

## High pressure features of the Ce-based filled skutterudite compounds

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The electrical resistivity of the filled skutterudite compounds  $\text{CeOs}_4\text{Sb}_{12}$  and  $\text{CeRu}_4\text{Sb}_{12}$  have been measured at temperature 2 to 300 K under high pressure from 2 to 8 GPa. The resistivity in  $\text{CeOs}_4\text{Sb}_{12}$  shows semiconducting behavior below about 70 K and is proportional to  $\exp[(T^*/T)^{1/2}]$  below about 20 K at 2 GPa. It is found that the reciprocal characteristic temperature  $1/T^*$  is proportional to the pressure  $P$ . The dependences of resistivity on both temperature and pressure are consistent with Efros-Shklovskii type variable-range hopping (VRH) conduction [1]. This fact indicates the importance of long range Columb correlations in the semiconducting resistivity in this compound.

Above 6 GPa, we observed metal-semiconductor transition in  $\text{CeRu}_4\text{Sb}_{12}$  at low temperature and a energy gap estimated from activation law was enhanced with increasing pressure at a rate of 12.2 K/GPa. Semiconductive behavior of  $\text{CeRu}_4\text{Sb}_{12}$  under high pressure may have the same origin as other Ce-based skutterudite compounds which show semiconducting behavior.

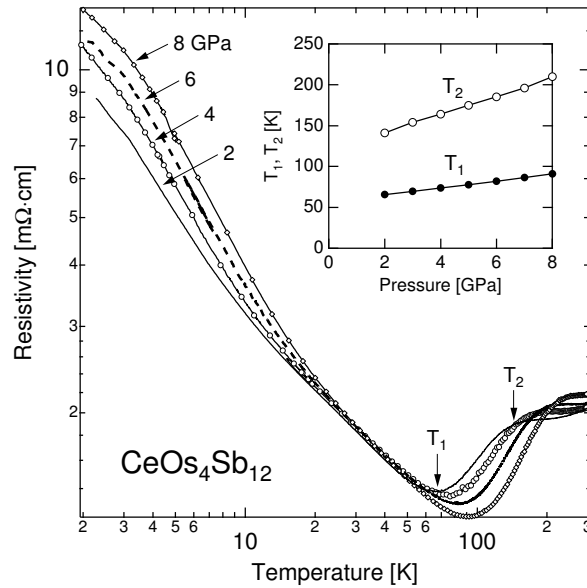


Figure 1: Temperature dependence of the electrical resistivity of  $\text{CeOs}_4\text{Sb}_{12}$  under several constant pressures. The inset shows the pressure dependence of  $T_1$  and  $T_2$ .

[1] A. L. Efros, B. I. Shklovskii, J. Phys. C; Solid State Phys. **8** (1975) L49.