Magnetic ordering schemes in $R_3T_4X_4$ compounds

E.Wawrzyńska and A. Szytuła

M. Smoluchowski Institute of Physics, Jagiellonian University
Reymonta4, 30-059 Kraków, Poland

This work is an attempt of a systematization of the magnetic structures of the $R_3T_4X_4$ (R – a rare earth atom, T – a transition metal, X – a *p*-electron element) compounds investigated by means of neutron diffraction in the course of a broader research programme [1]. The experiments were performed for over twenty samples containing La, Pr, Nd, Tb, Dy, Ho and Er. Although the determined structures indicate a huge diversity, some regularities were found. All the compounds are isostructural and crystallize in the $Gd_3Cu_4Ge_4$-type structure (space group Immm), where the rare earth ions occupy two non-equivalent positions. The paramount feature is antiferromagnetic ordering observed in all the compounds at low temperatures. The two rare earth sublattices appear to order entirely independently in many cases. The authors try to use different approaches in order to elucidate the observed behaviours and come to some conclusions concerning the factors responsible for the found magnetic ordering schemes.

---

[1] E. Wawrzyńska in "Magnetic structures of $R_3T_4X_4$ compounds", Ph.D. thesis, Institute of Physics, Jagiellonian University, Cracow, to be defended in 2005.

Name of the presenting author (poster): Ewa Wawrzyńska
e-mail address: e.w@wp.pl
url's: http://www.if.uj.edu.pl/ZFCS/index.html