

Abstract Submitted  
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**Heat Capacity of Poly(vinylmethylether) in the Presence and Absence of Water** M. PYDA, Department of Chemistry, The University of Tennessee and Chemical Sciences Division, ORNL, Oak Ridge, K. VAN DURME, Department of Physical Chemistry and Polymer Science, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium, B. WUNDERLICH, Department of Chemistry, The University of Tennessee and Chemical Sciences Division, ORNL, Oak Ridge, B. VAN MELE, Department of Physical Chemistry and Polymer Science, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium — Heat capacity,  $C_p$ , of poly(vinylmethylether), PVME, without and with water has been measured from 5-375 K, using adiabatic and differential scanning calorimetry. The PVME has a glass transition at 248 K. At lower temperatures,  $C_p$  of the solid is linked to group and skeletal vibrations. The skeletal vibrations are described by a Tarasov equation with three characteristic temperatures. The experimental  $C_p$  agrees to better than  $\pm 3\%$ . The  $C_p$  of the liquid is  $72.36 + 0.136 T$  [J/(K mol)] and compares well with results estimated from constituent groups of other polymers using the ATHAS Data Bank. The calculated solid and liquid  $C_p$  was used as baseline for the analysis of amorphous PVME with different thermal history, to follow the crystallization, melting, mixing, and demixing within the PVME-water system. Also, knowing  $C_p$  of the solid and liquid, the enthalpy, entropy, and Gibbs function of glassy and liquid PVME was calculated..

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