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Crystal structures and magnetic properties of novel compounds Sc_2CoIn and $Sc_{100}Co_{25}In_7$

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ABSTRACT

Crystal structures of two novel scandium-rich ternary compounds forming in the Sc-Co-In system, obtained by arc-melting of pure metals, were determined using X-ray powder diffraction. The structure of Sc_2CoIn (space group *P*4/*mmm*, a = 3.2887(2), c = 7.1642(4) Å, Z = 1, R_I = 5.97 %) can be derived from the CsCl-type structure. In turn, the structure of $Sc_{100}Co_{25}In_7$ (space group *Fm*-3, a = 17.7411(5) Å, Z = 2, R_I = 8.08 %) is related to the structures of $Sc_{50}T_{13}In_3$ (T = Rh, Ir) and ε-$Ag_{7+x}Mg_{26-x}$ (x = 0.96). The magnetic properties of both phases were studied at low temperatures down to 1.7 K. The indide Sc_2CoIn was found to order antiferromagnetically at 65 K due to the magnetic moments carried on Co atoms. In contrast, $Sc_{100}Co_{25}In_7$ was characterized as a weak Pauli paramagnet.

Keywords: Scandium, Cobalt, Indium, Intermetallics, Crystal chemistry, Magnetic properties

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