

APPLICATION SHEET

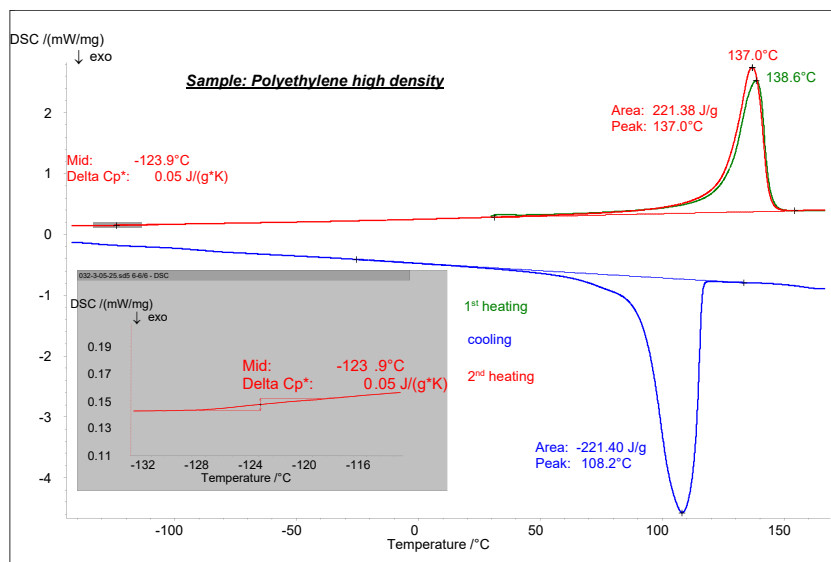
Polymers
DSC 3500 *Sirius*

Polyethylene High Density

Introduction

Polyethylene is a thermoplastic commodity heavily used in consumer products (over 60 M tons are produced worldwide every year). Polyethylene high density (HDPE) is defined by a density of greater or equal to 0.941 g/cm³.

HDPE has a low degree of branching and thus stronger intermolecular forces and tensile strengths. HDPE can be produced by chromium/silica, Ziegler-Natta or metallocene catalysts. The lack of branching is ensured by an appropriate choice of catalysts (e.g., chromium or Ziegler-Natta catalysts) and reaction conditions.



Test Conditions

Temperature range: 25 ... 180 ... -150 ... 180°C
Heating rate: 20 K/min
Atmosphere: Nitrogen (20 ml/min)
Sample mass: 10.36 mg
Crucible: Al, pierced lid

Test Results

The DSC curve of both heatings show a melting peak at 137 to 138.6°C. It is related to the crystallization peak at 108.2°C of the cooling (blue curve). In the 2nd heating (red curve), a glass transition was detected at -123.9°C (mid-point) with a change in heat capacity of only 0.05 J/(g·K).