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Article

## Waterborne star-shaped styrene-alkyd resins

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### ABSTRACT

Waterborne star-shaped styrene-alkyd resins (SSARs) were synthesized from a branched alkyd resin (AR) and styrene (St) by miniemulsion polymerization. SSARs are an environmentally friendly material. The ratio of AR to St for obtaining SSARs was as follows: 50:50 (SSAR1), 60:40 (SSAR2), 70:30 (SSAR3), and 80:20 (SSAR4). The conversion percentage was directly proportional to St used, and was higher than 94.0 %. Infrared analysis and protonic nuclear magnetic resonance revealed the reaction between AR and St. The synthesis process also leads to the formation of polystyrene and its concentration increases with the concentration of St. The values of the reacted double-bond fractions were higher than 17.80%. The SSARs drop size was bigger than the particle size. The miniemulsion colloidal stability was good at room temperature. The SSARs zeta potential was between  $-55$  and  $-90$  mV. © 2019 Wiley Periodicals, Inc. *J. Appl. Polym. Sci.* **2020**, *137*, 48386.

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