Environmental Engineering and Management Journal

January 2010, Vol. 9, No.4, 483-487
http://omicron.ch.tuiasi.ro/EEMJ/

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ARTIFICIAL NEURAL NETWORK FOR PREDICTION OF EXCESS REFRACTIVE INDICES OF SOME BINARY MIXTURES

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Abstract

N-propanol and toluene are frequently used as organic solvents in paints, varnishes, lacquers, glues, fuels, antifreeze, degreasing, cleaning agents, inks, pharmaceutical products, and laboratory processes. In spite of their wide usage, these solvents are considerably toxic and prolong exposure has an increase risk for cancer. Some alternatives for the use of solvents are available - for instance water based emulsions. Distillation, the most widespread technique for separating liquid mixtures, is in particular the chief separation method used in the petroleum and chemical industries. Experimental measurements of refractive indices and other property (density, surface tension, etc.) for binary mixtures have gained much importance in many chemical industries and engineering disciplines. From the values of the measured refractive indices, the excess refractive indices (n_{exc}), of the mixed solvents were calculated. In this work, a simple neural network models and modular neural network for prediction excess refractive indices were developed. Good results are obtained both in training and validation phases, emphasizing the generalization capabilities of the neural models.

Key words: artificial neural networks, excess refractive indices, mixtures

Received: July, 2009; *Revised:* February, 2010; *Accepted:* March 2010

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