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Francisco Carlos Paes, Luis R.S. Kanda, Fernando A.P. Voll, Marcos L. Corazza

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**Liquid-liquid equilibrium of ternary systems comprising ethyl
valerate(1), water(2), ethanol(3) and valeric acid(4)**

Francisco Carlos Paes¹, Luis R. S. Kanda¹, Fernando A. P. Voll¹, Marcos L. Corazza^{1*}

¹Department of Chemical Engineering, Federal University of Paraná (UFPR), Curitiba
82530-990, PR, Brazil.

* Corresponding author. Tel.: +55 41 3361 3587.

E-mail address: corazza@ufpr.br (M.L. Corazza)

Abstract

Valeric biofuels stand for a promising energy source, since they are generated from the refining process of crop residues, which converts lignocellulose into the valeric biofuel (or valeric ester). In order to achieve a high grade valeric ester, several washing steps are required and eventually results in the formation of two liquid phases (water-rich and ester-rich phases). In this context, the objective of this study is the experimental determination of liquid-liquid equilibrium (LLE) concerning chemical species present during the ethyl esterification of valeric acid (valeric acid, ethanol, ethyl valerate and water). Results were obtained for the LLE of ternary systems comprised of binodal curves and tie-lines at atmospheric pressure (91.1 kPa) and 293.15 K and 318.15 K. The experimental values obtained were modelled using NRTL, UNIQUAC and UNIFAC-LL Gibbs energy models. Both NRTL and UNIQUAC models were able to correlate

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