VLE Prediction using Activity Coefficients for Binary Systems

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Abstract

Distillation operations are inevitable in many chemical industries and all the petroleumindustries. The vapor liquid equilibrium data are very much essential in design of distillation columns. Generation of the VLE data using experimental methods are quite expensive and timeconsuming due to the enormous number of experimental runs needed. Theoretical means ofestimating the VLE for non ideal mixtures using activity coefficient models has been afascinating research area in the field of fluid phase equilibria. In the present work, a new two parameter activity coefficient model (TPACM) has been framed to obtain the VLE for three binary systems, namely Chloroform - Benzene, Carbontetrachloride - Cyclohexane, Carbontetrachloride - Ethanol. The VLE computed from TPACM for these systems (isothermaland isobaric) were validated using the experimental VLE from literature and Redlich –Kisterthermodynamic consistency test. The parameters for the systems are reported along with theerror analysis.

Keywords: VLE, Activity coefficient, Thermodynamic consistency, TPACM, JAVA

A Comparative study of performance of various types of constructed wetlands for automobile wash water treatment

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Abstract

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The current situations of enhanced water pollution and the upcoming thrive for waterusage has led to the need for more economical, scientific and effective strategies ofwater treatment. The notions of current researches indicate the effectiveness ofconstructed wetlands that precedes the natural and artificial water treatment methods.

Constructed wetlands classified under free water surface flow, sub-surface flow,horizontal sub-surface flow, vertical sub-surface flow etc. can be used efficiently for thetreatment of oil produced water and effluents of petroleum industry. Studies prove thatdifferent classes of constructed wetlands can be used effectively for the treatment ofautomobile wash water as well.

This study focuses on various constructed wetlands for the treatment of automobilewash water by comparing the results obtained from different studies reported in theliterature in terms of physiochemical parameters. The reduction in physiochemicalparameters from various literatures is juxtaposed and the conjectures are stated asgraphs and analytical tools providing a distinct representation of the efficiency ofconstructed wetland systems and other treatment frameworks.

Keywords: Constructed wetlands; Physiochemical parameters; Natural treatment methods; Artificial water treatment methods