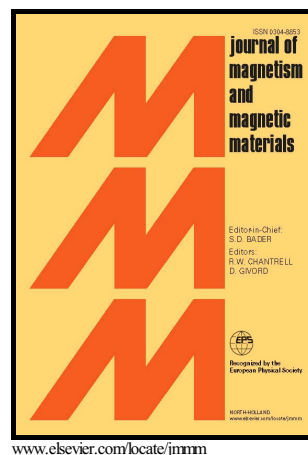


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Atomic Layer Deposition of Titanium Oxide Films on As-Synthesized Magnetic Ni Particles: Magnetic and Safety Properties

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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

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