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Magnetic, Thermal and Transport Properties of $\text{LaNi}_2(\text{Ge}_{1-x}\text{P}_x)_2$ ¹ R.J. GOETSCH, V.K. ANAND, ABHISHEK PANDEY, D.C. JOHNSTON, Ames Lab. and Dept. Phys. Astron., Iowa State Univ., Ames, IA 50011 — Polycrystalline samples of $\text{LaNi}_2(\text{Ge}_{1-x}\text{P}_x)_2$ ($x = 0, 0.25, 0.50, 0.75, 1$) with the tetragonal ThCr_2Si_2 structure were investigated by heat capacity C_p , magnetic susceptibility χ , and electrical resistivity ρ measurements for temperatures $1.8 \text{ K} \leq T \leq 300 \text{ K}$. The $\rho(T)$ data for each sample reveal metallic behavior that follows the Bloch-Grüniesen theory. The low- T $C_p(T)$ data for the series yielded Sommerfeld coefficients $\gamma = 6\text{--}12 \text{ mJ/molK}^2$ and Debye temperatures $\Theta_D = 300\text{--}480 \text{ K}$. The $\chi(T)$ data showed nearly T -independent paramagnetism except for LaNi_2Ge_2 , where data up to 1000 K exhibit a broad peak at $\approx 300 \text{ K}$. A possible onset of superconductivity is seen for LaNi_2P_2 at 2.1 K. Analytic functions accurately representing the Bloch-Grüniesen and Debye functions are presented that are very useful for fitting $\rho(T)$ and lattice $C_p(T)$ data, respectively.

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- Prefer Oral Session
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