Surface Tension and Density of Kinetic Inhibitors Near the Hydrate Formation Region of Tetrahydrofuran

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In order to understand the physicochemical behaviour of low-dose kinetic hydrate inhibitors we have determined the equilibrium vapor/liquid surface tension of the ternary system composed of poly(vinylpyrrolidone) having a molecular weight of 60 000 (PVP-K30) + tetrahydrofuran (THF) + water (1 mol THF:17 mol of water), at 278.15, 283.15, 293.15, and 298.15 K, at four different concentrations of the PVP-K30, and aqueous solutions composed of vinylcaprolactam/vinylpyrrolidone/dimethylaminoethyl metacrylate copolymer (Advantage S), at 278.15, 283.15, 293.15, and 298.15 K, at four different concentrations of the Advantage S, and PVP-K30 , at 298.15 K and twelve different concentrations of PVP-K30. The measurements of surface tension were made employing the pendant drop method. The surface tension results for the studied systems decrease with the increase of temperature and concentration of the hydrate inhibitors. Furthermore, since density is a property employed to determine of surface tension it has been studied with a vibrating-tube densimeter for the same systems as above and at the same concentrations and temperature range as in the surface tension study. These properties are useful to understand the formation of hydrates in different systems of both scientific and industrial interest.