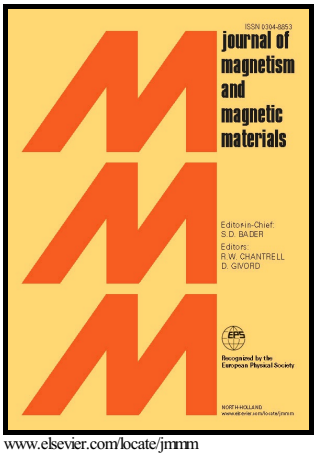

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Atomic Layer Deposition of Titanium Oxide Films on As-Synthesized Magnetic Ni Particles: Magnetic and Safety Properties

Peep Uudeküll[1], Jekaterina Kozlova[1], Hugo Mändar[1], Joosep Link[3], Mariliis Sihtmäe[2], Sandra Käosaar[2,4], Irina Blinova[2], Kaja Kasemets[2], Anne Kahru[2], Raivo Stern[3], Tanel Tätte[1], Kaupo Kukli[1,5], Aile Tamm[1]

[1]*Institute of Physics, University of Tartu, W. Ostwaldi Str.1, 50411 Tartu, Estonia*

[2]*Laboratory of Environmental Toxicology, National Institute of Chemical Physics and Biophysics, Akadeemia tee 23, 12618 Tallinn, Estonia*

[3]*Laboratory of Chemical Physics, National Institute of Chemical Physics and Biophysics, Akadeemia tee 23, 12618 Tallinn, Estonia*

[4]*Faculty of Chemical and Materials Technology, Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia*

[5]*University of Helsinki, Department of Chemistry, P.O.Box 55, FI-00014 Helsinki, Finland*

E-mail: peep.uudekull@ut.ee

Abstract

Spherical nickel particles with size in the range of 100-400 nm were synthesized by non-aqueous liquid phase benzyl alcohol method. Being developed for magnetically guided biomedical applications, the particles were coated by conformal and antimicrobial thin titanium oxide films by atomic layer deposition. The particles retained their size and crystal structure after the deposition of oxide films. The sensitivity of the coated particles to external magnetic fields was increased compared to that of the uncoated powder. Preliminary toxicological investigations on microbial cells and small aquatic crustaceans revealed non-toxic nature of the synthesized particles.

Keywords: Nickel mesoparticles; atomic layer deposition (ALD); titanium dioxide coatings; magnetical characterization; safety