Proiect 2– rezultate etapa 2



We report the sol-gel spin coated method applied for preparation of ZnO-P2O5rGO films with 1.0, 1.5 and 2.0% rGO content in precursors 'suspensions. All films presented rice-like grains of ZnO with average dimensions 30-40 nm regardless the concentration of rGO. AFM and SEM morphologic studies were

done. The UV/VIS/NIR transmission spectra indicate high film transparency up to 80% for film deposited on ITO and up to 90% for films deposited on clear

substrate. Spectroscopic ellipsometry method allowed with success the determination of thickness and optical constants of the film deposited on ITO covered glass substrate. The use of Tauc-Lorentz dispersion oscillator for modelling the optical constants was appropriate.



[L. Baschir, D. Savastru, A. A. Popescu, I. C. Vasiliu, M. Filipescu, A.M.Iordache, M. Elisa, S.M.Iordache, O.Buiu, C. Obreja, Journal of Optoelectronics and Advanced Materials, Vol. 21, No. 7-8, 2019, p. 524 – 529]

We report the sol-gel spin coated method applied for preparation of TiO_2rGO and $TiO_2rGOP_2O_5$ films with 0.5, 1.0 and 1.5% rGO content in precursors. Spectroscopic ellipsometry method allowed the determination of thickness and optical constants of the film deposited onto glass substrate. AFM, SEM/EDX and UV-VIS-NIR were performed. H₃PO₄ and rGO concentration in precursors solutions induce an increase in the thickness of the films, a more homogenous



distribution of pores and pore size. The films TiO₂rGOP₂O₅ with 1.5% rGO content in precursors suspension are potential candidate for photocatalytic applications.



[L. Baschir, A.M.Iordache, D. Savastru, A. A. Popescu, I. C. Vasiliu, M. Elisa, C. Obreja, M. Filipescu, R. Trusca and M. Stchakovsky, S. Iordache, approved for publication in Journal of Vacuum Science and Technology: B (JVST: B (Vol.37, Issue 6) DOI:10.1116/1.5122897]



The work is dedicated to the investigation of optical, structural, magnetic and magneto-optical properties of an aluminophosphate glass doped with Dy^{3+} ions, for specific applications as Faraday rotators in the visible spectral domain. The vitreous material belongs to the $16Li_2O-8Al_2O_3-6BaO-60P_2O_5-10Dy_2O_3$ system. Optical homogeneity measured by a polariscopic method, as well as by polarimetry and interferometry revealed an optical quality glass. Time dependent electrical conductance measurements have shown a high chemical strength of the glass. Optical absorption of the doped glass in the visible domain evidenced the specific absorption lines of dysprosium ions, whereas structural

investigations made by FTIR and Raman spectroscopy put in evidence the vitreous network forming role of phosphorous pentoxide. Magnetic and magneto-optical measurements demonstrated paramagnetic features of the doped glass, as well as a Verdet constant of about -0.05 min/Oe/cm at 600 nm wavelength.

[M. Elisa, R. Stefan, I.C. Vasiliu, M.I. Rusu, B.A. Sava, L. Boroica, M. Sofronie, V. Kuncser, A.C. Galca, A. Beldiceanu, A. Volceanov, M. Eftimie, Journal of Non-Crystalline Solids 521 (1 octombrie 2019) 119545, https://doi.org/10.1016/j.jnoncrysol.2019.119545]



metaphosphate structure of the glass together with boron oxide mostly in [BO₃] Q^2 units and also P-O-B bonds. Ultraviolet–visible (UV–Vis) absorbance, photoluminescence (PL), photoluminescence excitation (PLE) and time resolved photoluminescence (TRPL) spectra and luminescence decay curve were investigated systematically. Energy transfer process between Dy³⁺ and Tb³⁺ ions and its influence on luminescent properties were discussed.

[J. F. C. Carreira, B. A. Sava, L. Boroica, M. Elisa, R. Stefan, R. C. C. Monteiro, T. Monteiro, L. Rino[,] Journal of Non-Crystalline Solids 526, 119719, 15 decembrie 2019,

https://doi.org/10.1016/j.jnoncrysol.2019.119719]

A new optical glass with the molar composition 20B₂O₃-50P₂O₅-10Li₂O-9Al₂O₃-5ZnO-3Dy₂O₃-3Tb₂O₃ was obtained by melting-quenching technique comprising wet route raw materials preparation, and the structural and optical characteristics of the glass were investigated by different experimental techniques. The amorphous nature was confirmed by X-ray diffraction (XRD) and the thermal stability was assessed by differential thermal analysis (DTA). Information about the defects of the co-doped glass as well as about the elemental compositional homogeneity was revealed by scanning electron microscopy/energy dispersive spectrometry (SEM/EDS). Structural information provided by Fourier Transform Infrared (FTIR) and Raman spectroscopy indicated

