Crystal structure and physical properties of $Ce_3T_2M_7$ (T = Fe, Co, Ni, Zn and M = Ge, Sn) ternary compounds

G. Chajewski[1] and A.P. Pikul[1]

[1] *Instytut Niskich Temperatur i Badań Strukturalnych Polskiej Akademii Nauk, P Nr 1410, 50-950 Wrocław 2, Poland*

Polycrystalline samples of novel ternary compounds $Ce_3T_2M_7$ (T =Fe, Co, Ni, Zn and M = Ge, Sn) were prepared by means of conventional arc melting the stoichiometric amounts of the elements and studied by means of X-ray powder diffraction and magnetization measurements performed in wide temperature and magnetic field ranges. Rietveld refinement revealed that all the phases studied crystallize in the orthorhombic $La_3Co_2Sn_7$-type structure (space group *Cmmm*, no. 65). The magnetization data analysis showed that at high temperatures the compounds $Ce_3Co_2Ge_7$, $Ce_3Co_2Sn_7$, $Ce_3Fe_2Ge_7$, $Ce_3Ni_2Sn_7$ and $Ce_3Ni_2Ge_7$ exhibit Curie-Weiss-like paramagnetism of nearly localized cerium magnetic moments. In $Ce_3Co_2Sn_7$, $Ce_3Ni_2Sn_7$ and $Ce_3Ni_2Ge_7$ the moments order antiferromagnetically below T_N = 4.4, 4.0 and 7 K, respectively, while a ferromagnetic-like features are observed in $Ce_3Co_2Ge_7$ below 7 K and in $Ce_3Fe_2Ge_7$ at about 8 K. The preliminary magnetic properties studies will be supplemented at the conference by the results of on-going electrical resistivity and specific heat measurements.