

Supplementary Information

Magnetic and Impedance Analysis of Fe₂O₃ Nanoparticles for Chemical Warfare Agent Sensing Applications

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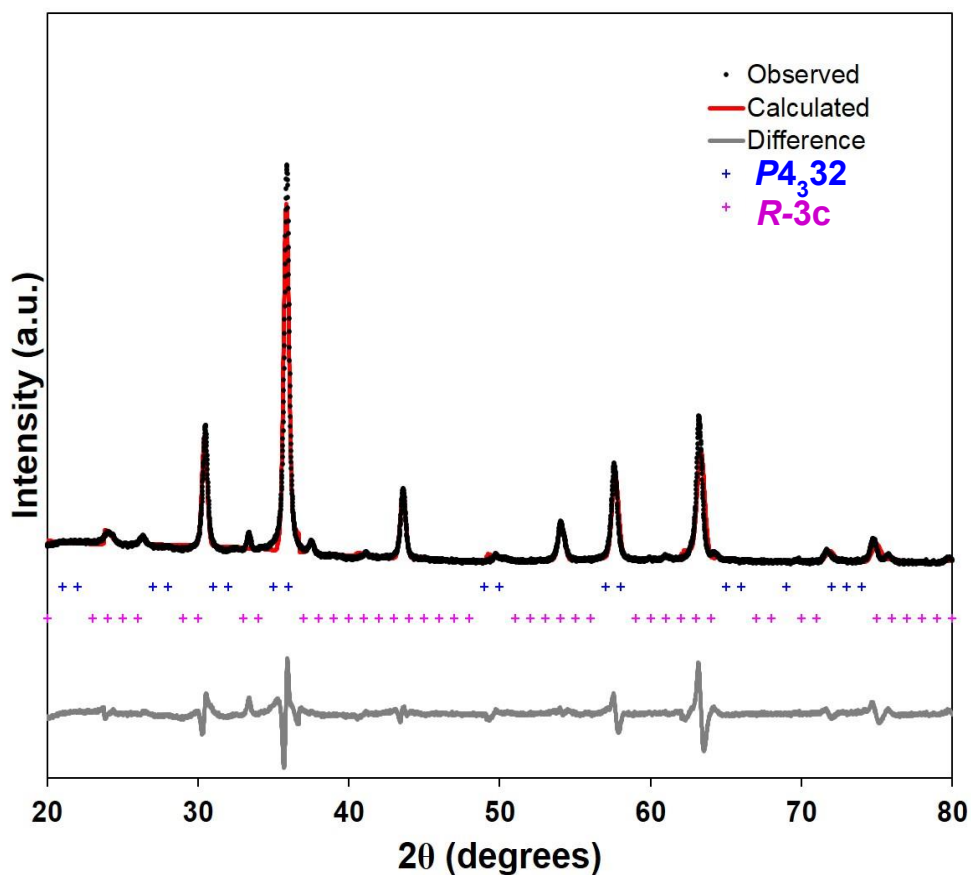


Figure S1. X-ray powder diffraction pattern of Fe_2O_3 nanoparticles in 2θ range of 20 to 80 degrees. The black filled circles, red line, gray line, blue crosses, and pink crosses are the observed pattern, calculated pattern, difference curve between the observed and calculated curves, allowed Miller indices for space group $P4_332$, and allowed Miller indices for space group $R-3c$, respectively.

Table S1. Lattice parameters, atomic positions, weight fractions, crystallite size, and R_F^2 factor from X-ray powder diffraction Rietveld refinement.

	$\alpha\text{-Fe}_2\text{O}_3$	$\gamma\text{-Fe}_2\text{O}_3$
Space Group	$R\text{-}\bar{3}c$	$P4_332$
Lattice parameters		
a (Å)	4.989(3)	8.3058(2)
c (Å)	13.74(1)	-
Atomic positions		
Fe1, x	0	$\frac{1}{8}$
y	0	0.3658(8)
z	0.367(2)	0.8842(8)
Fe2, x		$\frac{5}{8}$
y		$\frac{5}{8}$
z		$\frac{5}{8}$
Fe3, x		1.001(1)
y		1.001(1)
z		1.001(1)
O1, x	0.18(1)	0.865(4)
y	0	0.865(4)
z	$\frac{1}{4}$	0.865(4)
O2, x		0.119(4)
y		0.122(4)
z		0.380(4)
Wt. Fractions	0.091(4)	0.9090(6)
Crystallite size (nm)		23
R_F^2		0.1461