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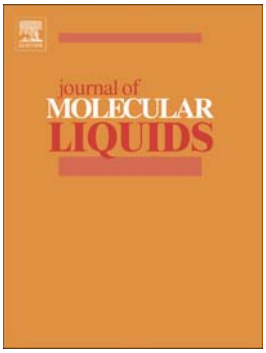

Salt effect on the liquid-liquid equilibrium of (water + diethanolamine + isobutanol/cyclohexanol) systems at T = (298.2 and 308.2) K

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PII: S0167-7322(16)30425-1
DOI: doi: 10.1016/j.molliq.2016.07.084
Reference: MOLLIQ 6098

To appear in: *Journal of Molecular Liquids*

Received date: 20 February 2016
Revised date: 15 July 2016
Accepted date: 18 July 2016

Please cite this article as: Bahram Ghalami-Choobar, Mostafa Fazli, Fateme HasannezhadSabersalimi, Salt effect on the liquid-liquid equilibrium of (water + diethanolamine + isobutanol/cyclohexanol) systems at T = (298.2 and 308.2) K, *Journal of Molecular Liquids* (2016), doi: 10.1016/j.molliq.2016.07.084

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ACCEPTED MANUSCRIPT

Salt Effect on the Liquid - Liquid Equilibrium of (Water + Diethanolamine+ Isobutanol/Cyclohexanol) Systems at T= (298.2 and 308.2) K

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AbstractIn this work, salt effect on the liquid phase equilibrium of (water + diethanolamine + isobutanol) and (water+ diethanolamine + cyclohexanol)systems was investigated at T= (298.2 and 308.2) K. The liquid-liquid equilibrium data in the presence of KCl and NaCl salts for various ionic strength of 0.5, 1.0, 1.5, and 2.0 mol·dm^{-3}and in absence of these saltswere determined. The experimental results were correlated based on the Othmer-Tobiasequation, Bachman equation and Pitzer ion-interaction model. Thermodynamic properties such as distribution coefficients and activity coefficients of diethanolamine in water + isobutanol andwater + cyclohexanol mixtures were determined. In addition, the separation factor of the chosen solventswere obtained for the investigated systems.

Keywordsliquid-liquid equilibrium, salt effect, diethanolamine, distribution coefficient, activity coefficient

1 INTRODUCTION

Diethanolamine (DEA) is one of the important amine that is used as a surfactant, a corrosion inhibitor,as solvents for numerous drugs and dishwashing detergents [1, 2]. It is also employed to remove hydrogen sulfide and carbon dioxide from natural gas, metal working fluid sand as industrial and agricultural chemicals [2-4].In addition, DEA is used in the production of diethanolamides, which are common ingredients in cosmetics and shampoos added to confer

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