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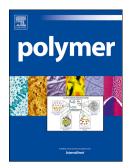
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Synthesis of Dual Stimuli-Responsive Amphiphilic Particles

through Controlled Semi-Batch Emulsion Polymerization

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Abstract

The synthesis and property of dual stimuli-responsive amphiphilic particle consisting

of a hydrophobic component, a pH-sensitive poly(ethyleneimine) (PEI) and a

temperature-sensitive poly(*N*-isopropyl acrylamide) (PNIPAm)

investigated. This novel type of multicomponent polymer (MCP) particles were

prepared through a one-pot controlled semi-batch emulsion polymerization which

involved an initial formation of PNIPAm/PEI core-shell nanogel particle via a graft

copolymerization of N-isopropyl acrylamide from PEI, followed by the seeded

emulsion polymerization of methyl methacrylate or styrene. Properties of these MCP

particles including particle composition, size, size distribution, surface charge and

morphology were systematically examined. The structure of hydrophobic monomer

was found to strongly influence the morphology of resultant MCP particles. The

multilayered polystyrene/PNIPAm/PEI particles exhibited unique property of

temperature-tunable surface charge. This property was demonstrated through studies

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