



Mössbauer study of AFe_2O_4 (A = Mn, Fe, and Co) nanoparticles for biomedical applications

Published: 08 June 2023

Volume 332, pages 5127–5133, (2023) [Cite this article](#)

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Abstract

The crystallographic and magnetic properties of AFe_2O_4 (A = Mn, Fe, and Co) nanoparticles have been studied for biomedical applications. The powders are prepared by the high thermal temperature decomposition method, and the structural and magnetic properties of the samples are investigated by X-ray diffraction, Vibrating sample magnetometry, and Mössbauer spectroscopy. The crystal structure of the AFe_2O_4 was a single-phase cubic spinel ($Fd-3m$). LDH assay was performed to investigate the cytotoxicity of synthesized nanoparticles. In addition, it was confirmed that the magnetic properties did not change even though when the biodegradable polymer (poly(L-lactic acid)) was coated on $MnFe_2O_4$ nanoparticles, which seemed to be most suitable for thermal therapy, for the purpose of improving biocompatibility.