

عنوان مقاله:

CONCENTRATION AND TEMPERATURE DISTRIBUTION OF SIEVE TRAY DISTILLATION COLUMNS USING
CFD SIMULATIONS

محل انتشار:

دهمین کنگره ملی مهندسی شیمی ایران (سال: 1384)

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خلاصه مقاله:

A 3-D two-fluid CFD model was developed to predict the hydrodynamics, heat and mass transfer of sieve trays. The dispersed gas and the continuous liquid are modeled in the Eulerian framework as two interpenetrating phases. Interaction between the two phases occurs via interphase momentum, heat and mass transfer. The computational domain is considered to be the height between the trays. The tray geometries are based on the large rectangular tray of Dribika and Biddulph (AIChE. J., 32, 1864, 1986) and FRI commercialscale sieve tray of Yanagi and Sakata (Ind. Eng. Chem. Process. Des. Dev., 21, 712, 1982). In this work a CFD simulation is developed to give the predictions of the hydraulics and concentration and temperature distributions of distillation sieve trays including downcomer. The main objective has been to find the extent to which CFD can be used as a design and prediction tool for real behavior, concentration and temperature distributions of industrial trays. The simulation results are shown that CFD can be used as a powerful tool in tray design and analysis, and can be considered as a new approach for efficiency calculations.

کلمات کلیدی:

Computational Fluid Dynamics, Distillation Column, Sieve Tray, Concentration distribution, Temperature distribution, Heat Transfer, Mass Transfer

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