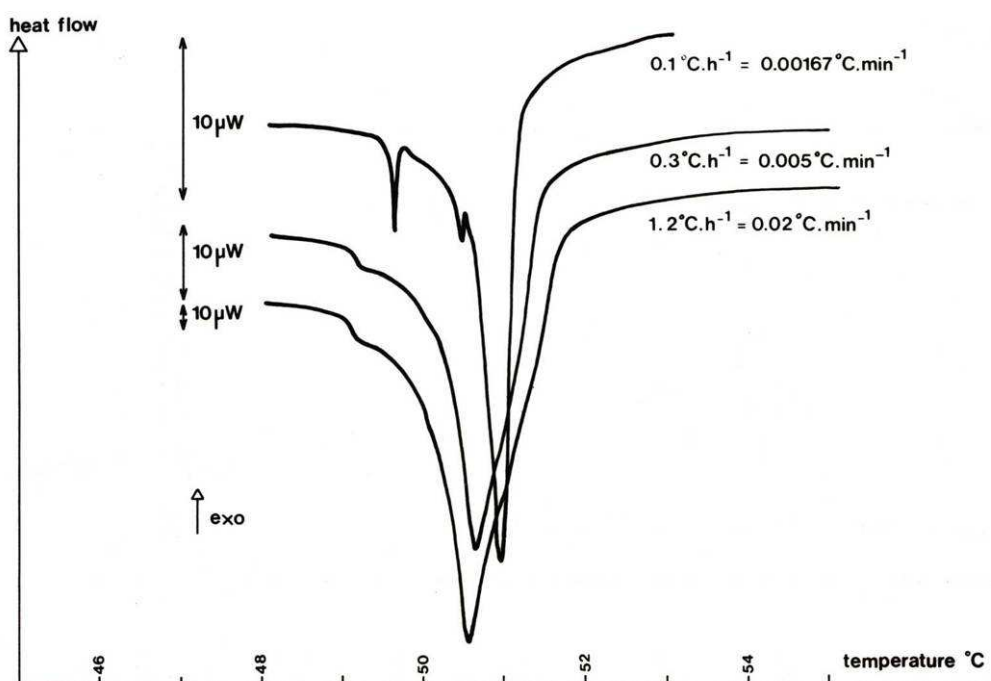


Phase transitions in a liquid crystal

Introduction

With a normal DSC, experiments are generally carried out at a high scanning rate ($5 \text{ K}\cdot\text{min}^{-1}$). In these conditions the determination of solid-mesophase or mesophase-isotropic liquid transitions can be performed easily. But as far as the mesophase-mesophase transitions analysis is concerned, much smaller scanning rates are required (a few $\text{K}\cdot\text{h}^{-1}$ or less). The main drawback is that in these conditions CONVENTIONAL DSC IS NOT SENSITIVE ENOUGH. For these reasons micro-DSC, A VERY SENSITIVE DSC IS OF GREAT INTEREST.

The capability of the micro-DSC of scanning the temperature upwards and downwards is also essential as it can provide information about the reversibility of the different transitions. This facility is especially important with the MONOTROPIC crystals which present mesophases only in the cooling mode.



Experimental

- Sample : Cholesteryl Oleate
- Mass : 532.4 mg
- Vessel : sealed vessel
- Scanning rate :
 - 0.1 $\text{K}\cdot\text{h}^{-1}$
 - 0.3 $\text{K}\cdot\text{h}^{-1}$
 - 1.2 $\text{K}\cdot\text{h}^{-1}$

Conclusion

The main peak corresponds to the transition : liquid crystal \rightarrow isotropic liquid.
When very slow scanning rates are used other peaks of mesophase \rightarrow mesophase transitions appear.

Micro DSC 3 Evo
Ambient to 120°C



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