

Electrical conductivity variation of rock under metamorphic P-T conditions

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We have performed electrical conductivity measurements on sintered rock sample, raw rocks and mineral from well-known geological sites. Experimental data collected using high pressure and temperatures methods produce clear Arrhenius diagrams of various rocks and mineral. To measure the conductivity of single crystal brucite, we used single crystal sapphire capsule to avoid contamination and not react with surrounded materials. Though small amount of H₂O was formed after dehydration, bulk conductivity of the sample showed high conductivity. A granulite sample was obtained from Hidaka metamorphic belt, Hokkaido and gneiss, basic rock and amphibolites were obtained from Higo metamorphic belt, Kyushu. These rocks were selected as being representative of mid- to lower crust. Pressures for measurement are 0.5 - 1 GPa and which represent that of the mid- to lower crust. The temperature was raised up to about 1000 K. We also measured the conductivity of above mentioned rocks. Consequently, we found remarkable electrical conductivity variations over the metamorphic conditions. The laboratory measurements of electrical conductivity for hydrous rocks and hydrous mineral help us to interpret Electro-Magnetic (EM) soundings. Research on conductivity of crustal rocks and mineral are necessary to comprehend physical/chemical conditions within the crust.