

ELECTRICAL AND OPTICAL PROPERTIES
OF $\text{AgGaGe}_2\text{S}_2\text{Se}_4$ SINGLE CRYSTALS

*G.L. Myronchuk, G.E. Davyduk, O.V. Parasiuk,
M.V. Shevchuk, O.V. Jakymchuk, S.P. Danyl'chuk*

Lesya Ukrainka Volyn National University
(13, Volya Ave., Luts'k 43025, Ukraine;
e-mail: *g_muronchuk@ukr.net*)

S u m m a r y

Single crystals of the solid solution 50 mol.% AgGaGeS_4 + 50 mol.% $\text{AgGaGe}_3\text{Se}_8$ are studied. Due to a statistical distribution of Ga and Ge atoms over the relevant crystal lattice sites and the presence of vacancies at Ag sites, the solid solution exhibits properties of disordered semiconductors with the maximum density of localized energy states near the middle of the energy gap. The optical and thermal bandgap energies, as well as their temperature dependences, have been determined ($E_g \approx 2.30$ eV at $T \approx 300$ K). $\text{AgGaGe}_2\text{Se}_4$ single crystals are found to be photosensitive p -type semiconductors with the Fermi level locating near the middle of the bandgap. The peculiarities in the conductivity of the samples and the spectral distribution of their photoconductivity have been examined. A consistent physical model that explains the experimental results has been suggested.