ON THE MAGNETIC BEHAVIOUR OF $GdCo_{2-x}Cu_x$ COMPOUNDS

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9.7 cm

The $GdCo_{2-x}Cu_x$ compounds crystallize in a cubic C15 type structure for x$\leq$0.4. Magnetic measurements were performed in the temperature range 4.2-900 K and external fields up to 9 T. Band structure calculations were carried out by using the ab initio tight binding linear muffin tin orbitals method in the atomic sphere approximation.The compounds are ferrimagnetically ordered. The mean cobalt magnetic moments determined at 4.2 K are little dependent on composition. The saturation moments per formula unit, at 4.2 K, are in rather good agreement with those obtained from band structure calculations. The Gd 5d band polarizations were analyzed. The contribution from 4f-5d, M_{5d}(f), local exchange and 5d-3d short range exchange interactions, $M_{5d}(0)$, were determined. The $M_{5d}(0)$ values are proportional to cobalt magnetizations. The paramagnetic behaviour was also analyzed. Finally, the exchange interactions were discussed in correlation with band structure calculations.

13.4 cm

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