

Differential Scanning Calorimetry

PerkinElmer, PYRIS Diamond



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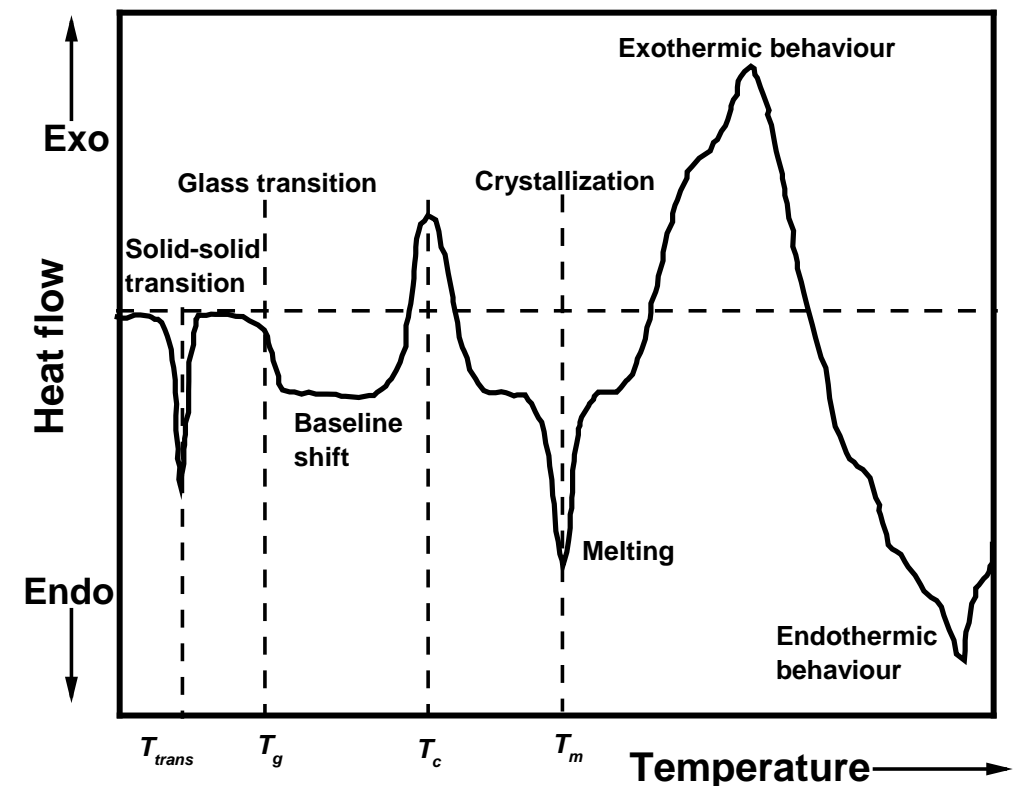
Introduction

Differential Scanning Calorimetry, or DSC, is a thermal analysis technique that looks at how a material's heat capacity (C_p) is changed by temperature.



Principle

DSC is a thermoanalytical technique that measures the difference in the amount of heat required to increase the temperature of a sample and reference as function of temperature. When a sample shows a transition its heat capacity changes and this is recorded as a change in the heat flow. During a thermal transition in the sample, the system will transfer heat to or from the sample to maintain the zero temperature difference between sample and reference this heat flow is recorded by the DSC. This heat flow allows the detection of transitions such as melting, glass transitions, phase changes and crosslinking.



Typical DSC transitions

Applications

The main applications are:

- Detection of phase transitions, such as melting, glass transition, or exothermic decomposition
- Study chemical reactions like oxidation
- Determining the reaction kinetics of a material
- Compositional analysis
- Effect of additives