

Better Material Characterization with StepScan DSC

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StepScan DSC is a modulated temperature DSC technique that operates in conjunction with power-compensation DSC. With *StepScan DSC* a new method for better material characterization of the thermal behaviour of materials such as T_g is introduced from PerkinElmer. This method uses the traditional approximation to measure the specific heat, C_p, for best possible accuracy of the results without experimental problems. StepScan DSC is possible only with the design of the power compensated Diamond DSC, with the very low mass oven for the sample and reference, and the resulting fast response.

The approach applies a series of short interval heating and isothermal hold steps to cover the temperature range of steps. This approach requires a DSC with very fast response to achieve short interval linear heating and isothermal steps.

The combination of short heating intervals over a small temperature range and small isothermal time intervals (for example 30 sec), will get the specific heat of the sample, this reflects the reversible part. The kinetic or the irreversible effect (in the time frame of the experiment) is eliminated in the *thermodynamic C_p* data set. If the glass transition, T_g, of the sample is overlaid from an enthalpy relaxation moisture release or crystallisation, the Thermodynamic C_p Signal shows the classical stepwise change of the specific heat, which is easy to analyse and interpret with StepScan. With the new StepScan DSC method it is possible to get the kinetic or *IsoK Baseline* data set, which gives the irreversible or slow process, during the experiment. The enthalpy relaxation, which will overlaid of the glass transition, T_g, of stressed samples will shown in the *IsoK Baseline*.

In this poster we will show some applications from the Pharmaceutical-, Automotive- and Polymer industry.