

## Current Status of Correlations for the Surface Tension of Ordinary Water

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The international standard for the surface tension of ordinary water approved by IAPWS [1] is based on the correlation by Vargaftik et al. [2] introduced in 1983. The IAPWS standard has been later adjusted to the International Temperature Scale of 1990 (ITS-90) and, based on new experiments carried out under the metastable supercooled state, has been proved to provide reliable predictions even when extrapolated from 0 °C down to -25 °C. Even though the IAPWS standard provides reliable predictions, it seems to suffer from three weaknesses: A) the uncertainty estimates appear rather high, e.g., 0.36 mN/m at 25 °C; B) in the high-temperature region reaching the critical point, the correlation is based on just two data sets published back in 1969 and 1973 by a single research group of Vargaftik [3]; C) recent experiments carried out at temperatures down to -31 °C show slight deviation from the extrapolated IAPWS standard [4]. In 2016, the group of Pátek reported new experimental data from -0.6 to 70 °C and developed a new correlation for the surface tension of ordinary water [5] with an estimated error of 0.1 mN/m. The mathematical formula is identical with the IAPWS standard. In 2015, Kalová and Mareš reviewed literature data for surface tension at 20 and 25 °C [6] and recently developed another correlation for the surface tension of ordinary water with an additional term  $\tau^{1.76}$  [7]. The uncertainty is estimated between 0.1 and 0.2 mN/m depending on the temperature region. In this talk, we compare the available correlations and try to assess recent developments that could lead to a possible reduction in the uncertainty estimates of the current IAPWS standard for the surface tension of ordinary water.

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