

## CREATION OF ZNSE NANOCCLUSERS IN A SILICON DIOXIDE TRACK TEMPLATE ON SILICON

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In this work, we study the formation of zinc selenide nanocrystals during chemical deposition into a-SiO<sub>2</sub>/Si-n track template. The relevance of the study is related to the production of new nanoclusters using track templates. One of the methods for obtaining nanoclusters is template synthesis. Template synthesis is a relatively simple and easy procedure, thanks to which the fabrication of rather complex nanomaterials has become available to almost any laboratory [1].

For the first time, zinc selenide nanocrystals were obtained by chemical precipitation in an aqueous alkaline medium using sodium selenosulfate as a source of Se ions. The deposition was carried out at a temperature of  $t = 75^{\circ}\text{C}$  for 40 min. The morphology was observed using scanning electron microscopy, and the crystalline phase was studied using X-ray diffraction analysis. Figure 1 shows the template surfaces after chemical deposition of ZnSe. SEM images of the study showed that most of the pores of the template are filled and the chemical precipitation method is excellent for growing with controlled morphology and a high degree of order. It has been established that the filling of nanopores depends on the temperature and deposition time (Fig. 1).

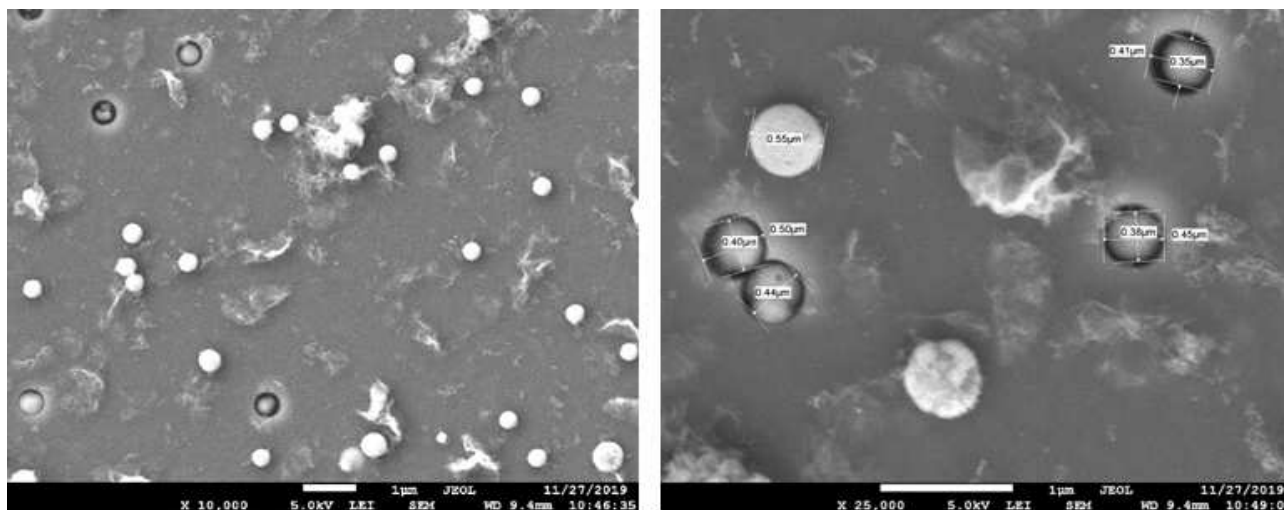


Fig.1. SEM images of the surface after CD of ZnSe for 40 min, at a temperature of  $t = 75^{\circ}\text{C}$ , on average, the nanopore diameter is from 410 nm to 550 nm.

To confirm the obtained ZnSe phase by X-ray diffraction analysis, we performed elemental analysis on a TM3030 scanning electron microscope.

The crystalline phase of the sample is a cubic structure (sphalerite) with space group F-43m. The unit cell parameters are:  $a = 5.592081 \text{ \AA}$  and corresponds with the results of other works. The unit cell parameters obtained by us coincide with the literature data [2]. Thus, in this work, the structural, morphological, and electronic properties of ZnSe nanocrystals of zinc selenide, obtained for the first time by chemical deposition into a-SiO<sub>2</sub>/Si-n track templates, have been studied and characterized.

### REFERENCES

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- [2] A. Continenza, S. Massidda, A. J. Freeman, "Structural and electronic properties of bulk ZnSe", Phys. Rev. B 38, p.12996, 1988.