Electronic Supplementary Material (ESI) for Dalton Transactions.

EDTA-Na_3 Functionalized Fe_3O_4 Nanoparticles: Grafting Density Control for MRSA Eradication

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Supporting Information Available

Fit results of Mössbauer spectra

A) The detailed fit results of the Mössbauer spectra (velocity scale: ∼2.8 mm/s) of the Fe_3O_4-EDTA-Na_3 nanoparticles are tabulated below.

Table 1: The isomer shift (δ), quadrupole shift (Δ), lorentzian linewidth (Γ, FWHM) and relative spectral area of the EDTA-Na_3 coated and as-synthesized nanoparticles obtained from the fits of the Mössbauer spectra.

Sample	δ (mm/s)	Δ (mm/s)	Γ (mm/s)	Area (%)	Phases
without EDTA-Na_3	0.42±0.01	2.72±0.01	0.19±0.01	100	Fe_3O_4 core
	0.50±0.01	2.04±0.01	0.19±0.01		
4 hr	0.42±0.01	2.72±0.01	0.19±0.01	56	Fe_3O_4 core
	0.50±0.01	2.04±0.01	0.19±0.01		
	0.36±0.01	0.73±0.01	0.40±0.14	37	Fe-EDTA monomer
	0.31±0.02	2.29±0.05	0.35±0.09	7	Fe-EDTA dimer
3 hr	0.42±0.01	2.72±0.01	0.19±0.01	37	Fe_3O_4 core
	0.50±0.01	2.04±0.01	0.19±0.01		
	0.36±0.01	0.70±0.01	0.38±0.12	57	Fe-EDTA monomer
	0.26±0.04	2.08±0.05	0.35±0.09	6	Fe-EDTA dimer
2 hr	0.42±0.01	2.72±0.01	0.19±0.01	40	Fe_3O_4 core
	0.50±0.01	2.04±0.01	0.19±0.01		
	0.36±0.01	0.72±0.01	0.42±0.16	54	Fe-EDTA monomer
	0.26±0.05	2.06±0.03	0.32±0.07	6	Fe-EDTA dimer
1 hr	0.42±0.01	2.72±0.01	0.19±0.01	6	Fe_3O_4 core
	0.50±0.01	2.04±0.01	0.19±0.01		
	0.37±0.01	0.71±0.01	0.39±0.13	71	Fe-EDTA monomer
	0.35±0.02	1.83±0.06	0.54±0.28	23	Fe-EDTA dimer
25 min	0.42±0.01	2.72±0.01	0.19±0.01	1	Fe_3O_4 core
	0.50±0.01	2.04±0.01	0.19±0.01		
	0.37±0.01	0.69±0.01	0.37±0.11	85	Fe-EDTA monomer
	0.42±0.03	1.68±0.10	0.45±0.19	14	Fe-EDTA dimer

B) The hyperfine parameters of the as synthesized Fe_3O_4 nanoparticle (velocity scale: $\sim$11 mm/s) are given below:

Table 2: Hyperfine field (B_{hf}), isomer shift (δ), lorenzian linewidth (Γ), and area ratio of the A and B site components of the as synthesized Fe_3O_4 nanoparticles.

	B_{hf} (T)	δ (mm s^{-1})	Γ (mm s^{-1})	Area (%)
A	48.9±0.3	0.32±0.01	0.24±0.01	57.0±4.2
B	45.2±0.6	0.60±0.01	0.34±0.01	43.0±3.6