# Comparison of the Surface Tension of Aqueous Binaries with Methanol, Ethanol, and Ethylene Glycol in the Low Temperature Region Including Supercooled State

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We report new experimental data for the surface tension of binary aqueous systems with three different alcohols. The temperature and composition dependencies of surface tension of aqueous mixtures with methanol, ethanol, and ethylene glycol are presented. The data were collected using an in-house developed apparatus allowing measurements under the metastable supercooled state, i.e. at temperatures under the equilibrium freezing point. The experimental technique is based on the modified capillary rise method with height compensation using helium counterpressure [1,2]. The low-temperature capillary rise data are compared with du Noüy ring and Wilhelmy plate measurements carried out with the commercial tensiometer Krüss K 100 under stable temperatures close to ambient. In addition, the liquid density of selected binaries was measured using the vibrating tube densimeter [3] over the full composition range at temperatures from 2 to 90 °C. New density data together with the available literature data were employed for the development of density correlations at 0.1 MPa with reasonable extrapolation behavior into the metastable supercooled region. The standard uncertainties of the reported surface tension and density data are below 0.50 $mN \cdot m^{-1}$ and 0.040 $kg \cdot m^{-3}$, respectively.

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**Selected references**

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