

THE INTERNAL FRICTION IN GLASSY $\text{Li}_2\text{B}_4\text{O}_7$

*V. S. Bilanich, N. D. Baysa¹, V. M. Rizak,
I. M. Rizak², V. M. Holovey, A. M. Solomon³*

Uzhgorod National University
(Uzhorod, Ukraine),

¹Kyiv Institute of Management
and Informational Technologies
Adjusted to the National Aviation University
(Kyiv, Ukraine),

²Dniepropetrovsk National University
(Dniepropetrovsk, Ukraine),

³Institute of Electron Physics,
Nat. Acad. Sci. of Ukraine
(Uzhorod, Ukraine)

S u m m a r y

Temperature-frequency dependences of internal friction and shear modulus in glassy $\text{Li}_2\text{B}_4\text{O}_7$ from room temperature up to 600 K in the frequency range $5 \div 100$ mHz are studied by the technique of stimulated torsional vibrations. In the temperature range $380 \div 420$ K, the anomalies of mechanical properties are found. Their intensity and temperature position depend on the deformation value. The activation volume and radius of a kinetic particle are determined, the value of the latter being close to the lithium ion classical radius. The appearance of the mechanic loss maximum in the range $380 - 420$ K is related to the thermal activation of weakly bound lithium cations and their migration from one energetically equivalent position to another one under a periodically variable external mechanical field. The observed increase in mechanic losses and compliance at $T > 500$ K is explained by the beginning of glassy $\text{Li}_2\text{B}_4\text{O}_7$ softening and entering the temperature interval of the α -process of mechanical relaxation.