

# The Characterisation of Porous Styrene/ Glycidyl Methacrylate Copolymer Beads Prepared by Suspension Polymerisation

P. J. Dowding, J. W. Goodwin and B. Vincent,  
School of Chemistry, University of Bristol, Cantock's Close, Bristol, BS8 1TS, UK.

*Abstract of intended Oral Presentation for 5<sup>th</sup> Meeting of UK Polymer Colloids Forum*

Cross-linked copolymer beads (typically  $> \sim 100\mu\text{m}$  diameter) are commonly used as separation media (e.g. as ion exchange resins and as supports for enzyme immobilisation). Such applications frequently require large particle surface areas, which necessitates the formation of pores (of the required dimensions) in the bead structure. Demand is steadily growing for the larger scale production of such beads with consistent quality and a size distribution as narrow as possible.

Porous, cross-linked polymer beads have been produced by suspension polymerisation. The effects of systematic changes in monomer ratio (styrene: glycidyl methacrylate) and initiator type used (benzoyl peroxide or AIBN) have been studied. Kinetic measurements have been performed, indicating that an increase in glycidyl methacrylate content leads to shorter reaction times. The use of AIBN as initiator also results in reduced reaction times (and higher yields).

The effects of such variations on both the emulsion and bead droplet size distributions and on average pore size have also been investigated. The specific surface areas of the polymer beads were also determined from BET isotherms. Variations in monomer ratio have been found to effect the bead formed. An increase in styrene reduces the average size of the emulsion droplets, but results in an increased final bead size. An overall increase in average pore size is also observed.