148x An Eos-Based Viscosity Model for Polymer-Solvent Mixtures

Edmundo Etchechury-Alvarez and Ricardo Macias-Salinas

A mathematical model was developed for the representation of experimental viscosities of liquid mixtures comprising a polymer-solvent solution over a wide range of temperature and composition. The resulting viscosity model is based on the Eyring theory and a cubic equation of state CEoS (Soave o Peng-Robinson) coupled with an expression for the excess Gibbs free energy G-ex suitable for polymer-solvent solutions (Flory-Huggins model). The connection between the CEoS and the G-ex model was made possible via the use of mixing rules of the Wong-Sandler type. The results obtained in this work were highly encouraging and satisfactory during the representation of experimental viscosities for two different polymer-solvent mixtures (polyethylenglycol/1,4-dioxane and polyethylenglycol/oxane) within the whole range of compositions and at different temperatures and molecular weights of the polymeric specie.