

Dielectric and conduction processes and behaviours in Ni_{0.3}Zn_{0.7}Fe₂O₄

ABSTRACT

Dielectric relaxation and conductivity of Ni_{0.3}Zn_{0.7}Fe₂O₄ (NZF) were studied in the frequency range between 0.01 Hz to 3 MHz and temperature range within 313 K to 473 K. The sample was prepared by mixing Zinc Oxide, Nickel Oxide and Iron Oxide and sintered at 1573 K for 10 hours long. Dielectric properties were studied using Novo Control Dielectric Spectrometer. Dielectric relaxation and conductivity phenomena were discussed using an empirical model to key out the dielectric relaxation process. Analyze peak frequency relaxation process consist of four slopes to explain the dielectric relaxation process. The conductivity of the sample indicates an activated process and activation energy of dc conductivity is 0.44 ± 0.01 eV.

Keyword: Dielectric relaxation; Conductivity; Peak frequency; Equivalent circuit; Nickel zinc ferrite