC is a powerful tool to identify and evaluate polymers like PP.

Information

Using a DSC for analysing materials is a common technique. In this application, the Chip-DSC was used for measurements of PP granules. Different batches could be identified by melting enthalpy and behavior.

PP, the short form for polypropylene, is one of the most common thermoplastic polymers. It consists of monomer propylene, belongs to the group of polyefins, and its properties are largely similar to those of polyethylene, but are slightly harder and more heat-resistant ($T_{M\_PE} \sim 100\,°C - 130\,°C$; $T_{M\_PP} \sim 150\,°C - 170\,°C$). It is often used for labeling and packaging, but also for piping systems. The melting point is the easiest way to characterize PP. The onset point differs between ~ 10 K for different manufacturers.

Table 1. Experimental Conditions

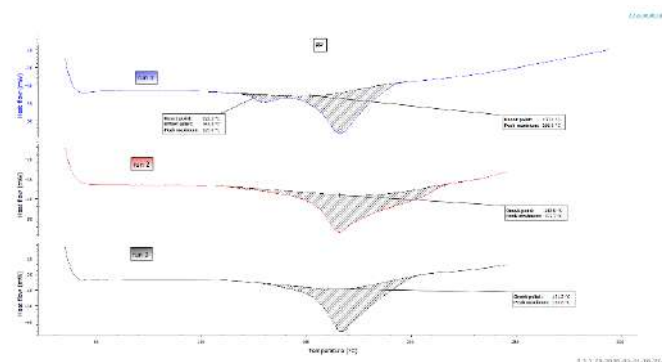| Instrument	Chip-DSC 1
Heating rate	25 K/minute
Sample Mass	approx. 30 mg
Sample Pan	open aluminum pans
Gas	Static air

Fig 1: PP; one sample; three runs