

Modified Fogel-Fulcher-Tamman viscosity equation for mixtures of monoethylene glycol – diethylene glycol – triethylene glycol taking into consideration their composition

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Abstract

To know physicochemical and thermal properties of pure polyethylene glycols and their mixtures is necessary for accurate technological calculations. Relationships obtained by simplex lattice method with the help of computer simulation (changing component concentration, temperature and pressure) make it possible to get optimal conditions for process technology meeting the requirements of output parameters.

Simplex lattice design has the advantage in predicting a property of a mixture with arbitrary composition if the experimental results for pure materials, their binary and one ternary mixtures were obtained (as in our case).

A relationship is developed on the basis of Fogel-Fulcher-Tamman equation with coefficients depending on pressure which can be used for representing viscosity-temperature dependence of mixtures of MEG, DEG and TEG with the help of simplex lattice method in a wide range of temperatures, pressures and concentrations.

This relationship is used for viscosity calculation of mixtures of monoethylene glycol – diethylene glycol – triethylene glycol taking into consideration their composition in the temperature range from 298 to 473 K and pressures up to 245 Pa.