

Magnetocrystalline anisotropy and R-Co exchange interaction in monocrystalline RCo_4Al (R = Y, Gd and Ho)

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Abstract: We report on the magnetic properties of the RCo_4Al (R: Y, Gd, Ho) monocrystalline samples. Al substitution for Co in RCo_5 results in remarkable changes of the magnetic properties not only of the Co sublattice but also of the R sublattice. These changes include a decrease of the magnetocrystalline anisotropy energy of the Co sublattice, a decrease of the R-Co exchange interaction and a remarkable modification of the crystal field parameters of the R sublattice. The effects of Al substitution in RCo_5 are compared with those of B substitution.

Author Keywords: Crystalline electric field; Magnetocrystalline anisotropy; Rare earth-3d transition metal compounds; Spin reorientation transition

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