

Abstract Submitted
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Heat Capacity of Liquid Poly(vinyl methyl ether) With and Without Water¹ MAREK PYDA, Department of Chemistry, The University of Technology, Rzeszow, 35959 Rzeszow, Poland, B. WUNDERLICH, Dept. of Chemistry, The Univ. of Tenn., and Chemical Sciences Div., ORNL, K. VAN DURME, B. VAN MELE, Dept. of Physical Chem. and Polymer Science, Vrije Universiteit, Belgium — The liquid heat capacities at constant pressure C_p , of amorphous poly(vinyl methyl ether), PVME, without and with water have been computed as the sum of vibrational, external, and conformational contributions. The vibrational contribution was calculated from the heat capacity arising from group and skeletal vibrations. The external contribution was estimated from experimental data of the thermal expansivity and compressibility in the liquid state. The conformational heat capacity was evaluated from a fit of experimental part to a one-dimensional Ising model for two discrete states, characterized by parameters linked to stiffness, cooperativity, and degeneracy. For the PVME-water system the additional changes in the conformational heat capacity arising from the interaction of the PVME chains with water. The experimental liquid C_p agrees with these calculations to better than 3%. The calculated liquid C_p was employed in the interpretation of the thermal analysis of the apparent C_p in the region of the melting, demixing, remixing, and crystallization within the PVME-water system.

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