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Mehdi Sattari, Babatunde F. Bakare



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A Novel Method for Developing a Corresponding States Model for the Prediction of Liquid Surface Tension of Gases

Mehdi Sattari,^{a,*}, Babatunde F. Bakare,^a

^a Faculty of Engineering, Department of Chemical Engineering, Mangosuthu University of Technology, P.O. Box 12363 Jacobs, Durban, 4026, South Africa

Abstract – The surface tension of chemical compounds controls some of the important processes in chemical engineering. On the other hand, surface tension is recognized as one of the most difficult thermo-physical properties to correlate or predict. In this paper, it was shown how to use a novel combination of the group contribution method and a mathematical-based algorithm to develop a predictive model. In this study, Gene Expression Programming (GEP) was used and the performance of the model developed was measured. Additionally, a comparison study was performed between newly developed corresponding states model and the previously published correlations available in the literature. Accordingly, it was demonstrated that there was a good agreement between predictions using the model proposed and the literature-reported data for surface tension. The results indicated that the model proposed was more reliable than the available correlations for determination of the surface tension of liquid gases, from an error analysis point of view.

Keywords: *Surface Tension; Gas; Gene Expression Programming; GEP; Group Contribution; GC; Model*

* Corresponding authors: Email: sattari.mehdi@mut.ac.za / mehdi.sattari@gmail.com

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