

**EFFECT OF MICRO-SIZED SILICON DIOXIDE (SiO₂) ON THE
ELECTRICAL PROPERTIES OF CHITOSAN BASED POLYMER
ELECTROLYTE**

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ABSTRACT

EFFECT OF MICRO-SIZED SILICON DIOXIDE ON THE ELECTRICAL PROPERTIES OF CHITOSAN-BASED POLYMER ELECTROLYTE

Polymer electrolyte based on lithium triflate, LiCF_3SO_3 salt, high molecule weight of chitosan from natural polymer and filler micro sized silicon dioxide, SiO_2 was prepared using casting technique. The effect of filler micro-sized silicon dioxide on the ion mobility of chitosan- LiCF_3SO_3 electrolyte has been investigated. The ionic conductivity of chitosan- LiCF_3SO_3 - SiO_2 system has conducted over wide range of frequency and at temperatures between 303 K and 343 K. The conductivity is due to the ionic mobility and charge carrier. The conductivity was calculated using the value of bulk impedance that obtain from the impedance spectroscopy by the Cole-cole plots illustrating the variation of the negative imaginary impedance with the real impedance. Dielectric data were analyzed using the complex permittivity, ϵ^* , complex electrical modulus, M^* , tangen loss, $\tan \delta$, relaxation time and activation energy have determines at various temperature and frequencies. The temperature dependent conductivity data for each sample obeys an Arrhenius relationship. FTIR spectroscopy technique were used in the complexation studies.