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Low-temperature magnetic ordering in $\text{Ce}_6\text{Pd}_{12}\text{In}_5$

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The novel ternary intermetallic compound $\text{Ce}_6\text{Pd}_{12}\text{In}_5$ forms in a well-defined atomic stoichiometry with a hexagonal crystal structure (space group $P6_3/mcm$) and a unique atom in each of the crystallographic sites available in this space group. The bonding lengths are comparatively short and suggest strong interaction especially between Ce and Pd atoms. In this work we report on our findings of the first studies into the physical properties of $\text{Ce}_6\text{Pd}_{12}\text{In}_5$. A key finding is the occurrence of long-range ferromagnetic-like order below $T_C = 1.6$ K, where the specific turns into a lambda-like anomaly peaking at $C_P = 8$ J/(mol Ce K). The electrical resistivity hints at a low-lying Kondo scale in this compound. The magnetic susceptibility shows well-defined Curie-Weiss behaviour over an extended temperature range with an effective magnetic moment value that is indicative of conduction-electron hybridization effects on the Ce localized moment. The 4f-electron derived magnetic contributions to the entropy and to the electrical resistivity in $\text{Ce}_6\text{Pd}_{12}\text{In}_5$ are assessed by means of the nonmagnetic counterpart $\text{La}_6\text{Pd}_{12}\text{In}_5$.

**Level (Hons, MSc,
 PhD, other)?**

other

**Consider for a student
 award (Yes / No)?**

No

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

Yes

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