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**Electrical Conductivity Studies on LiCl Doped Zinc Borate Glasses**

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**Abstract**

Lithium ion conducting ternary glass system xLiCl-(100-x)[0.68B2O3:0.32ZnO] with 25≥x≥5 mol% is prepared by microwave heating method. The ion conductivity is analysed using single power law proposed by Almond-West. The electrical conductivity is studied in the temperature range of 300-400 K and over a frequency range of 100 Hz-10MHz. Cole-Cole plots of these glasses showed and semicircle with spur indicating that single transport mechanism is operating. DC conductivities follow Arrhenius law and increases with increasing LiCl content. While the DC activation barrier calculated from linear least square fit show a stepwise decrement with increasing LiCl content. The observed increase in σdc and decrease in Edc with LiCl mol% is attributed to the enhanced Li+ ion content and opening of network structure caused due to the occupation Cl- ions around Li+ ions. A.C. activation barrier and frequency independent d.c. conductivity are comparable with those obtained in temperature dependent conductivities. Concentration of Li+ ions and structural degradation play a pivotal role in the ion transport in disordered systems.

**Keywords:**

Impedance Spectroscopy; Activation Energy; Ion Conductivity; Power Law Exponent.

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