Heat Capacity of Liquid Terpenes

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The determination of thermal properties of solids and liquids is very important for a variety of technological applications. In additions they can help in the formulation of equations of state of liquids and in the understanding of the solid materials structure and behavior under duty.

A differential scanning calorimeter (TG-DSC111, from *Setaram, France*) was calibrated by measuring the enthalpy of fusion and the temperature of fusion of several pure (99.999%) metals. Repeatability and reproducibility tests were performed to access the accuracy of the instrument. The accuracy was confirmed by using standard reference materials like sapphire (NIST SRM-707), toluene distilled and dried in molecular sieves and deionized water (Millipore), in the temperature range 300 - 800 K.

The results demonstrate that the calorimeter is capable of producing data of enthalpies of fusion and transition with an accuracy of 1%, temperatures of fusion within 0.1 K and heat capacities with an accuracy of 1 - 2%, depending on the temperature range and the sample.

Measurements of the heat capacity of α-pinene, β-pinene and limonene at atmospheric pressure, as a function of temperature are presented.