

The Preparation of Near-monodisperse Submicron-sized Polypyrrole-coated Particles

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In 1993 Wiersma et al. at DSM Research filed a European patent application¹ which described the synthesis of a dispersion of electrically conducting core-shell particles. These particles consist of three main components: a latex binder, a conducting polymer, and a non-ionic steric stabiliser. The DSM group used low T_g , film-forming latexes with the aim of producing electrically conductive films for anti-static/anti-corrosion applications. However, the polymer latexes utilised by DSM Research NBD, under the name Conquest, have relatively broad particle size distributions. At Sussex University we have recently shown that it is possible to coat near-monodisperse micron-sized polystyrene latexes with polypyrrole².

We have now synthesised and coated near-monodisperse submicron-sized polystyrene latexes with polypyrrole. The polypyrrole layer is believed to be both thin (1-2 nm) and uniform². Such particles are an ideal model system for the study of the more commercially relevant film-forming core-shell latexes. We have extensively characterised these core-shell particles using a variety of techniques, including: electron microscopy, disc centrifuge photosedimentometry, IR spectroscopy and electrical conductivity measurements. Surface composition and morphology studies using XPS and SANS are in progress.

1. Wiersma A. E., vd Steeg L. M. A., *Europ. Pat. No.* 589,529.
2. Lascelles, S. F., Armes, S. P., *Adv. Mater.*, vol. 7, 1995, 864.