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Abstract

In this paper, the $Sr_2FeSi_2O_7$-crystallized glass-ceramics was successfully prepared by conventional melt casting followed by heat treatment method in the SrO-Fe_2O_3-SiO_2-B_2O_3 glass system. The XRD, SEM and EDS results show that the crystalline $Sr_2FeSi_2O_7$ is obtained with uniform microstructures and its grain size around 0.5-0.7 μm. The magnetization hysteresis (M-H) loop of the glass-ceramics exhibits typical ferromagnetic behavior with saturation magnetization values M_s=10.527 emu/g and coercive field H_c=210.462 Oe. In addition, some electric characteristics of (dielectric, impedance and conductivity) of the glass-ceramics have been investigated in a wide rang of frequency (20 Hz-2000 kHz) and temperature (220-440 ^oC) ranges. The dielectric dispersion phenomenon in ε' and ε'' with frequency can be explained by Maxwell-Wagner model. Moreover, the complex impedance measurement provides a clear rationalization of the Maxwell-Wagner type of relaxation, namely crystalline phase and glassy phase contributions. The step-like feature of *ac* conductivity, plateau and dispersive regime can be explained by the Jump Relaxation Model (JRM) and *dc* conductivity is found to obey the Arrhenius law. The temperature dependence of *n* is investigated to explain the conduction

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