

SEMINAR FIZIČKOG ODSJEKA

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NONAQUEOUS SYNTHESIS AND CHARACTERIZATION OF METAL OXIDE NANOPARTICLES

Igor Djerdj

Max Planck Institute of Colloids and Interfaces (MPIKGF),

Research Campus Golm, Potsdam 14424, Germany

Department of Physics, Faculty of Science, University of Zagreb,

Bijenička 32 P.O. Box 331, 10002 Zagreb, Croatia

Nonaqueous solution routes to metal oxide nanoparticles are a valuable alternative to the well-known aqueous sol-gel processes, offering advantages such as high crystallinity at low temperatures, robust synthesis parameters and ability to control the crystal growth without the use of surfactants.

The talk will present the synthesis of crystalline metal oxide nanoparticles based on nonaqueous soft-chemistry routes involving the reaction of metal oxide precursors such as metal halides, alkoxides or acetylacetonates with organic solvents like benzyl alcohol, benzylamine or various ketones. Control over particle size and shape is achieved solely by the solvent without any additional structure-directing agents. This synthesis methodology enables the preparation of a large variety of binary as well as ternary metal oxides on the nanoscale, often with crystallite sizes well below 10 nm. Furthermore, the simultaneous use of two or more chemically different precursors allows the controlled preparation of doped metal oxide nanoparticles, thus providing a powerful tool to tailor the chemical as well as the physical properties. As an illustrative example the synthesis of $\text{La}(\text{OH})_3$ nanoparticles as well as Mn-O nanoparticles will be presented.

Voditelj seminara FO

Hrvoje Buljan, hbuljan@phy.hr