Electrical Properties of Li₂O-V₂O₅-TeO₂ Glasses for Solid State Electrolyte

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Abstract: Ternary tellurite glassy systems (Li₂O-V₂O₅-TeO₂) have been synthesised using Vanadium oxide as a network former and Lithium oxide as network modifier. The addition of a metal oxide makes them electric or mixed electric-ionic conductors, which are of potential interest as cathode materials for solid-state batteries.

This glass-ceramics crystallized from the Li₂O-V₂O₅-TeO₂ system are particularly interesting, because they exhibit high conductivity (up to 5.63×10⁻⁴ S/cm) at room temperature. The glass samples were prepared by quenching the melt on the copper plate and the glass-ceramics were heat-treated at crystallizing temperature determined from differential thermal analysis (DTA). The electric D.C conductivity result have been analyzed in terms of a small polaron-hopping model.

Key Words: Conductivity, Glass-Ceramics