

**EFFECT OF SYNTHESIS PARAMETERS ON THE PARTICLE SIZE AND SWELLING BEHAVIOUR OF pH-RESPONSIVE POLY(2-VINYLPYRIDINE)-BASED MICROGELS**

Damien Dupin, Syuji Fujii, Steven Armes

Department of Chemistry, Dainton Building, University of Sheffield, Brook Hill, S3 7HF Sheffield, United Kingdom

There are relatively few papers describing the synthesis of pH-responsive microgels and these have typically been prepared in relatively dilute solution (< 5 % solid).<sup>[1-3]</sup> In the present study we used emulsion polymerisation to produce poly(2-vinylpyridine) (P2VP) latexes, cross-linked by divinylbenzene, at 10 % solids using a commercially available poly(ethylene glycol) monomethacrylate [PEGMA; Mn = 2,000; Mw/Mn = 1.10] stabiliser and/or a cationic surfactant. A range of P2VP latexes from 370 to 970 nm were prepared simply by varying the amount of stabiliser, surfactant and initiator. The microgel properties of these P2VP latexes were studied using a range of characterization techniques (<sup>1</sup>H NMR, disc centrifuge photosedimentometry, dynamic light scattering, aqueous electrophoresis, x-ray photo-electron spectroscopy and scanning electron microscopy).

Also, stopped-flow experiments were carried out to determine the kinetics of swelling/deswelling of these microgels and to assess the effect of the particle diameter on the rate of response.

1. Loxley, A.; Vincent, B. *Colloid Polym. Sci.*, **1997**, 275, 1114.
2. Ma, G. H.; Fukutomi, T. *J. Appl. Polym. Sci.* **1991**, 43, 1451.
3. Saunders, B. R.; Crowther, H. M.; Vincent, B. *Macromolecules*, **1997**, 30, 482.