SEM/EDS AND XRD STUDIES OF Ag-Cd-Se THIN FILMS DEPOSITED ON POLYAMIDE 6

Valentina Krylova[1*], Nijolė Dukštienė[1]

[1] *Department of Physical and Inorganic Chemistry, Kaunas University of Technology, Radvilėnų p1. 9, LT-50254, Kaunas, Lithuania*

** valentina.krylova@ktu.lt*

The last decade have witnessed rapid progress in the field of hybrid nanostructures toward enhanced optical and electronic properties. The cation/anion exchange reactions from pre-synthesized nanostructures is an effective strategy to diversify inorganic-organic semiconductor nanomaterials as it provides reactive capabilities in tuneable composition and property solutions [1]. Recently we have extended cation exchange reaction strategy to inorganic-organic hybrid materials synthesis [2].

In this study, we present a combined CBD-SILAR-CE method which enables us to fabricate Ag-Cd-Se thin films obtained on transparent polyamide 6 surface. The surface morphology and crystal phase structure were examined. The morphological evolution of thin films was performed using a scanning electron microscope JEOL JSM-5500LV equipped with an Energy Dispersive X-ray (EDS) microanalyzer IXRF Systems detector GRESHAM Sirius 10 with an accelerating voltage of 20 kV. The XRD analysis was performed on the Bruker Advance D8 diffractometer, operating at the tube voltage of 40 kV and tube (emission) current of 40 mA.

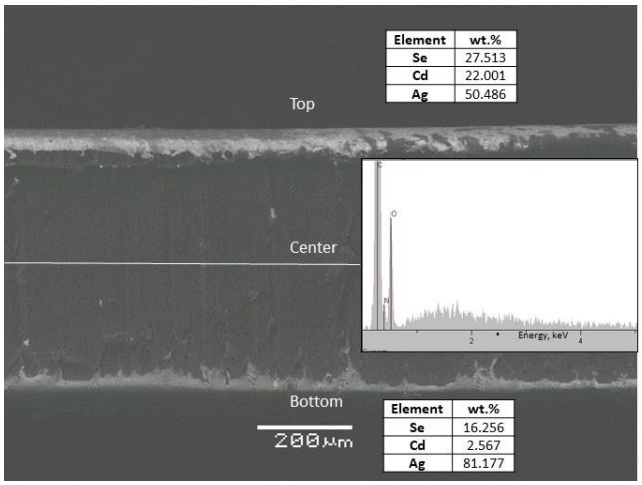

Fig. 1. SEM cross-section, EDS spectra of composite centres and elemental composition of Ag-Cd-Se thin films deposited on polyamide 6 substrate

SEM analysis confirms a very disordered morphology with a non-uniform coverage of different sized clusters. Moreover, EDS spectra analysis clarifies film of different chemical composition on the each side of polyamide (Fig 1.). These results were confirmed by XRD analysis showing a complex Se-CdSe-Ag_2Se film crystalline composition with trigonal Se (JCPDS#71-528), hexagonal CdSe (JCPDS#77-2307), orthorhombic Ag_2Se (JCPDS#24-1041) and Ag (JCPDS#24-1041) peaks.

References

1. J. Zeng, Y. Xia, U. G.D. Moon, Y. Min Jeong, Nano Today, **6** (2011) 186-203.
2. V. Krylova, S. Žalenkienė, N. Dukstienė, J. Baltrusaitis, Appl. Surf. Sci., **351** (2015) 203-208.