Magnetic Behaviour of $YCo_{4-x}M_xB$ Intermetallic Compounds with M=Al or Cu

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The $YCo_{4-x}M_xB$ compounds with M=Al or Cu crystallize in a hexagonal $CeCo_4B$ type structure, having P6/mmm space group for x$\leq$ 2. Magnetic measurements were performed in the temperature range, 5-900K and external fields up to 9T. Both saturation magnetizations, M_S, and Curie temperatures decrease dramatically when Cu and Al gradually substitute Co. As example, for M=Cu, the M_S values change from 2.65 $\mu_B/f.u.$(x=0) to 0.82 $\mu_B/f.u.$(x=1) and T_C from 385K to 205K, respectively. The alluminium compounds for $x > 1$ are paramagnetic and show a spin fluctuation behaviour. Band structure calculations were also performed. The composition dependence of Y4d band polarization was analysed considering the effect of short range exchange interactions with neighbouring Co atoms.

9.7 cm

13.4 cm

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