



## Synthesis, Characterization and Conductance Studies of Inorganic Precipitate Synthetic Membrane

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### ABSTRACT

*The electrical conductivity of simple metal ions across the parchment supported lead tungstate membrane bathed in different concentration of 1:1 electrolytes (KCl, NaCl and LiCl) at several temperature ranges are reported. Absolute reaction rate theory has been applied to derive various thermodynamic parameters,  $E_a$ ,  $\Delta H^\ddagger$ ,  $\Delta F^\ddagger$  and  $\Delta S^\ddagger$ . The activation energies are found to depend on the size of penetrant species and decrease with the increase in the concentration of the bathing solutions. It is concluded that the membrane is weakly charged and ionic species retain their hydration shell at least partially, while diffusing through the membrane pores. The values of  $\Delta S^\ddagger$  are negative indicating, that partial immobilization of ions takes place probably due to the interstitial permeation and ionic interaction with the fixed charge groups of the membrane skeleton. The membrane has been characterized on the basis of thickness, porosity, water uptake and swelling. The membrane has also been characterized on the basis of scanning electron microscopy (SEM) and Fourier transformed infrared (FTIR) analysis.*

**Keywords:** Conductance, thermodynamic parameters, lead tungstate membrane.

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