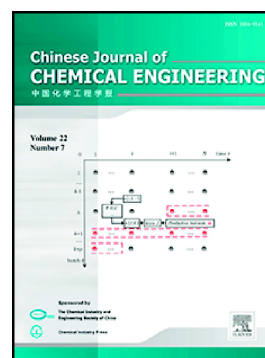


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Fluid Dynamics and Transport Phenomena

Critical impeller speeds for a gas-inducing stirring tank loaded with solid particles

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Abstracts: The influence of solid particles size, density and loading on the critical gas-inducing impeller speed was investigated in a gas-liquid-solid stirring tank equipped with a hollow Rushton impeller. Three types of solid particles: hollow glass beads with diameters of 300 μm , 200 μm , 100 μm , and 60 μm , silica gel and desalting resin were used. It was found that the adding solid particles would change the critical impeller speed. For hollow glass beads and silica gel, whose relative densities were less than or equal to 1.5, the critical impeller speeds increased with the solid loading before reaching the maximum values, and then decreased to a value even lower than that without added solids. The size of the solids also had apparent influence on the critical impeller speed, and larger solid particles correspond to a smaller critical impeller speed. The experimental data also showed that the gas-inducing was beneficial to the suspension of the solid particles.

Keywords: critical gas-induction impeller speed; gas-inducing impeller; gas-liquid-solid; multiphase reactor; solid loading

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