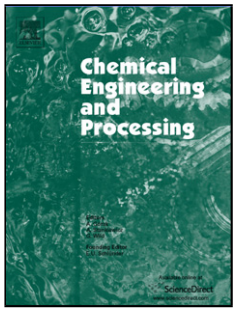

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Hydrodynamics and mass transfer performance of Flow-guided Jet Packing Tray

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Highlights

1. The FJPT consisting a variety of structures was designed.
2. The empirical formulas of pressure drop for the FJPT were established.
3. The hydrodynamics of FJTP was compared with that of New VST.
4. The effect of the size of cap bottom gap for the tray was studied.
5. The hydrodynamics and mass transfer perform for the tray was studied.

Abstract

A new flow-guided jet packing tray (FJPT) with high flux and efficiency has been designed in this paper. Hydrodynamics and mass transfer performance of FJPT, including tray pressure drop, weeping, entrainment, clear liquid height and tray efficiency, have been studied with cold-flow model experiments (using water, air and other system other simulation system for the test in the absence of chemical reaction conditions), using air-water-oxygen system in a 500 mm diameter plexiglass column. According to the experimental data，the empirical formulas of the FJPT have been established in terms of dry pressure drop and wet pressure drop． Compared with New Vertical Sieve Tray（New VST）, FJPT has lower pressure drop. The experimental result shows that dry plate pressure drop is independent of the size of the gap, while bigger cap bottom gap leads to lower wet plate pressure drop and weeping percent, smaller bottom gap leads to less entrainment and higher tray efficiency. These have provided a good theoretical basis for the research and development of the compound tray.