

APPLICATION SHEET

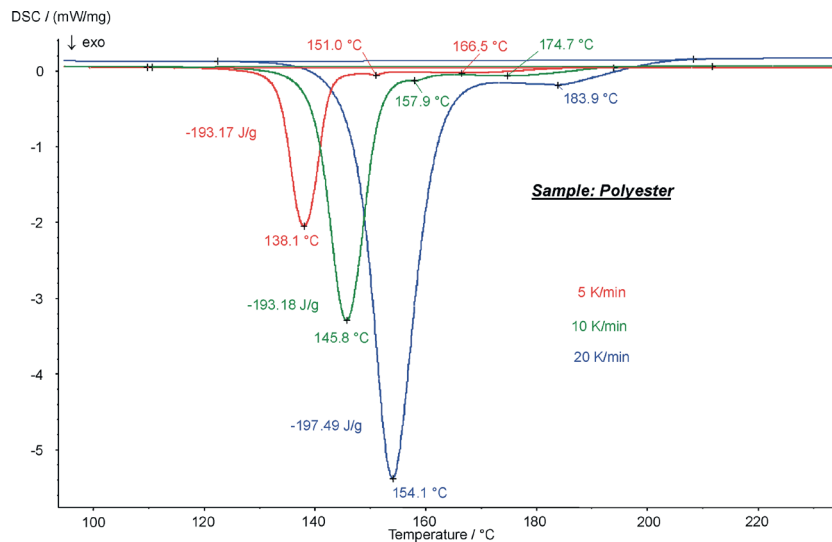
Polymers · Automotive
DSC 3500 Sirius

Unsaturated Polyester Resin

Introduction

Polyester is a category of polymers or, more specifically condensation polymers, which contain the ester functional group in their main chain. Linear unsaturated polyester

resins, simply called polyester resins, form the basis of traditional glass reinforced plastic products (sheet molding compounds). When they are cured, the unsaturated polyesters are often hard but brittle materials. It is used in wind-mills or covers in modern cars.



Test Conditions

Temperature range: 20 ... 250°C
Heating/cooling rates: 5, 10 and 20 K/min
Atmosphere: Nitrogen at 20 ml/min
Crucible: Al, closed
Sample mass: 10.48 mg (5 K/min)
10.68 mg (10 K/min)
9.75 mg (20 K/min)

Test Results

The exothermic effect between 120°C and 200°C with two or three peaks indicates curing of the sample. An initial large autocatalytic reaction is responsible for the peak at 138.1°C (measurement at 5 K/min), 145.8°C (measurement at 10 K/min) and 154.1°C (measurement at 20 K/min). Presented in figures 2 and 3 are the results of a thermokinetic analysis of the three tests. A three-step model A->B->C->D is used for the description of the reaction process. After optimization of the kinetic parameters, the kinetic software can be used to simulate the reaction for any (not measured) temperature profile.

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