

Density and Speed of Sound for the Binary System HFE 7500 + Di-Isopropyl Ether

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Hydrofluoroether fluids (HFEs) are being used as third generation alternatives to replace CFCs (chlorofluorocarbons), HCFCs (hydrochlorofluorocarbons) and PFCs (perfluorocarbons) because of their nearly zero ozone depletion, relatively low global warming potential and short atmospheric lifetimes [1]. A variety of HFEs have been synthesized, their performance and environmental properties and hence their utility can vary widely [2]. 2-trifluoromethyl-3-ethoxydodecafluorohexane, known as HFE 7500, is a nonflammable fluid with very low global warming potential for use in heat transfer applications. In addition, it may be industrially used to cool high voltage transformers and power electronics, to cool semiconductor thermal shock and test equipment and as an alternative to commonly used fluids in pharmaceutical and chemical manufacturing processes, such as freeze drying and reactor cooling. To some extent, it can be used in mixture with other solvents. Experimental densities and speeds of sound for the binary system HFE 7100 + di-isopropyl ether have been measured at 298.15 K and at atmospheric pressure. The excess molar volumes and the deviations in isentropic compressibility upon mixing have been correlated by the Redlich-Kister polynomial. No data were found in the literature for this binary mixture. Acknowledgements: N. Muñoz acknowledges support for this research to the University of Burgos, for the funding of her doctoral grant. This work is part of the Doctoral Thesis of N. Muñoz.

References

- [1] W. Tsai, J. Hazard. Mater. A, 2005, 119, 69–78. [2] 3M™ Novec™ Engineered Fluids, http://solutions.3m.com/wps/portal/3M/en_US/3MNovec/Home/ (last visit 21/11/2014)