

Magnetic properties and magnetic structures in $R_2Ni_{2-x}In$ ($R = Gd-Tm$) for $x = 0$ and (0.22 or 0.3)

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The $R_2Ni_{2-x}In$ ($R=Gd-Tm$) compounds were investigated by means of different experimental techniques including X-ray diffraction, magnetic and specific heat measurements as well as powder neutron diffraction. The title compounds show two different crystal structure variants, namely: an orthorhombic one of the Mn_2AlB_2 -type in the stoichiometric composition R_2Ni_2In and a tetragonal one of the Mo_2FeB_2 -type in the nonstoichiometric composition $R_2Ni_{2-x}In$. All compounds show antiferromagnetic ordering at low temperatures, however, for a selected rare earth element the Néel temperature found for stoichiometric composition is higher than the one found for nonstoichiometric composition. Neutron diffraction experiments, performed for selected compounds, indicate that rare earths magnetic moments form collinear magnetic structures which are commensurate with the crystallographic unit cells.