MAGNETIC ORDERING OF $RAgSb_2$ COMPOUNDS

G. André[a], F. Bourée[a], M. Kolenda[b], B. Leśniewska[c], A. Oleś[c] and A. Szytuła[b]

[a] Laboratoire Léon Brillouin (CEA-CNRS) CEN-Saclay, 91191 Gif-Sur-Yvette Cedex, France

[b] Institute of Physics, Jagiellonian University, Reymonta 4, 30-059 Kraków, Poland

[c] Department of Physics and Nuclear Techniques, Academy of Mining and Metallurgy, Reymonta 19, 30-059 Kraków, Poland

9.7 cm

Results of neutron diffraction measurements for $RAgSb_2$ (R = Ce, Pr, Nd, Tb-Tm) compounds are presented. All the compounds crystallize in the tetragonal $ZrCuSi_2$-type of crystal structure and except for $CeAgSb_2$ they are antiferromagnets with the Néel temperature 11.0 K for R=Tb and 2.0 K for R=Tm. The $CeAgSb_2$ below T_C=9.5 K is a ferromagnet with the magnetic moment equal to 0.33 μ_B and parallel to the c-axis. Below T_N $PrAgSb_2$ has a collinear antiferromagnetic structure of AF II type with the magnetic unit cell (a,a,2c). In $NdAgSb_2$ a sinemodulated magnetic ordering described by the wave vector k=(0.5435,0,0) is observed. The compounds with R=Tb,Dy and Er below T_N have a collinear structure with a magnetic unit cell doubled along the a-axis respective to the crystal one. The magnetic structure of the Ho-compounds at T=1.4 K is similar to that observed in $TbAgSb_2$ and $DyAgSb_2$. When the temperature increases a commensurate collinear and an incommensurate sine modulated structures coexist. The two phases are observed at T=1.4 K also in $TmAgSb_2$. An increase of the temperature causes that the commensurate phase disappears. The magnetic moment is parallel to the b-axis for R=Tb and Dy compounds and parallel to the c-axis for R=Er and Tm which correlates with the signs B-parameter. In $HoAgSb_2$ magnetic moment forms angle ϕ_b=13.5^0 with the b-axis. An increase of temperature changes the angle ϕ_b.

13.4 cm

Subject category :

4. Rare Earths and Actinides, Alloys and Compounds

Presentation mode :
oral

Corresponding author :
Prof. dr hab. Andrzej Szytula

Address for correspondence :
Instytut Fizyki UJ 30-059 Krakow, Reymonta 4
tel (12) 632 48 88 / 5546
fax: (12) 633 70 86

Email address :
szytula@if.uj.edu.pl