E1-11 : INVESTIGATION OF ELECTRICAL CONDUCTIVITY OF ZIRCON CERAMICS

T M T N Tennakoon, B S B Karunaratne, P Ekanayake
Dept. of Physics, University of Peradeniya.

Zircon is an abundant raw material in Sri Lanka, and has many high technological applications in the ceramic industry. In this work, dense sintered materials were prepared using purified zircon sand to study the electrical conductivity in the temperature range 500 - 700°C.

Pellets 16 mm diameter and 2.6 mm think, were prepared by pressing under 100 MPa pressure and subsequent sinteriong at 1400°C for 3 hours. Both sides of the pellets were gold coated to obtain a better contact with platinum electrodes. A high temperature sample holder was designed and constructed for taking measurements at high temperature. The real and imaginary parts of the a.c impedance were measured by using an impedance analyzer interfaced to a computer. Activation energy was obtained via the Arrhenius plot of conductivity vs temperature.

The observed average conductivity of the prepared samples was about 1.59×10^{-4} $(\Omega.m)^{-1}$. The activation energy for the conducting process was about 0.8 eV and is comparable with the values reported in literature for similar materials.