# Note

## A SIMPLE METHOD TO STRAIGHTEN THE BASE-LINE OF A PERKIN–ELMER DSC-1 APPARATUS

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Everyone carrying out calorimetric investigations on Perkin–Elmer DSC-1 units is well acquainted with the quite difficult problem of the base-line curvature, especially if related to quantitative research on polymers.

New types of DSC calorimeters involving more sophisticated equipment have solved the problem. However, a number of Perkin–Elmer DSC-1 instruments are still in operation and a simple procedure is offered here to overcome the problem.

The problem is associated with the "aging" of sample holders and the continuous increase of the base-line curvature in the upper temperature region. The curvature steadily increases with time in either endotherm or exotherm direction, depending on the individual characteristics of the holder in question.

Such a curved base-line can easily be straightened out, simply by placing more than one Al cover in the reference pan, using a plain trial-and-error method. A simple optimization is needed, for the use of too many covers could even result in a base-line curvature in the opposite direction.

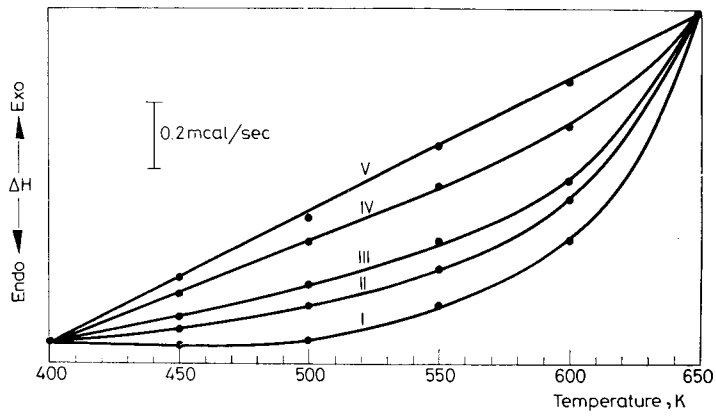


Fig. 1. Base lines of DSC curves

Figure 1 gives the curves of the DSC runs in the trial-and-error procedure needed to straighten out the base-line in the 400–650 K region of a PE DSC-1B unit with a seven-year-old holder, where:

I = Base-line obtained with 1 cover in the reference pan
II = Base-line obtained with 3 covers in the reference pan
III = Base-line obtained with 5 covers in the reference pan
IV = Base-line obtained with 7 covers in the reference pan
V = Base-line obtained with 10 covers in the reference pan

Conditions of DSC runs made during the procedure were as follows:

Heating rate – 8 deg/min
Range sensitivity – 1 mcal/sec
Chart speed – 20 mm/min
Recorder sensitivity – 10 mV

It is clearly seen that, with the holder used, one has to place 10 covers in the reference pan to obtain a good base-line.