Thermally Activated Ionic Transport and Nondebye Relaxation in $AgI - Ag_2O - SeO_2 - MoO_3$ Mixed Former

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Abstract:
Ion-conducting glasses in the $\mathbf{AgI - Ag_2O - SeO_2 - MoO_3}$ system have been synthesized and investigated to understand their electrical relaxation and transport behavior using electrical modulus formalism. The complex modulus spectra exhibit clear non-Debye relaxation features, indicating the presence of distributed relaxation processes associated with structural disorder and mixed network former effects. The Havriliak-Negami (HN) model provides an excellent fit to the experimental data, yielding parameters that reveal the asymmetric nature of ion relaxation. The relaxation time (τ_{HN}) follows Arrhenius behavior. The activation energy drops off rapidly with an increase in $\mathbf{AgI}$ content. The weak temperature dependence of the HN shape parameters additionally confirms the stability of ion dynamics across compositions.

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