

Supercritical Fluids - New Solvents for Polymerisation

Steven M. Howdle^a, John N. Hay^b, Matthew R. Giles^a, Stephen J. O'Connor^a and Robert J. Winder^b

a) Chemistry Department, University of Nottingham, Nottingham, NG7 2RD
email: steve.howdle@nottingham.ac.uk

b) Chemistry Department, University of Surrey, Guildford, Surrey, GU2 5XH
email: j.hay@surrey.ac.uk

In recent years, there has been considerable interest in finding new and cleaner alternatives to conventional solvents. Supercritical fluids, in particular scCO₂ show great promise¹. In this paper, we describe the unique properties of supercritical fluids, and the equipment^{2,3} required for study of polymerisations in scCO₂.

Most polymers show little or no solubility in scCO₂, hence heterogeneous polymerisation methods are required. In this lecture we describe the development of stabilisers for free radical dispersion polymerisation of MMA in scCO₂. These stabilisers are macromonomer and graft type, and contain siloxane and fluorinated groups; species which are known to confer high solubility⁴ in scCO₂.

- 1 M. A. McHugh and V. J. Krukons, *Supercritical Fluid Extraction: Principles & Practice*; Butterworth, Boston, 1994
- 2 M. Poliakoff and S.M. Howdle *Chemistry In Britain* 1995, 31, 118-121.
- 3 M. Poliakoff, S.G. Kazarian and S.M. Howdle. *Angew Chem. Int. Ed.* 1995, 34, 1275.
- 4 K.A. Shaffer, T. A. Jones, D. A. Canelas, J. M. DeSimone and S. P. Wilkinson, *Macromolecules*, 1996, 29, 2704-2706.