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RAYLEIGH-BRILLOUIN LIGHT SCATTERING IN CHALCOGENIDE GLASSES OF THE As-Sb-S

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Rayleigh-Brillouin scattering spectroscopy an efficient method for studying the microinhomogeneous structure glass this technique makes it possible to estimate the contributions of fluctuations of different nature to the light scattering from and determine the ranges of compositions from glass and to determine the ranges of compositions with minimum and maximum evolution of fluctuation microinhomogeneities. In addition, this method can be used for nondestructive testing of optical, elastic and elasto-optical constants of optical glasses, including glasses with distributed parameters, laser glasses and activated glasses.

In this study, we report the results of measuring the Rayleigh-Brillouin scattering spectra of the glassy alloys of the As-Sb-S system set and their analysis aimed at detecting the contribution of fluctuation of different nature with a change in composition to the Rayleigh scattering and the results of calculation of the longitudinal hypersonic velocities of the, the high-frequency longitudinal elastic modulus, and extinction(turbidity) coefficient at the wavelength $\lambda=0.6329 \mu\text{m}$.

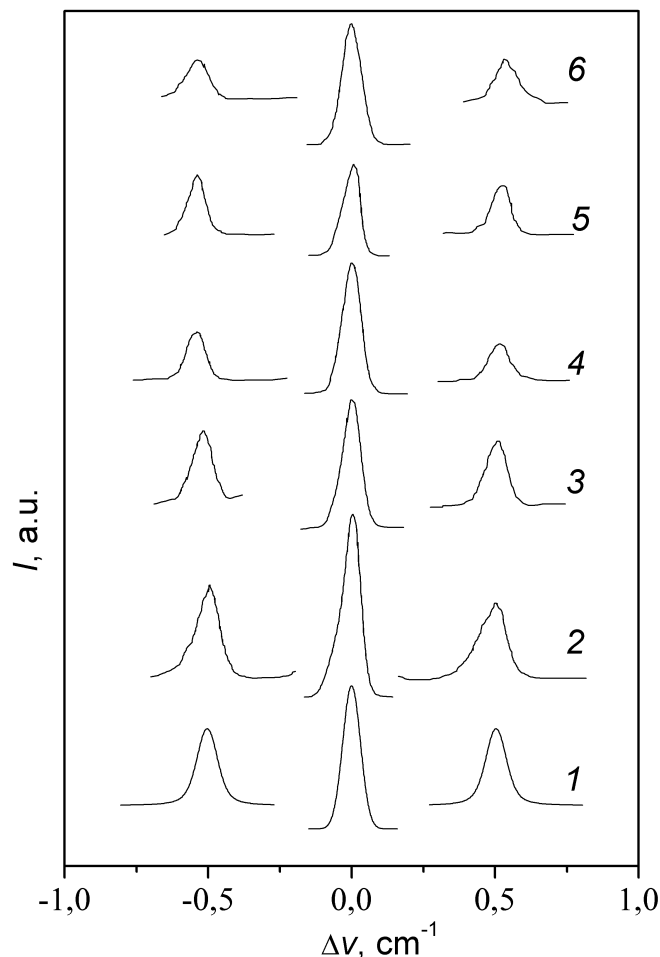


Fig.1. Rayleigh-Brillouin scattering spectra of the glassy alloys from the $\text{As}_2\text{S}_3\text{-Sb}_2\text{S}_3$.

The Brillouin scattering spectra of the glassy alloys from the $\text{As}_2\text{S}_3\text{-Sb}_2\text{S}_3$ set are shown in fig.1. Comparison of the results calculation of the velocities of longitudinal hypersonic waves from



the values of the Brillouin shifts $\Delta\nu$ using the acoustic data showed that the discrepancies in their values are within the error; i.e., there is no dispersion of their frequency of the speed of sound at room temperature and in the frequency range 13-15 GHz, which one would expect. The frequency shifts and the hypersonic velocities measured by us are in good agreement with the data of which were obtained using the wavelength of a krypton laser. The change in the hypersonic velocity with the an increase in the content of Sb_2S_3 is due to the difference in the force constants of the As-S and Sb-S.