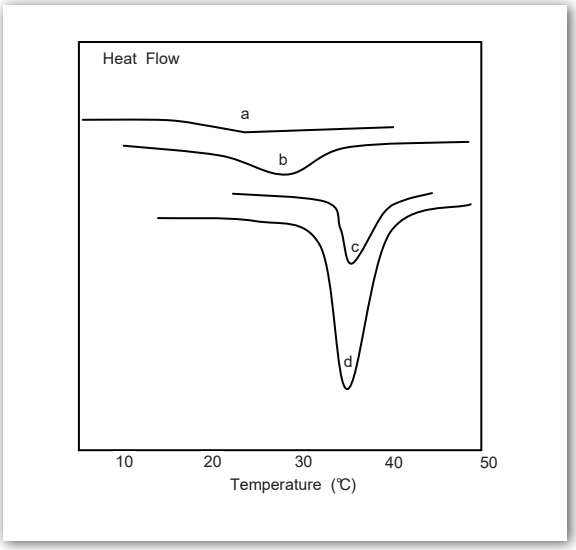
Transition behavior of hydrophobically modified N-isopropylacrylamide copolymer

INTRODUCTION

poly(N-isopropylacrylamide) (PNIPAAm) aqueous solutions presents a sharp transition around 32-34°C which is close to the body temperature. This characteristic has been exploited for the application in temperature sensitive nonviral vector for gene delivery.

Temperature induces a transition from coil to globule of copolymer backbone in solution, but the hydrophobic core of micelles is not affected. The author writes "…for PNI9.68VL1 solution, common DSC cannot provide calorimetry data with acceptable signal noise ratio. Herein, we employed µSC to track the subtle transition with high sensitivity."



EXPERIMENT

The following solutions have been analyzed :
(a) : PNI9.68VL1 (52.0 mg/ml)
(b) : PNI9.68VL1 (231 mg/ml)
(c) : PNIPAAm (52.0 mg/ml)
(d) : PNIPAAm (288.3 mg/ml)
Temperature was programmed from 5°C to 50°C at 1K/min.

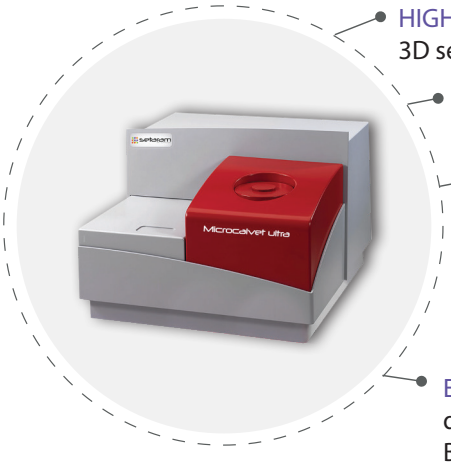
RESULTS AND CONCLUSION

The curves show endothermic peaks where the onset temperatures for both PNI9.68VL1 and PNIPAAm slightly decrease when the concentration is raised.
Explanation and interpretation are given in the article.

INSTRUMENT

MICROCALVET ULTRA

-20 to 170°C



HIGHEST HEAT MEASUREMENT ACCURACY
3D sensor based on Peltier elements with Joule effect calibration.

MODIFIABLE TEMPERATURE CONDITIONS
for increased flexibility and replication of real life conditions.

CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS
to perform even the most demanding experiments using one instrument :
- high pressure (1000bar) and high vacuum
- pressure measurement and control
- mixing experiment

EXTERNAL COUPLING CAPABILITY
designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels

For more details, ask for publication B1777

SETARAM is a registered trademark of KEP Technologies Group