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Resistivity and anisotropic magnetization of single crystalline $R\mathbf{Ni}_{1-x}\mathbf{Bi}_{2\pm y}$ (R = La–Nd, Sm, Gd–Dy)[1] X. LIN, Iowa State University, WARREN STRASZHEIM, SERGEY BUD'KO, PAUL CANFIELD, Ames Laboratory, US DOE, Iowa State University — We present a detailed study of $R\mathrm{Ni}_{1-x}\mathrm{Bi}_{2\pm y}$ (R = La–Nd, Sm, Gd–Dy) single crystals by measurements of temperature dependent magnetic susceptibility, magnetization, and electrical resistivity. The isostructural compounds $RT\mathrm{Bi}_2$ and $RT\mathrm{Sb}_2$ are known to have widths of formation, except for T = Ag. The $R\mathrm{Ni}_{1-x}\mathrm{Bi}_{2\pm y}$ series forms with partial Ni occupancy as well as a variable Bi occupancy. For R = Ce–Nd, Gd–Dy, the $R\mathrm{Ni}_{1-x}\mathrm{Bi}_{2\pm y}$ compounds show local-moment-like behavior and order antiferromagnetically at low temperatures. Determination of anisotropies as well as antiferromagnetic ordering temperatures for $R\mathrm{Ni}_{1-x}\mathrm{Bi}_{2\pm y}$ (R = Ce–Nd, Sm, Gd–Dy) have been made. Although crystalline samples from this family exhibit minority, second phase, superconductivity at low temperatures associated with Ni-Bi and Bi contamination, no evidence of bulk superconductivity has been observed.

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