عنوان مقاله:

Mathematical Modeling of Plug flow and Axial Dispersion Models in a Sieve-plate Extraction Column

محل انتشار:

سومین کنفرانس بین المللی علوم و مهندسی (سال: 1395)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Pouria Amani - *Department of Chemical Engineering, University of Tehran, Tehran, Iran*

Mohammad Esmaeili - *Department of Chemical Engineering, University of Tehran, Tehran, Iran*

خلاصه مقاله:

Modeling of a counter-current Sieve-plate liquid–liquid extractor has been conducted using plug flow (PF) model and axial dispersion (AD) model. Several experiments were done using toluene/ acetic acid/ water system with acetic acid as mass transfer agent from aqueous to organic phase. New analytical solutions are proposed for two models respectively and the simulation results show a good agreement, compared with experimental data. In this paper, the solute concentration profiles in both disperse and continuous phases based on plug flow model as well as axial dispersion model and experimental values. The average deviation 12.47 and 7.26 percent between the experimental data and the simulation outcomes of the disperse and continuous phases composition in steady state condition were obtained for the models, respectively. Moreover, when the influence of dispersion in continues phase was included in the AD model, the simulation results greatly improved. Therefore, the results showed that the effect of dispersion in continuous phase can not be neglected in the mathematical modeling of these columns

کلمات کلیدی:

Differential model, Plug flow model, Axial dispersion model, Sieve-plate column

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/491705