



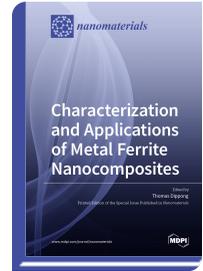
*Special Issue Reprint*

## Characterization and Applications of Metal Ferrite Nanocomposites

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Edited by  
Thomas Dippong

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This Special Issue focuses on ferrite-based nanomaterial synthesis and characterization including (i) Synthesis, (ii) Advanced chemical and physical characterization of structure and properties, (iii) Magnetic behaviour, (iv) Computational and theoretical studies of reaction mechanisms, kinetics, and thermodynamics, (v) Applications of nanomaterials in environmental, biological, catalytic, medical, cultural heritage, food, geochemical, polymer, and materials science.

Additionally, the effect of reaction time, reaction temperature, and oleic acid concentration on the properties of  $\text{CoFe}_2\text{O}_4$  nanoparticles was investigated. In this Special Issue, the effect of  $\text{SiO}_2$  embedding on the production of single-phase ferrites, as well as on the structure, morphology and magnetic properties of  $(\text{Zn}_{0.6}\text{Mn}_{0.4}\text{Fe}_2\text{O}_4)_\delta(\text{SiO}_2)_{100-\delta}$  ( $\delta = 0-100\%$ ) NPs, synthesized by the sol-gel method and annealed at different temperatures, is analysed. The obtained results indicated that the preparation route strongly influences the particle sizes and, implicitly, the magnetic behaviour of the NPs. The  $\text{Zn}_{0.6}\text{Mn}_{0.4}\text{Fe}_2\text{O}_4$  embedded in  $\text{SiO}_2$  exhibits superparamagnetic-like behaviour, whereas the unembedded  $\text{Zn}_{0.6}\text{Mn}_{0.4}\text{Fe}_2\text{O}_4$  behaves similar to a high-quality ferrimagnet. It also includes the study on  $\text{Bi}_2\text{Cu}(\text{C}_2\text{O}_4)_4 \cdot 0.25\text{H}_2\text{O}$  synthesis by thermolysis, followed by its integration within a CuBi/carbon nanofiber (CNF) paste electrode and its application in electrochemical detection of amoxicillin (AMX) in aqueous solution. By adding a concentration step in the detection protocol, selective and simultaneous detection of AMX in a multi-component matrix is also possible.



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