

Analysis and Simulation of Cross-Flow Reactor for Ethylene Epoxidation

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Abstract

A steady-state cross-flow reactor for ethylene epoxidation was simulated using industrial data (low oxygen/ethylene feed ratio) and pilot plant data (high oxygen/ethylene feed ratio). A comparison between the conventional fixed-bed reactor and the cross-flow reactor with two types of feeding modes was performed. The present study showed the possibility of enhancing the reactor yield by distributing the ethylene optimally at equal spaced along the reactor for both commercial and pilot plant cases. We have shown that the evenly distributed feeding mode does not increase the desired ethylene oxide yield. The model results confirmed that the cross-flow reactor with ethylene is the best configuration, followed by the conventional fixed-bed reactor and the cross-flow reactor with oxygen, respectively.

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