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Analysis of Thermal Properties of $Pr_{1-x}Nd_xOs_4Sb_{12}$ in the Range 10-300 K[1] SHOJI HISHIDA, TAYLOR MCCULLOUGH-HUNTER, PEI-CHUN HO, California State University, Fresno, BRIAN MAPLE, UC San Diego, TATSUYA YANAGISAWA, Hokkaido University, Japan — The compounds $PrOs_4Sb_{12}$ and $NdOs_4Sb_{12}$ have attracted interest due to their exotic properties at low temperature. At low temperatures, the Neodymium compound becomes ferromagnetic , while the Praseodymium compound exhibits unconventional heavy-fermion superconductivity. The series of doped compounds $Pr_{1-x}Nd_xOs_4Sb_{12}$ is being studied in order to understand the interaction between these effects. It has been shown that for particular concentrations of Nd and Pr, the phenomena of ferromagnetism and superconductivity are present simultaneously. In order to understand this system, it is necessary to characterize the normal-state behavior. The molar specific heat of $Pr_{1-x}Nd_xOs_4Sb_{12}$ was measured in the range of 10-300 K, and thermodynamic parameters of the sample are extracted from the specific heat data, including the Debye Temperature, Einstein Temperature, and electronic specific heat coefficient. These provide information about the lattice softening, rattling effect, and electron correlation respectively. The evolution of these properties with respect to the Nd concentration, x, can then be determined.

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