

Magnetic phase transitions in (Nd, Dy)Co₂ and (Pr, Dy)Co₂ compounds

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Abstract: In a series of (Nd, Dy)Co₂ and (Pr, Dy)Co₂ compounds, the type of the magnetic phase transition was studied by magnetization and electrical-resistivity measurements. In both systems, a change of type was observed from second order (for NdCo₂ and PrCo₂) to first order (for compounds containing more than about 20% Dy). The results are discussed in the Inoue-Shimizu model, generalized in such a way that the presence of both light and heavy rare-earth atoms is taken into account. The volume dependence of the parameter a_3 (i.e. of the free-energy contribution $a_3 M_{\text{Co}}^2/4$) is supposed to play a decisive role in the determination of the order of the magnetic transition. ?? 1993.

Index Keywords: Cobalt compounds; Dysprosium; Electric conductivity; Electric resistance measurement; Magnetization; Rare earth compounds; Electrical resistivity; Free energy contribution; Heavy rare earth atoms; Inoue-Shimizu model; Intersublattice interaction; Light rare earth atoms; Magnetic moment; Magnetic phase transitions; Parameter; Phase transitions

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