

# SYNTHESIS AND SELECTIVE BETAINISATION OF TERTIARY AMINE METHACRYLATE BLOCK (CO)POLYMERS AND THEIR AQUEOUS SOLUTION PROPERTIES

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2-(dimethylamino)ethyl methacrylate (DMA) was block copolymerised *via* GTP with three related tertiary amine methacrylate monomers, 2-(N-morpholino)ethyl methacrylate (MEMA), 2-(diethylamino)ethyl methacrylate (DEA) and 2-(diisopropylamino)ethyl methacrylate (DPA)<sup>1</sup>. The DMA residues in the DMA-DEA<sup>2</sup>, DMA-DPA and DMA-MEMA block copolymers were selectively betainised with 1,3-propanesultone to yield novel polybetaines. The selectively betainised block copolymers exhibited pH-, salt-, and temperature-induced micellisation under various conditions. Betainisation significantly reduced the surface activities of the precursor block copolymers. The copolymer micelles were characterised by Photon Correlation Spectroscopy (PCS), UV spectroscopy and <sup>1</sup>H NMR spectroscopy. PCS indicated intensity-average micelle diameters of 15-40 nm. In some cases relatively monodisperse micelles were obtained. NMR studies confirmed that the betainised DMA block formed the solvated corona, with the more hydrophobic block (DEA, DPA or MEMA) forming the micelle core.

1. V. Bütün, N. C. Billingham and S. P. Armes, *Chem. Commun.*, 671, 1997.
2. V. Bütün, C. E. Bennett, M. Vamvakaki, A. B. Lowe, N. C. Billingham and S. P. Armes, *J Mater. Chem.*, 7(9), 1693, 1997.