

# Crystal structures and magnetic properties of novel compounds $\text{Sc}_2\text{CoIn}$ and $\text{Sc}_{100}\text{Co}_{25}\text{In}_7$

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**Crystal structures and magnetic properties of novel compounds****Sc<sub>2</sub>CoIn and Sc<sub>100</sub>Co<sub>25</sub>In<sub>7</sub>**

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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<sub>2</sub>CoIn (space group *P4/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<sub>100</sub>Co<sub>25</sub>In<sub>7</sub> (space group *Fm-3*,  $a = 17.7411(5)$  Å,  $Z = 2$ ,  $R_I = 8.08$  %) is related to the structures of Sc<sub>50</sub>T<sub>13</sub>In<sub>3</sub> ( $T = \text{Rh, Ir}$ ) and  $\epsilon\text{-Ag}_{7+x}\text{Mg}_{26-x}$  ( $x = 0.96$ ). The magnetic properties of both phases were studied at low temperatures down to 1.7 K. The indide Sc<sub>2</sub>CoIn was found to order antiferromagnetically at 65 K due to the magnetic moments carried on Co atoms. In contrast, Sc<sub>100</sub>Co<sub>25</sub>In<sub>7</sub> was characterized as a weak Pauli paramagnet.

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

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