

Application of electrical impedance spectroscopy to brine-saturated porous materials

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The fluid in mantle and crustal rocks plays important roles in a wide variety of mechanical and chemical processes. In order to clarify the roles of fluids, it is needed to understand the fluid distribution in rocks. Electrical impedance spectroscopy is a non-destructive method to investigate material structures. Using brine-saturated glass spheres as an analog of fluid-saturated rocks, we have been testing the validity of this method in studying the fluid distribution in rocks. The electrical impedance is measured at the frequency from 20 mHz to 1 MHz. We characterize a specimen in terms of the pore connectivity, the aspect ratio of pores, and their distribution functions. The pore structure is independently observed by the optical technique. We will compare the differently obtained structural information, and discuss the validity of the electrical impedance spectroscopy.