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Electrical cell assembly for reproducible conductivity experiments in the multi-anvil

Anne Pommier[1,*] and Kurt D. Leinenweber[2]

[1]Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, University of California-San Diego, La Jolla, California 92093, U.S.A.
[2]School of Molecular Sciences, Arizona State University, Tempe, Arizona 85287-1604, U.S.A.

Abstract

Electrical conductivity experiments under pressure and temperature conditions relevant to planetary interiors are a powerful tool to probe the transport properties of Earth and planetary materials as well as to interpret field-based electrical data. To promote repeatability and reproducibility of electrical experiments among multi-anvil facilities that use this technique, we designed and developed an electrical conductivity cell for multi-anvil experiments based on the 14/8 assembly that was developed to allow access to high temperatures. Here we present the details of design and parts developed for this cell that is available via the Consortium for Material Properties Research in Earth Sciences (COMPRES). The electrical cell has been tested up to 10 GPa and about 2000 °C on different materials (silicates and metals, both in the solid and liquid state).

Keywords: Multi-anvil, electrical conductivity, cell assembly, melts, silicates, metals