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Magnetic properties and structures of fibrous $R_{11}Ni_4In_9$ intermetallics (R = heavy rare earths) ALESSIA PROVINO, Dept of Chemistry, University of Genova, CLEMENS RITTER, ILL, Grenoble, KARL A. GSCHNEIDNER, Ames Laboratory & DMSE, Iowa State University, PIETRO MANFRINETTI, Dept of Chemistry, University of Genova, SUDESH K. DHAR, CMP & MS Deptm, TIFR, Mumbay, India, VITALIJ K. PECHARSKY, Ames Laboratory & DMSE, Iowa State University — The existence and the unusual self-assembled nano/microfibrous morphology of the $R_{11}T_4In_9$ (R = rare earth, T = Ni, Pd, Pt) phases has been recently studied [1,2,3]. All the rare earths (but Sc, Eu, Yb) form this ternary compound (orthorhombic $Nd_{11}Pd_4In_9$-type, $oC48$, $Cmmm$). The bundles of fibers grow parallel to the temperature gradient and along the short c-axis. In this presentation we describe the results of a detailed investigation of the physical properties (electrical resistivity, heat capacity, magnetization measurements) of $Tb_{11}Ni_4In_9$, $Dy_{11}Ni_4In_9$ and $Ho_{11}Ni_4In_9$ by orienting the fibers parallel and orthogonal, respectively, to the electric current and magnetic field. The unusual fibrous microstructure of these compounds leads to a strong anisotropy in their physical properties, with the c-axis of the orthorhombic cell being the easy magnetization and high electrical-conductivity direction. The magnetic structures of $Tb_{11}Ni_4In_9$ and $Ho_{11}Ni_4In_9$, which have multiple magnetic orderings, have been investigated by neutron diffraction. The complex magnetic behavior found in these phases is a result of the competing ferrimagnetic (along the c-axis) and antiferromagnetic (on the $a-b$ plane) orderings of the five R sublattices.

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