

# Measurements of the Isobaric Specific Heat Capacity for Aqueous Methanol Mixtures and Aqueous Ammonia Mixtures at High Pressures

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We have been measuring the isobaric specific heat capacity for fluids and fluid mixtures by the thermal relaxation method at high pressures. The calorimeter used was designed to satisfy the requirements for the lumped system analysis. Nitrogen gas filled between the calorimeter and the pressure vessel has functions of adiabatic and pressure media. The pressure vessel is immersed in a thermostatted oil bath whose temperature is kept constant within  $\pm 5$  mK. Apparatus constants, i.e., heat capacity of the calorimeter and the thermal conductance were calibrated by using literature values of  $C_p$  for water [1] and toluene [2]. In this study,  $C_p$  measurements for the mixtures of  $x\text{H}_2\text{O}$  ( $1-x$ ) $\text{CH}_3\text{OH}$  at  $x=(0.0000, 0.2057, 0.5051, 0.6523, 0.7392, 0.8064, 0.8990, 0.9504)$  have been conducted in the temperature range between 280 K and 360 K at pressures from 0.1 MPa to 15 MPa. The composition dependence of our measurements at constant temperatures shows the maximum at about  $x=0.9$ . Based on the present results, we calculated the excess molar heat capacity at constant pressure,  $C_{pm}^E$ , and compared with those by Benson et al [3, 4] at 0.1 MPa. Our results are in good agreement with those by Benson et al. The results of ammonia and its aqueous mixtures will be presented at the conference.

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