

Study of a.c. and d.c. Conductivities of Lead Free $\text{Sr}_5\text{LaTi}_3\text{V}_7\text{O}_{30}$ Ceramic

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Abstract : Ceramics are very widely used as base materials for composite film and high frequency resistors for their good insulating behavior. So it needs a careful study of the ac and dc conductivity of these materials. $\text{Sr}_5\text{LaTi}_3\text{V}_7\text{O}_{30}$ is a lead free Tungsten Bronze ceramic prepared by high temperature solid state reaction route. The preliminary structural analysis of the compound confirms the formation of single-phase orthorhombic structures at room temperature. Surface morphology of the compound is studied by scanning electron microscopy. The sample showed no structural differences, non-uniformly distributed grains, no ferro-paraelectric transition temperature within observed experimental temperature range. Ferroelectrics exhibit different conduction mechanism. In this paper focuss is made on the study of a.c. and dc electrical conductivity. The frequency dependent a.c. conductivity obeys the Jonscher's power law. The nature of variation of dc conductivity with temperature suggests Arrhenius type of electrical conductivity.

Keywords: Ceramics, X-ray diffraction, SEM, Electrical conductivity.

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