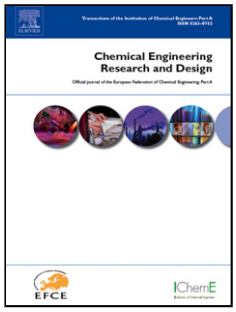

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Hydrodynamic Performance of the ASI Impeller in an Aerated Bioreactor Containing the Biopolymer Solution through Tomography and CFD

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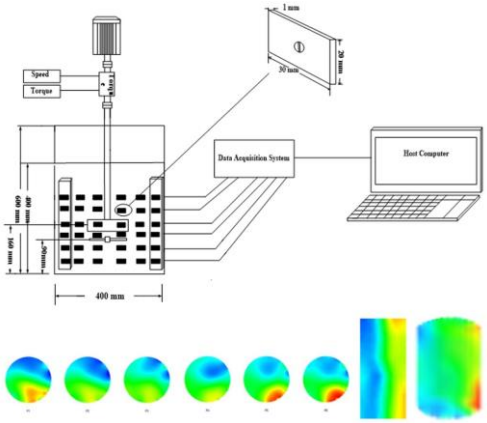
GRAPHICAL ABSTRACT



HIGHLIGHTS

- Performance of the ASI impeller was assessed for the gas dispersion in biopolymer solutions.
- The effects of gas flow rate, impeller speed, and fluid rheology on power and mixing time were explored.
- The CFD model was validated using the experimentally measured gas holdup and impeller torque.
- ASI impeller exhibited minimal effect of the gassing on power consumption compared to the Rushton.
- ASI impeller was more energy efficient compared to the pitched blade and Rushton impellers.

ABSTRACT

In this study, the performance of the ASI impeller, a new impeller designed in our research group, was assessed for the gas dispersion in the non-Newtonian fluids. The effects of volumetric