

Differential Scanning Calorimeter (DSC)

Principle:

Differential scanning calorimetry is a thermoanalytical technique in which the difference in the amount of heat required to increase the temperature of a sample and reference is measured as a function of temperature.

DSC is used to measure chemical reaction such as thermal curing, heat history, specific heat capacity, purity analysis, glass transition determination, investigation of chemical reactions, melting, and crystallization behaviour. It is also used for drug analysis and in the agriculture sector. There are two measurement methods: Heat flux DSC, and Power compensation DSC.

Current model:

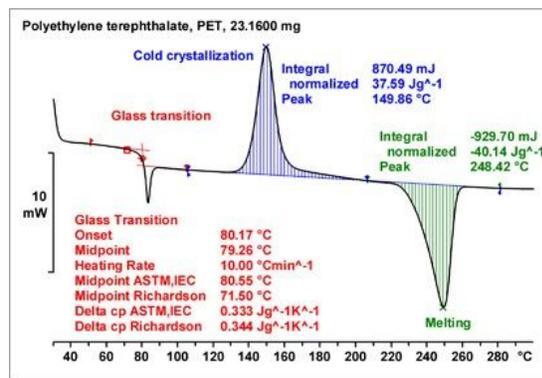


Figure: Differential scanning calorimeter (DSC)

DSC curve for PET

Video link: <https://www.youtube.com/watch?v=MRJXMEIpmjU>

DSC:

The DSC consists of a sample and reference holder, heat resistor, heat sink, and heater. Heat is applied into the sample and the reference through the heat sink and heat resistor.

Heat flow is proportional to the heat difference of the heat sink and the holders. The temperature difference between the sample and reference is kept constant. The temperature of the reference and sample are maintained at nearly the same temperature throughout the experiment. The reference sample should have a well-defined heat capacity over the range of temperatures to be scanned.

By calibrating the standard material, an unknown sample is measured quantitatively.



Instrument Description

Sub Folder: Thermal Analysis



Typical samples:

DSC is used to analyse polymers, liquid crystals, plastics, composites, laminates, adhesives, coatings, organic materials, rubber, pharmaceuticals, biological samples etc.

Standards:

Samples are assessed in accordance with the international standards such as: ASTM E 793-06, ASTM E1269-11, ASTM E 928-08, ASTM D3895, ASTM E 537-12, ASTM E 698-11 or as per customer requirements.

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