# The Effect of $C_3H_5(OH)_3$ Intercalation on the Electrical Properties of InSe and $In_2Se_3$ Layered Crystals

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Intercalation [1] as nanotechnological approach to instrumentation in various fields of modern science and technology is difficult to overestimate.

The base materials for the experiments were InSe and $In_2Se_3$ layered crystals, which were grown by the Bridgman method. The samples which were studied had the appearance of rectangular parallelepiped. In the experiments was used a method of exposition intercalation. Samples were placed in a liquid environment $C_3H_5(OH)_3$, which had the same temperature of the material [2]. Therefore, the main parameter intercalation process was the time exposure.

Measurements of electrical parameters of the samples were carried out by Hall Effect. Samples were placed in a $C_3H_5(OH)_3$ cell. The experiment lasted 21 days.

The dependence of the electrical conductivity and majority carrier concentration from exposure time are shown in Fig. As can be seen from the figure, the intercalation $C_3H_5(OH)_3$ of samples leads to increase the electrical conductivity and majority carrier concentration for $In_2Se_3$ to a greater extent than for samples InSe. In addition, for samples InSe<$C_3H_5(OH)_3$> were performed measurements of electrical parameters at nitric temperature.

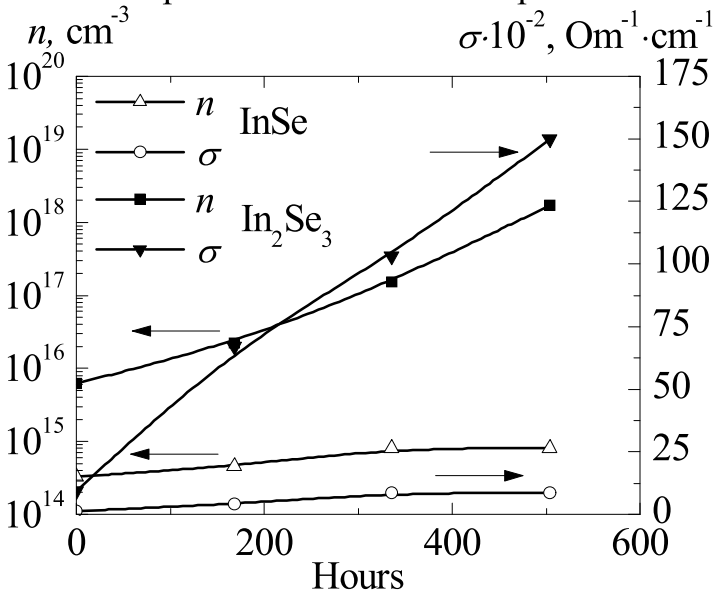


Fig. The dependence of the electrical conductivity and majority carrier concentration from exposure time for samples InSe та $In_2Se_3$.

1. McKinnon W.R., Haering R.R. Physical mechanisms of intercalation//Modern Aspects of Eiectrochemistry. New York. – 1983. – № 15. – P. 235-261.
2. Boledzyuk V.B., Kovalyuk Z.D., Pyrlya M.M., Barbutsa S.G. Optical and Electrical Properties of InSe and GaSe Layered Crystals Intercalated with Ethanol. Ukr. J. Phys. – 2013, – Vol. 58, N 9, – P. 857-862.