

Synthesis and characterization of nanoheterostructures based on wide-gap oxides and nanoparticles of chalcogenide semiconductors

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Wide-gap oxide films (ZnO, TiO₂, In₂O₃, SnO₂, etc.) with highly-developed surface sensitized by dye molecules or semiconductor quantum dots are very promising for creation of the third generation of solar cells. In our experiments, the comparative study of nanoheterostructures obtained using *in situ* synthesis of CdS nanoparticles by the successive ionic layer adsorption and reaction technique (SILAR) was done. The films were investigated by SEM, TEM, XRD, BET methods, as well as the UV-Vis and local Raman spectroscopy and complex of photoelectrochemical techniques (photocurrent spectroscopy, voltammetry, etc.). The performed experiments have enabled one to establish and explain both similarities and differences in the properties of the synthesized structures depending on the kind of wide-gap oxide and synthesis method.