

# Synthesis and Interfacial Activity of pH-Responsive Poly(2-vinylpyridine) Microgels

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## Abstract

A series of six near-monodisperse, sterically-stabilised poly(2-vinylpyridine) latexes ranging from 360 to 970 nm diameter are synthesised via aqueous emulsion polymerisation. The kinetics of the latex-to-microgel acid-induced swelling transition is studied using a stopped-flow pH jump technique: characteristic swelling times are of the order of tens of milliseconds and smaller particles swell faster than larger particles, as predicted by the Tanaka equation. Images of swollen microgels can be obtained directly in aqueous solution using x-ray microscopy. Adsorption of these particles at the mica/water and oil/water interfaces is investigated. Two different macromonomers are examined as steric stabilisers: a commercially available methoxy-capped poly(ethylene glycol) monomethacrylate and a tailor-made styrene-functionalised poly(2-dimethylamino)ethyl methacrylate). Steric stabiliser contents are estimated by proton NMR spectroscopy and x-ray photoelectron spectroscopy is used to confirm that both stabilisers are present at the particle surface, as expected. Judicious selection of the steric stabiliser allows the production of pH-responsive Pickering-type emulsions.

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