

Anomaly in the Heat Capacity of Triethylamine and Water

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The heat capacity, C_p , of the liquid-liquid mixture triethylamine-water has been precisely measured using our own computer-based data acquisition and controlled adiabatic calorimeter. A step process of adding heat and then waiting several minutes for a stable temperature assures equilibrium values for the heat capacity from the known heat added and the resulting change in temperature. Several compositions in the vicinity of the critical composition have been investigated and show the typical lambda shape, when the heat capacity is plotted as a function of temperature. For a sample with a much larger concentration of triethylamine than the critical concentration, we observe strikingly different behavior in the heat capacity than that observed near-critical. The unusual behavior is reproducible and may be due to a structure forming in the sample. We acknowledge support from NSF-REU grant DMR 0243811.