

The x-ray diffraction pattern recorded for the iron oxide nanoparticles isolated before functionalization with MOEEAA or citrate is shown in Figure 1. Although the co-precipitation method employed to prepare the particles has been previously reported to yield maghemite (γ -Fe₂O₃),¹ the possibility of obtaining mixtures containing residual magnetite (Fe₃O₄) has also been noted.² Known x-ray diffraction patterns³ for γ -Fe₂O₃ and Fe₃O₄ are thus also shown in Figure 1 for comparison. The position and relative intensities of the diffraction peaks reported in Table 1 indeed indicate that it is very difficult to distinguish between the two forms by this method. Given the oxidizing conditions used in particle preparation, it can be assumed that maghemite (γ -Fe₂O₃) is primarily obtained, but the possibility of residual magnetite remaining in the core of the particles cannot be excluded.

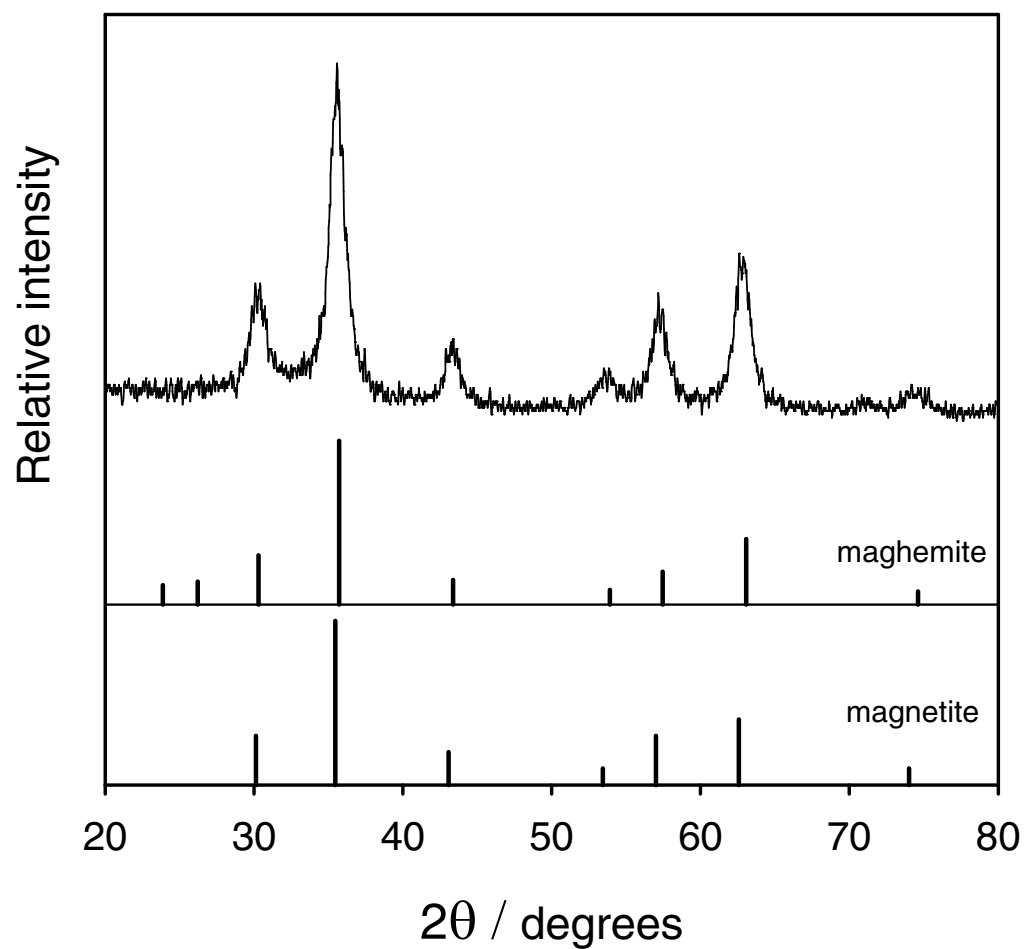


Figure 1. X-ray diffraction pattern of synthesized iron oxide nanoparticles compared to literature data³ for maghemite (γ -Fe₂O₃) and magnetite (Fe₃O₄).

Literature data ³					
$\gamma\text{-Fe}_2\text{O}_3$		Fe_3O_4		Experimental data	
$2\theta^\circ$	I	$2\theta^\circ$	I	$2\theta^\circ$	I
23.86	12	-	-	-	-
26.21	14	-	-	-	-
30.29	30	30.12	30	30.24	34
35.72	100	35.45	100	35.60	100
43.38	15	43.06	20	43.39	22
53.90	9	53.44	10	53.52	13
57.45	20	56.99	30	57.16	35
63.07	40	62.57	40	62.80	47
74.61	8	74.02	10	74.16	10

Table 1. X-ray diffraction data for maghemite ($\gamma\text{-Fe}_2\text{O}_3$), magnetite (Fe_3O_4) and the iron oxide nanoparticles obtained in this study.

(1) Bee, A.; Massart, R.; Neveu, S. *J. Magn. Magn. Mater.* **1995**, *149*, 6.

(2) Maity, D.; Agrawal, D. C. *J. Magn. Magn. Mater.* **2007**, *308*, 46.

(3) Cornell, R. M.; Schertmann, U. *The Iron Oxides: Structure, Properties, Reactions, Occurrence and Uses*, VCH Publishers, Weinheim, 2003.