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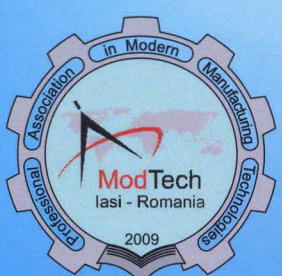
BOOK OF ABSTRACTS



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Keynote Speaker

THE FEASIBILITY OF SOFT CHEMICAL ROUTES IN THE PROCESSING OF HIERARCHICALLY ORGANIZED FUNCTIONAL NANOPARTICLES

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Abstract: Global warming, climate change and natural resources depletion forces tremendou technological and scientifical research activities for the development of next generation of materia able to address both the energy and environmental problems. This implies an exciting progress in th field of nanoscience and nanotechnology, particularly regarding the control synthesis of hierarchicall organised nanoscaled particles that might have a great potential for use in solid-state functiona materials and devices, like phosphors, sensors, photovoltaics, catalysts, drug delivery carriers et Among the diversity of the soft chemical approaches for nanomaterials processing, synthesis throug dispersion phase (aerosol) enables generation of ultrafine, either single or complex powders wit controlled stoichiometry, chemical and phase content provided by high heating and cooling rates, shor residence time and high surface reaction and is here demonstrated for the synthesis of spherical three dimensional (3D), hierarchically organized nanostructured particles with uniformly distribute components and phases. The particles composite inner structure, representing an assembly o nanosized primary particles, opens the possibility for particle surface modification an functionalization emphasizing their application in photovoltaics, energy transfer and bioimaging When one-dimensional (1D) nanomaterials are considered, the hydrothermal method (HT) is shown t be one of the simplest techniques for their obtaining. With the help of various analyzing technique like XRPD, SEM/EDS, FE-SEM, TEM, HR-TEM, STEM, nanotomography, UV-Vis diffusiv reflectance (UV-Vis DRS), Fourier transform infrared (FTIR) spectroscopy and luminescenc measurements, the opportunities of both methods for the synthesis of novel functional materials base on Gd_2O_3:Eu, Y_2O_3:Eu,Yb,Er,Ho,Tm, $(Y_{1-x}Gd_x)_2O_3$:Eu, $Y_3Al_5O_{12}$:Ce, $NaYF_4$, TiO_2 etc. for solvin energy/environmental problems will be reviewed. The obtained results offer a general route for th synthesis of hierarchical nanomaterials with tunable structure, morphology and optical properties.

Key words: feasibility, nanoparticles.