

Preparation of micron-sized styrene-butyl acrylate copolymer particles using a microreactor system

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To synthesize polymer particles heterogeneous polymerization such as emulsion, dispersion and suspension method can be used, especially for o/w or w/o system. Among these methods, suspension polymerization is particularly suited for the production of micron size polymer beads because of its simplicity. One of the most important and critical issues in suspension polymerization is the stability of emulsion system which is characterized by a constant behavior throughout the process and the uniform distribution of the dispersed phase in the continuous phase. It needs very strong agitation to reduce the emulsion drop size but it is still hard to get fine particles with desired surface morphology. One of the solutions is to adopt a microfluidic device to generate droplets of uniform size and shape. Recently, chemical processes using microreactors have received great interest because of their promising advantages such as effective heat transfer and precise residence time control. In this study, we prepared very stable emulsion solution using a capillary microfluidic device and carbon-black-encapsulated copolymer particles have been prepared using a microreactor system.