MAGNETIC ANISOTROPY OF $\mathbf{Tb_{1,1}(FeCo)_{11}Ti}$ SINGLE CRYSTALS

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9.7 cm

The character of the spin-reorientation transition (SPR) and magnetocrystalline anisotropy of $Tb_{1,1}(FeCo)_{11}Ti$ single crystals has been investigated. The anisotropy study has been performed by means of torque and magnetization measurements in the temperature range 77-750K and in magnetic field up to1.25T. The temperature dependencies of the magnetcrystalline anisotropy constants were determined using least-squares fitting for the corrected experimental torque curves.It was found that the (SPR) from an easy plane to an easy axis in the $Tb_{1,1}(Fe)_{11}Ti$ single crystal takes place at temperature 405K. At a temperature greater 405K and up to Curie temperature magnetocrystalline anisotropy becames very small.It was discovered that increase in cobalt content in these compounds results in the appearence of a very narrow region of canted structure and the increase in the Curie temperatures.The existence of canted structure can be explained by a competition of the rare earth sublattice anisotropy and the sublattice anisotropy of the transition metal, in which cobalt is substituted for iron. It is worth noting that the very small increase of terbium in these compounds strongly affects their magnetic anisotropy as compared with the $Tb(FeCo)_{11}Ti$ single crystals.

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