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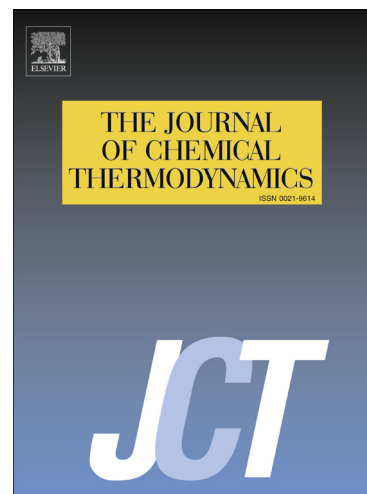
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Liquid-liquid equilibria for the ternary system of water + furfural + solvents at 303.15 and 323.15 K under atmospheric pressure

Peng Cui, Hai Liu, Kun Xin, Houchun Yan, Qing Xia, Yunjing Huang, Qingsong Li*

(State Key Lab of Heavy Oil Processing, China University of Petroleum (East China),

Qingdao, Shandong 266580)

Abstract

Liquid-liquid equilibria data are investigated for the furfural-water system with o-xylene, m-xylene and also ethylbenzene as extractants at 303.15 and 323.15 K. The distribution coefficient and separation factors were calculated according to the LLE data. All the separation factors were much larger than one, implying the feasibility of these three solvents to extract the furfural from aqueous solution. To facilitate the manipulation of the obtained data for industrial applications, the NRTL and the UNIQUAC models have been applied to correlate the experimental data and all the root mean square deviation (RMSD) values of the two models were less 0.20. All the data demonstrated that o-xylene, m-xylene as well as ethylbenzene were ideal extractants for separating furfural from aqueous solution.

Key words:

Liquid-liquid equilibria; furfural; water; xylene; NRTL; UNIQUAC

List of symbols

A, B	Othmer-Tobias equation constant
m, n	Bachman equation constant
R^2	Othmer-Tobias and Bachman correlation coefficients
g, u	interaction parameters
D	the distribution coefficient
S	the separation factor
M	number of tie lines
OF	objective function
RMSD	root mean square deviation
r	volume parameter in UNIQUAC equation

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