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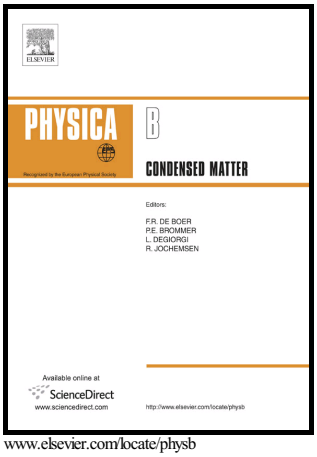

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Abstract

Polycrystalline (1-x) $Na_{0.5}Bi_{0.5}TiO_3$ (NBT) – (x) $BaFe_{12}O_{19}$ (BaM) [x in wt%= 40, 30, 20 and 10] novel particulate magnetoelectric (ME) composite systems have successfully fabricated by the solid-state reaction method. The Rietveld refinement of X-ray diffraction pattern is provided the evidence about the pure phase formation of desired composite systems. Scanning Electron Microscopic (SEM) images are provided the information about grain size and connectivity of both the phases in composite systems. The microstructural conduction mechanism of all the composite systems has been systematically investigated with the help of complex impedance spectroscopic technique. From both impedance and modulus spectroscopic study it is observed that different interfaces (BaM-BaM, BaM-NBT and NBT-NBT) are activated at different temperature ranges (in all the systems). It is also observed that, decreasing of BaM wt% has the significant effect on conduction mechanism of different interfaces. With decreasing of BaM wt% it has been perceived that BaM-NBT interfaces conduction gradually dominating over BaM-BaM interfaces conduction at room temperature (RT) due to which S1(NBT90) composite system has shown positive temperature coefficient of resistance (PTCR) behavior.

Keywords: Composite, Impedance, Modulus, Relaxation process

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