

SYNTHESIS AND CHARACTERIZATION OF LLZO SOLID ELECTROLYTE EMPLOYING XRD AND EIS TECHNIQUES

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Solid electrolytes for lithium batteries are considered as an alternative to face some of the batteries problem applications. Materials such as $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ (LLZO) have shown good Li-ionic conductivity. In this work, LLZO was obtained by sol-gel process. Crystallization was performed at 900°C for 10 hours, the crystallization temperature was reached with a heating rate of 100°C per hour. The obtained phases were identified by X-ray diffraction (XRD). The ionic conductivity was measured by electrochemical impedance spectroscopy (EIS) with ± 10 mV amplitude and frequencies 100 kHz to 10 mHz. The obtained phase belongs to the cubic crystal system with the space group Ia3d which has promising properties to be employed as a solid electrolyte. Unlike the tetragonal phase, the cubic phase has better stability and higher ionic conductivity.

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