MAGNETIC MOMENT OF Fe IN $RFe_{11}Ti$ (R = Y, Ho, Dy) INTERMETALLICS UNDER HIGH PRESSURE

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9.7 cm

The Fe–rich rare earth intermetallics exhibit extraordinary magnetovolume effects that are ascribed to volume instabilities of the Fe–moment m_{Fe}. Recently, a theoretical analysis elucidated the effect of the local Fe–environment on m_{Fe} in the family of Y–Fe intermetallics [1]. Conclusions of this analysis have been used to interpret the different pressure dependencies of m_{Fe} observed in the Fe–rich $YFe_{11}Ti$ and Y_2Fe_{17} intermetallics [2]. We report the magnetization measurements on $RFe_{11}Ti$ (R = Y, Ho, Dy) under pressure up to 1 GPa and at fields up to 5 T performed using a CuBe pressure cell in a SQUID magnetometer. The decrease of m_{Fe} under pressure depends very slightly on the R–elements in $RFe_{11}Ti$, where we have obtained $\mathrm{d}\ln m_{\mathrm{Fe}}/\mathrm{d}p|_{5K} = -0.030\ \mathrm{GPa}^{-1}$ and $-0.034\ \mathrm{GPa}^{-1}$ in $RFe_{11}Ti$ (R = Ho, Dy) and $YFe_{11}Ti$, respectively. This result contrasts with the strong dependence of $\mathrm{d}\ln m_{\mathrm{Fe}}/\mathrm{d}p|_{5K}$ on the R–elements in the R_2Fe_{17} intermetallics [3].

[1] R.F. Sabiryanov, S.S. Jaswal, Phys. Rev. B **57**, 7767 (1998)
[2] O. Mikulina et al., J. Magn. Magn. Mats. - in press (1999), {EMMA 98, Zaragoza}
[3] J. Kamarád et al., J. Appl. Phys. - in press (1999), {MMM 98, Miami}

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