Synthesis, Structure and Properties of the High-pressure Modifications of the Ternary Compounds *RE*PtSn (*RE* = La, Pr, Sm)

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The hexagonal high-pressure (HP) modifications of the ternary compounds *RE*PtSn (*RE* = La, Pr, Sm) were prepared under multianvil high-pressure (9 – 14 GPa) high-temperature (1050 – 1400 °C) conditions from the orthorhombic normal-pressure (NP) modifications. The HP-*RE*PtSn stannides were investigated by X-ray diffraction on powders and single crystals: ZrNiAl type, space group *P*62*m*, $a = 762.6(2)$, $c = 418.55(7)$ pm, $wR2 = 0.1147$, 256 F^2 values and 14 variables for HP-LaPtSn, $a = 754.97(7)$, $c = 412.64(3)$ pm, $wR2 = 0.0782$, 252 F^2 values and 14 variables for HP-PrPtSn, and $a = 750.1(2)$, $c = 407.6(1)$ pm, $wR2 = 0.1060$, 229 F^2 values and 14 variables for HP-SmPtSn. The high-pressure modifications have two crystallographically independent platinum positions in trigonal prismatic coordination, $Pt1Sn_6RE_3$ and $Pt2Sn_3RE_6$. The shortest interatomic distances occur between the platinum and tin atoms within the three-dimensional [PtSn] networks. The rare earth atoms fill distorted hexagonal channels within these networks and they are bound through short *RE*-Pt contacts. Susceptibility measurements of HP-PrPtSn reveal paramagnetic behaviour with an experimental magnetic moment of 3.31(2) μ_B/Pr atom. Low-temperature susceptibility and specific heat data point to inhomogeneous magnetism in HP-PrPtSn.

Key words: Intermetallic Compounds, Magnetism, High-pressure Phases