

High Pressure Volumetric Properties and Speed of Sound of HFE 7300

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Hydrofluoroethers (HFEs) are a class of fluids synthesized since the '90s. The variety of HFEs synthesized offer a wide useful temperature ranges, a relatively high thermal capacity, low viscosity and high liquid density, being also non-flammable, inert to common metals and polymers, and exhibiting very low overall toxicity [1]. Also, these kinds of compounds have zero or near-zero ozone depletion potential and low global warming potential. HFE 7300, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-pentane, is an hydrofluoroether which can be used in heat transfer applications, cleaning applications, and in lubricant deposition. This work provides experimental density data for pure HFE-7300 in the pressure range (0.1 – 140) MPa and in the temperature interval (293.15 – 393.15) K. Correlation of data was performed by using a Tait-like equation, and also the derived properties, that is, the isothermal compressibility and the isobaric expansion were calculated. Speed of sound was measured at 0.1 MPa and at temperatures (293.15 – 333.15) K. Isentropic compressibility was determined in the same temperature range.

Acknowledgements: N. Muñoz-Rujas acknowledges support for this research to the Universidad de Burgos, for the funding of her doctoral grant. This work is part of the doctoral Thesis on N. Muñoz-Rujas.

References:

[1] 3MTM Novec™ Engineered Fluids. https://www.3m.com/3M/en_US/company-us/all-3m-products/~ /3M-Novec-7300-Engineered-Fluid?N=5002385+3294002005&rt=rud (last accessed 10/11/2017).