

**Intriguing physical properties of the As-based filled skutterudites**  
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9.7 cm

First-ever single crystals of As-based filled skutterudites have been grown by a high-pressure Cd/As-flux method. Sufficiently large specimens enable a comprehensive research of their ground state. While low-temperature physical properties of LaRu<sub>4</sub>As<sub>12</sub> (superconductivity), CeRu<sub>4</sub>As<sub>12</sub> (non-Fermi-liquid behavior), PrFe<sub>4</sub>As<sub>12</sub> (complex ferromagnetic state), and PrOs<sub>4</sub>As<sub>12</sub> (multiple low-*T* ordered phases) will be briefly reviewed, a magnetic-field-driven metal-insulator transition in CeOs<sub>4</sub>As<sub>12</sub> will be discussed in detail: Below about 130 K, the electrical resistivity increases by two orders of magnitude upon cooling to 65 mK. At the lowest temperatures ( $T < 3$  K), both the electrical resistivity and Hall resistivity are significantly suppressed by a magnetic field  $B \simeq 3$  T. Whereas these effects depend on the magnetic-field orientation, the further increase of  $B$  does not significantly affect the charge transport in CeOs<sub>4</sub>As<sub>12</sub>. Remarkable that its zero-field thermoelectric power displays a broad peak at around 2 K. Additionally, the Sommerfeld coefficient to the heat capacity as small as  $7 \text{ mJK}^{-2}\text{mol}^{-1}$  is barely influenced by  $B \leq 9$  T. Finally, a nonmagnetic or weakly magnetic ground state is inferred from the magnetization data. These experimental findings for CeOs<sub>4</sub>As<sub>12</sub> apparently point at an energy-gap formation due to a hybridization between  $4f$  electrons and conduction electrons.

13.4 cm

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