Polymer Chemistry - Differential Scanning Calorimetry

In a Differential Scanning Calorimeter (DSC) a sample and a reference (often a piece of Indium metal) are contained in small aluminum pans with crimped tops. The pans are placed on individual heaters in a furnace in a nitrogen atmosphere. A diagram of a heat flux DSC furnace is shown below.\(^\text{58}\)

![Diagram of a heat flux DSC furnace](https://eng.libretexts.org/Bookshelves/Materials_Science/Supplemental_Modules_(Materials_Science)/Polymer_Chemistry/Pol...)

The furnace is heated and the temperature difference between the sample and reference is monitored so that the DSC can keep the temperatures the same. If an exothermic phase transition occurs, the temperature of the sample will tend to surge ahead of the reference. In this case the DSC doesn't need to furnish as much heat to the sample. If an endothermic transition occurs, the DSC must furnish more heat to the sample. The electrical power difference between the sample and reference measures the heat flow (\(dQ/dt\)) in the sample.

Data are plotted as heat flow (\(dQ/dt\)) against temperature, giving a graph called a thermogram. An example thermogram is shown at the right.
Contributors and Attributions

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