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# CONDUCTIVITY STUDIES AND DIELECTRIC BEHAVIOUR OF PVDF-HFP-PVC-LiClO4 SOLID POLYMER ELECTROLYTE

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## ABSTRACT

The polymer electrolytes comprising the blend of polyvinylide fluoride-hexafluoropropylene and polyvinyl chloride as the host polymer and lithium perchlorate as the dopant were prepared by solution casting technique. The polymer blend film containing 35 wt.% LiClO4 exhibited the highest room temperature conductivity in the order of magnitude ~10-4 S cm-1. The conductivity and dielectric behavior of selected electrolytes systems were analyzed. The dielectric constant, εr and dielectric loss, εi increases with temperature in the low frequency region, but almost negligible in the high frequency region. This is due to electrode polarization effects. The real part, Mi and imaginary part, Mr electrical modulus show an increase at the high frequency end. The present of Mi peak in the plot Mi versus frequency indicates that the systems are ionic conductors. The phenomenon suggests a plurality of relaxation mechanism. The log conductivity versus 1000 reciprocal of temperature (log σ vs 1000/T) plots shows regression values close to unity, indicating that the plot obeys Arrhenius relationship. The frequency dependence of conductivity follows the universal power law variation, σ (ω) Aω∝s. The plot of pre-exponent s versus temperature suggests that the conduction mechanism in the system film can be described using a Small Polaron model (SP).

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