

MAGNETIC PROPERTIES OF $Tb_{1-x}Zr_xFe_2$ COMPOUNDS

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The $Tb_{1-x}Zr_xFe_2$ compounds with $x \leq 0.5$ crystallize in a cubic C15 structure. Magnetic measurements were performed in the temperature range 4.2-1000K and external magnetic fields up to 9T. All the compounds are ferromagnetically ordered. The Curie temperatures and the spontaneous magnetization at 4.2K decrease when the zirconium content increase. Considering the terbium magnetic moment like that determined on $TbFe_2$ by neutron diffraction, the iron magnetic moments at 4.2K were determined. The iron magnetic moments are dependent on composition, decreasing from $1.67\mu_B$ to $0.69\mu_B$. The temperature dependences of the reciprocal susceptibilities are non-linear. The iron effective magnetic moments, determined from linear region in the high temperature range are little dependent on composition. The ratio $r = \frac{S_P}{S_0}$ between the number of spins determined in the paramagnetic region and the number of spins at 4.2K increase when the zirconium content increase, suggesting the increase of the itinerancy. Finally, the magnetic behavior of iron in this compounds is analyzed.

9.7 cm

13.4 cm

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