

Estimation method for prediction of agglomeration rate in emulsion polymerization

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Abstract

The aim of this study is to establish the method for prediction of the agglomeration rate of product particles in emulsion polymerization of polystyrene. The effect of shear rate on the agglomeration rate of product particle during the emulsification polymerization was established by conducting a preliminary experiment on emulsion polymerization in a vessel consisting of two coaxial cylinders. In addition to that, the CFD was conducted for a vessel equipped with MAXBLEND, which was used for the emulsion polymerization, and then the tracking particles were calculated. For the particles, the shear rates experienced were calculated and the agglomeration rate was estimated on the basis of the relation between agglomeration rate and shear rate established for the vessel of two coaxial cylinders. The sum of the agglomeration rate for all particles should correspond to that obtained experimentally for MAXBLEND. The results obtained were satisfactory.