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Einladung zu einem ausserordentlichen LES Palaver

Referentin: Kerda Keevend, Institute of Physics, University of Tartu, Estonia

Thema: Microwave-hydrothermal synthesis of water-dispersible luminescent nanoparticles of yttrium phosphates and fluorides doped with Nd³⁺ ion

Zeit: Montag, 21. Dezember 2015, 09.00

Ort: Sitzungszimmer OHL D/011

Abstract

The current talk is based on the recently published Master thesis. Our group synthesized and studied water-dispersible Nd³⁺ doped nanoparticles for bioimaging. We synthesized luminescent nanoparticles of yttrium phosphates and fluorides doped with Nd³⁺ ion using a microwave-hydrothermal method. As a first step, we studied the influence of synthesis conditions during the crystallization of freshly precipitated gels on the phase composition and morphology of Nd³⁺ doped nanoparticles, while monitoring the conditions including pH, temperature, reagents concentration, and surfactant concentration. As a result, we developed a synthetic procedure for obtaining water-dispersible, highly crystalline and small luminescent nanoparticles. We show that phase composition, water content, and morphology strongly affect the luminescent properties of obtained particles. To study the luminescent properties we performed site-selective spectroscopy and analyzed static (Direct Energy Transfer, DET) Förster kinetics of impurity quenching $N(t)$. As a result we revealed structural origins of fluorescence quenching in synthesized nanoparticles and evaluate their suitability for novel fluorescent markers.

Freundliche Grüsse
E. Wieland