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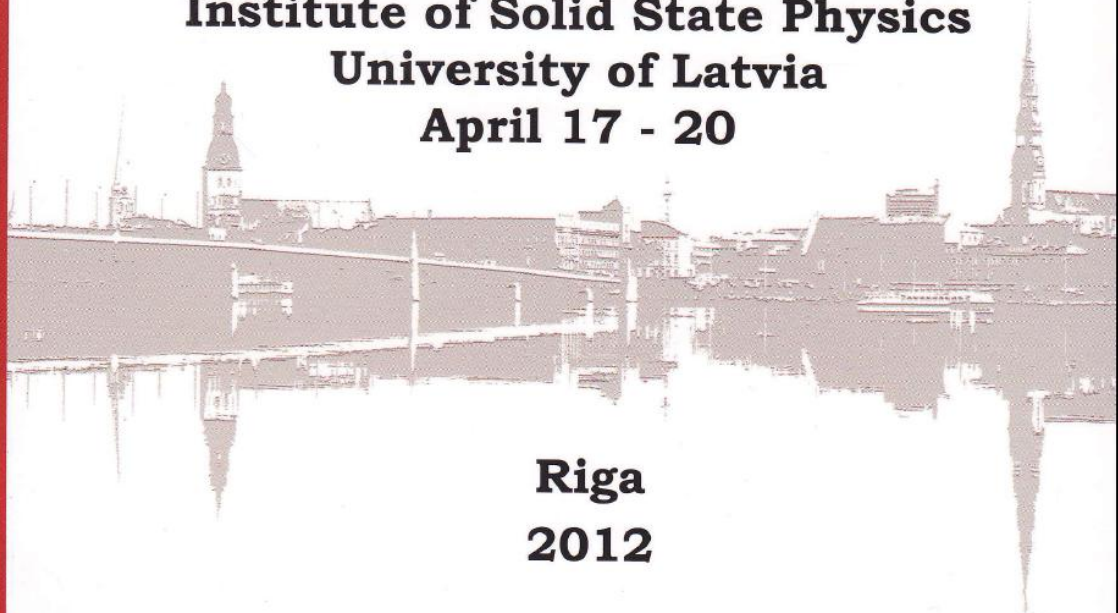

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Light Sensitivity Enchase of TiO_2 Thin Films with Ferrite Nanoparticles Using Multi-source Spray Pyrolysis Method

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Energy crisis is the main stimulus for the design of structurally organized and functionally integrated artificial nanomaterial systems capable of harvesting solar energy. Titanium dioxide (TiO_2) as environmentally friendly and photo-catalytic material is attractive for numerous technological applications: gas sensors, pigments in foodstuffs, paints, cosmetics, in dye solar cells etc. The absorption edge of TiO_2 is in the blue part of visible light; therefore efficiency to solar light is low. $ZnFe_2O_4$ is another catalyst with a relatively small band gap (1.9 eV), which is used as co-catalyst to shift the TiO_2 absorption edge to visible light region of the spectrum, and simultaneously an effective photocatalyst due to its capability of utilizing visible light and good photochemical stability [1].

$ZnFe_2O_4$ nanoparticles obtained by auto-combustion method [2] can be used to synthesize $TiO_2/ZnFe_2O_4$ composites. In our work a spray pyrolysis method was used to obtain well-crystallized $TiO_2/ZnFe_2O_4$ thin films on ITO coated glass substrates heated above 350°C. We used two spray guns to obtain multi-layer $TiO_2/ZnFe_2O_4$ thin film structures. Optical properties and photo-activity of multilayer structures were measured.

Acknowledgements

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