

Supplementary information

Crystal chemistry and single-phase synthesis with higher solubility of Gd³⁺ in Co-Zn ferrite nanoparticles for their enhanced magnetic properties

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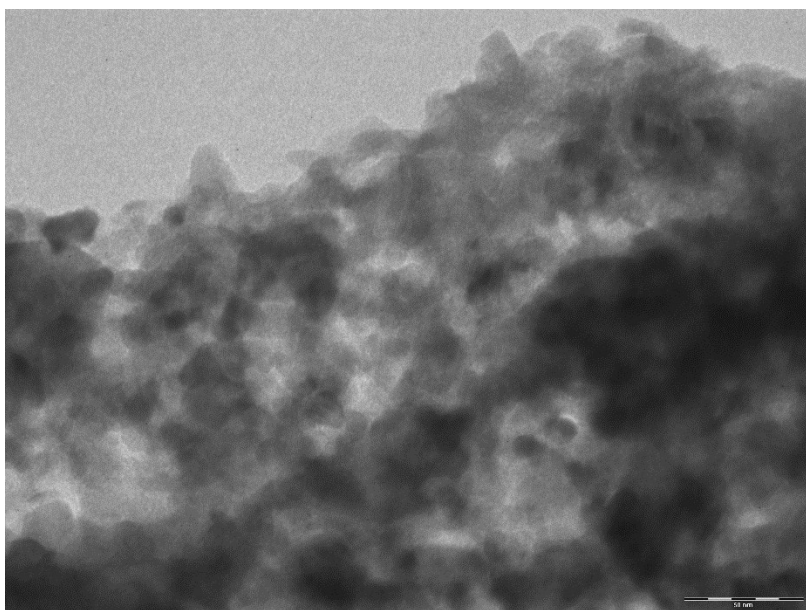
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Rietveld refinement:

Program refinement of the first samples was started with the space group Fd3m, origin at -3 m, O in 32e-, A-site in 8f and B-site in 16c. In the first step the global parameters, such as 2 θ -zero and background, were refined. In the next step, the structural parameters such as lattice parameter, atomic coordinates, and site occupancy, were refined. The fitting quality of the experimental data were checked by using the following parameters: the goodness of fit, χ^2 ; that must tend to one and two reliability factors, R_{exp} and R_{wp} (weighted differences between measured and calculated values) that must be close to or less than 10%.



Supplementary Fig. 1: TEM images of typical samples ($x = 0.1$) of $\text{Co}_{0.7}\text{Zn}_{0.3}\text{Gd}_x\text{Fe}_{2-x}\text{O}_4$.