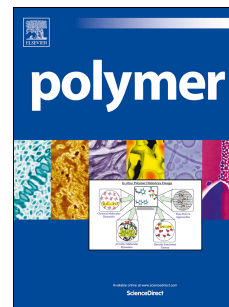


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# One-pot synthesis of non-spherical hollow latex polymeric particles via seeded emulsion polymerization

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## ABSTRACT

Non-spherical (ns) hollow latex (HL) particle with a void on one side of a polymer particle surrounded by a double-layered shell was fabricated via the one-pot seeded emulsion polymerization (SEP). Start from the ns seed formed by swelling styrene (St) or methyl methacrylate (MMA) mixed with azobisisobutyronitrile into a crosslinked spherical poly(styrene/divinyl benzene/acrylic acid) P(St/DVB/AA) particle and then polymerized. The ns seed particle having two lobes of crosslinked P(St/DVB/AA) and polystyrene (PS) protrusion obtained was then swelled with MMA/DVB/AA monomers (MMA:DVB = 1:2). After polymerization, the obtained ns HL particle with a single void on the PS side was generated without the seed removal. The key success factors are the locus of polymerization at the seed surface and the fast/efficient phase separation between PS seed and shell polymers. The double-layered shell composing of PS inner shell and P(DVB/MMA/AA) outer shell prevented the collapse of hollow structure. The ns HL particles (0.79  $\mu\text{m}$  in diameter and 1.04  $\mu\text{m}$  in over length) as a white pigment in the coating had a hiding power better than ns solid particles (ASTM D2803-96a, 2003).

*Keywords:* Hollow latex particle, Non-spherical particle, Non-spherical hollow particle, Seeded emulsion polymerization

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