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Tuning the properties of magnetic nanocomposites via composition, synthesis method, and annealing

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Ferrite nanoparticles are promising materials for biomedical applications, including magnetic hyperthermia in cancer treatment. The nanoparticles can be embedded in silica to enhance their biocompatibility and chemical stability. Depending on the process and conditions used, nanocomposites of varied morphologies – and consequently, diverse magnetic properties – can be obtained [1,2].

In our research, we employed diffraction, microscopic, and spectroscopic techniques – including synchrotron-based methods – to investigate how the synthesis parameters, elemental composition, and annealing conditions influence the structural, electronic, and magnetic properties of the obtained nanocomposites.

By advancing the understanding of magnetic nanocomposites, our results may contribute to the development of more efficient materials for magnetic hyperthermia.

References

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