

**OBTAINING OF CORE-SHELL ZNO NANOPARTICLES ON GLASS SURFACES***Izhyk O. B.*<sup>1</sup>, Holovchuk M. Ya.<sup>2</sup>, Korniy S. A.<sup>2</sup>, Volianiuk K. A.<sup>1</sup>, Balaban O. V.<sup>1</sup>,Mitina N. Ye.<sup>1</sup>, Zaichenko O. S.<sup>1</sup><sup>1</sup>Lviv Polytechnic National University, Lviv, Ukraine<sup>2</sup>Karpenko Physiko-Mechanical Institute of NAS of Ukraine, Lviv, Ukraine

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The fast nucleation rate of the nanoparticles during a synthesis leads to aggregation, loss of desired morphology, and properties. In this case, the usage of stabilizers such as polymer brushes could be useful. After achieving purposeful characteristics of the nanoparticles like size, crystallinity, or dimension we consider their incorporation onto a substrate surface. Incorporation of crystalline nanoparticles onto a surface through chemical bonding is a promising way to functionalize surface with equally distributed particles. Functional polymer brushes possessing reactive sites can be the instrument to do so. In our current work, we investigated a few things: an influence of polymer nature and its concentration on morphology of ZnO nanoparticles (NPs), their size and distribution; an observation of ZnO NPs luminescence ability as a function of synthesis conditions; a surface modification of glass substrate with reactive ZnO core-shell NPs and estimation of their distribution, size, and morphology, after laundering to thinner films. Such techniques as scanning electron microscopy, dynamic light scattering, luminescence spectroscopy, contact angle analysis were used. We found that the concentration of the polymer gives a certain shape and size to nanoparticles as well as affects their luminescence spectrum. In general, quenching of luminescence intensity appears in comparison with unmodified particles. Shapes of particles, nanowires, flakes, or worms were observed. After incorporation of ZnO NPs onto a glass plate and consequent laundering, only a thin film with immobilized crystallites remains. In fact, the size distribution of dispersion in a solvent is different from that on the surface. Large aggregates and microstructures are too large to stay tethered. Surface tension measurements confirm the surface modification and show a strong dependence on polymer nature and concentration. We think that the proposed approach could be useful for applications in energy conversion or storage, and obtaining other nanoparticles and immobilization onto a surface as well.