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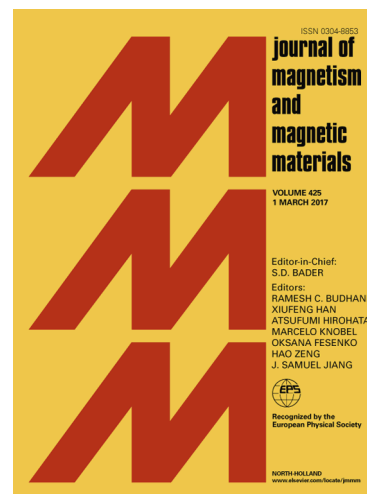
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Impact of thermal oxidation on chemical composition and magnetic properties of iron nanoparticles

Marcin Krajewski ^{a,*}, Katarzyna Brzozka ^b, Mateusz Tokarczyk ^c, Grzegorz Kowalski ^c, Sabina Lewinska ^d, Anna Slawska-Waniewska ^d, Wei Syuan Lin ^e, Hong Ming Lin ^e

^a Institute of Fundamental Technological Research, Polish Academy of Sciences, Pawinskiego 5B, 02-106 Warsaw, Poland

^b Faculty of Mechanical Engineering, Department of Physics, University of Technology and Humanities in Radom, Krasickiego 54, 26-600 Radom, Poland

^c Faculty of Physics, Institute of Experimental Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland

^d Polish Academy of Sciences, Institute of Physics, Al. Lotnikow 32/46, 02-668 Warsaw, Poland

^e Department of Materials Engineering, Tatung University, Taipei, 104, Taiwan, ROC

* Corresponding author: mkraj@ippt.pan.pl

Abstract

The main objective of this work is to study the influence of thermal oxidation on the chemical composition and magnetic properties of iron nanoparticles which were manufactured in a simple chemical reduction of Fe³⁺ ions coming from iron salt with sodium borohydride. The annealing processing was performed in an argon atmosphere containing the traces of oxygen to avoid spontaneous oxidation of iron at temperatures ranging from 200 °C to 800 °C. The chemical composition and magnetic properties of as-prepared and thermally-treated nanoparticles were determined by means of X-ray diffractometry, Raman spectroscopy, Mössbauer spectroscopy and vibrating sample magnetometry. Due to the magnetic interactions, the investigated iron nanoparticles tended to create the dense aggregates which

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