

Excess Properties of Binary Mixtures of *N*-Methyl-2-piperidinone with Water or Water- d_2

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This work is fifth part of our systematic study on the excess properties of binary mixtures of various dipolar aprotic amides with H₂O or D₂O[1-4]. Dipolar aprotic compounds as the organic component in binary aqueous mixtures are interesting for example because of their solvent effect on rates of reactions. Many of them are also versatile solvents in various industrial processes. Excess properties of binary mixtures of H₂O with various amides have been reported in the literature quite extensively. However, studies on the properties of corresponding systems containing D₂O instead of H₂O are scarce. Our previous work deals with binary mixtures of H₂O or D₂O with *N,N*-dimethylformamide (DMF) [1], *N,N*-dimethylacetamide (DMA) [2], *N*-methyl-2-pyrrolidinone (NMP) [3], and *N*-methyl- ϵ -caprolactam (NMC) [4]. In the present work the amide is *N*-methyl-2-piperidinone (NMPi). As far as we know, no information about the excess properties of binary mixtures of NMPi with H₂O or D₂O is available in the literature. Densities of binary mixtures of NMPi with H₂O or D₂O were measured over the entire mole fraction range at temperatures from 278.15 K to 323.15 K. Speed of sound was measured in the same mixtures at the same temperatures. A DSA 5000 Density and Sound Velocity Analyzer (Anton Paar) was used in the measurements. Viscosities of mixtures were measured at temperatures from 288.15 K to 323.15 K. An AMVn Automated Microviscometer (Anton Paar) was used in these measurements. The excess properties calculated from the measurements will be discussed.

- [1] P. Scharlin; K. Steinby, and U. Domańska, *J. Chem. Thermodynamics*, **34**, 927 (2002).
- [2] P. Scharlin and K. Steinby, *J. Chem. Thermodynamics*, **35**, 279 (2003).
- [3] P. Scharlin, T. Ruohomaa, and K. Steinby, *ICSC-2003*, Debrecen, Hungary, *Book of Abstracts*, 165 (2003).
- [4] P. Jarvela, K. Steinby, and P. Scharlin, *IUPAC ICCT-2004*, Beijing, China, *Book of Abstracts*, 64 (2004).