

3D Modelling of Flow Dynamics in Packed Beds of Low Aspect Ratio

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Abstract

This work used the 3D CFD modeling to investigate non-uniform deactivation in packed bed reactors of low aspect ratios under steady state and dynamic operations. In order to explore the effects of condition of instability on local deactivation, detailed knowledge of flow dynamics (i.e. local structure of the packed bed, pressure drops and interstitial flow in the void space), heat and mass rate distributions was examined. Simulation by 3D modeling included the formulation of 3D gas-solid model of fluid flow, mass and heat transfers, as well as the chemical reaction and the catalytic deactivation under steady-state and dynamic operations and comparison with relevant 2D pseudo-homogeneous models.

Reference

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