

SrRhIn₂, SrPdIn₂, SrIrIn₂, and SrPtIn₂ – New Intermetallic Compounds with a Filled Variant of the CaIn₂ Structure

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Z. Naturforsch. **54 b**, 38–44 (1999); received August 28, 1998

Intermetallic Compounds, Crystal Structure, Chemical Bonding

SrRhIn₂, SrPdIn₂, SrIrIn₂, and SrPtIn₂ have been synthesized by reaction of mixtures of the elements in glassy carbon crucibles in a high-frequency furnace. The new compounds were investigated by X-ray diffraction on powders as well as single crystals: $a = 437.3(2)$, $b = 1091.9(5)$, $c = 798.0(2)$ pm for SrRhIn₂, $a = 453.54(7)$, $b = 1079.8(2)$, $c = 790.4(1)$ pm for SrPdIn₂, $a = 434.83(8)$, $b = 1102.6(2)$, $c = 798.6(2)$ pm for SrIrIn₂, $a = 447.5(1)$, $b = 1091.0(3)$, $c = 787.6(1)$ pm for SrPtIn₂. They adopt the MgCuAl₂ structure, a ternary ordered version of Re₃B. Chemical bonding analysis leads to the description of a filled SrIn₂ structure in which the In-In-bonding is modified by the insertion of transition metal atoms into the planar strontium layers, thus favoring strong indium-transition metal bonding.

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