

# Metallization and Superconductivity in BaReH<sub>9</sub>

## Scientific Achievement

Finding of metallization and superconductivity in the most hydrogen-rich ionic salt BaReH<sub>9</sub> at extreme pressure

## Significance and Impact

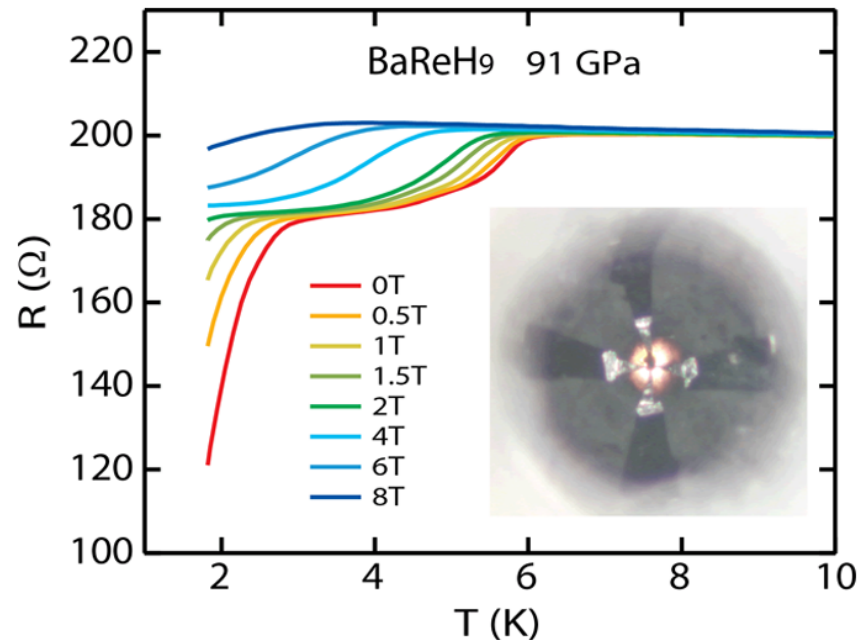
This result provides data needed to understand superconductivity expected to occur in hydrogen and some metal hydrides at extreme pressure.

## Research Details

- Careful high pressure experiments using diamond anvil cells allow us to induce and observe metallization and superconductivity of the highly reactive compound BaReH<sub>9</sub>.
- The metallic state of BaReH<sub>9</sub> was examined by electrical resistivity and the crystal structure determined by synchrotron X-ray diffraction, neutron diffraction and Raman spectroscopy.

Muramatsu, T, Wanene, W.K., Somayazulu, M., Vinitsky, E., Chandra, D., Strobel, T.A., Struzhkin, V.V., & Hemley, R.J., Metallization and superconductivity in the hydrogen-rich ionic salt BaReH<sub>9</sub>. *J. Phys. Chem. C*, 119, 18007 (2015).

Facilities: Carnegie, SNS, APS



Temperature dependence of electrical resistivity of BaReH<sub>9</sub> at 91 GPa. A magnetic field suppresses the superconducting state. Inset: photo of the sample under pressure.