Quantitatively measuring the resolutions of a DSC using n-hexatriacontane

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At the 11th ICTAC congress in Philadelphia, in the year 1996, the Dutch Society for Thermal Analysis and Calorimetry (TAWN) presented simple and practical tests for quantitatively measuring the resolution and sensitivity of DSC's [1]. Both tests make use of the substance 4,4'-azoxyanisole. Although the tests have been criticized (see *e.g.* [2)], they have been adopted widely.

However, since that time the performance of modern DSC instruments has improved significantly. While the sensitivity test is still very useable, the resolution test is not discriminative any more and needs to be replaced.

Marti *et al.* [3] published a paper on the resolution of DSC in which several substances were evaluated as test substances, of which n-hexatriacontane appears to be the most promising: the substance shows two transitions only 2 K apart.

We have further investigated the applicability of n-hexatriacontane for quantitatively measuring the resolution of a DSC instrument. Measurements were performed on several instruments using various sample masses and scan rates. Some interesting (thermal) characteristics of the substance will be discussed in this lecture.

It is concluded that n-hexatriacontane is very suitable for measuring the resolution of a modern DSC if a well-defined procedure is followed. A detailed protocol will be presented that we recommend for the measurement.

[1] P. J. van Ekeren, C. M. Holl, A. J. Witteveen, *J. Therm. Anal.* **49** (1997) 1105-1114.
[2] S. R. Aubuchon, P. A. Caulfield, R. L. Blaine,
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[3] E. Marti, E. Kaisersberger, W.-D. Emmerich, *J. Therm. Anal. Calor.* **77** (2004) 905-934.