Electronic Supplementary Material (ESI) for CrystEngComm.

Supplementary Materials

Humic acids-modified mesoporous silica encapsulating magnetite: crystal and surface characteristics

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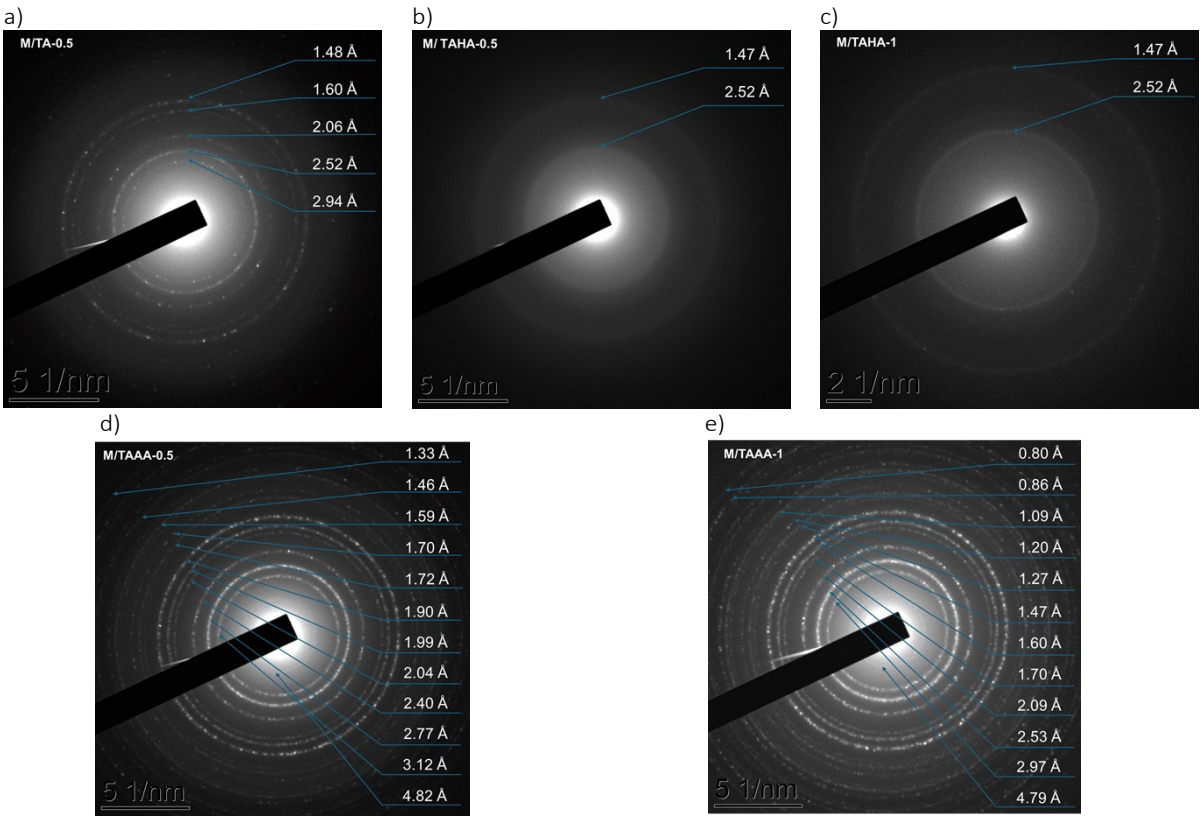
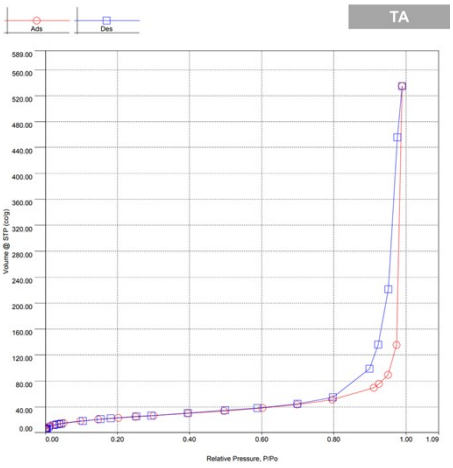


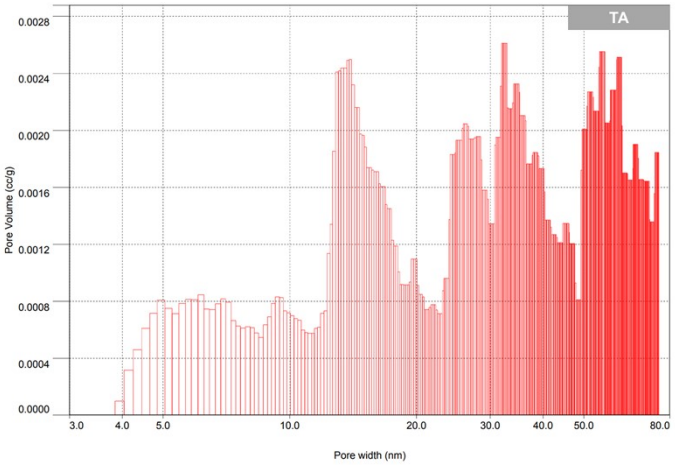
Fig. S1. Electron diffraction patterns of M/TA-0.5 (a), M/TAHA-0.5 (b), M/TAHA-1 (c), M/TAAA-0.5 (d) and M/TAAA-1 (e)

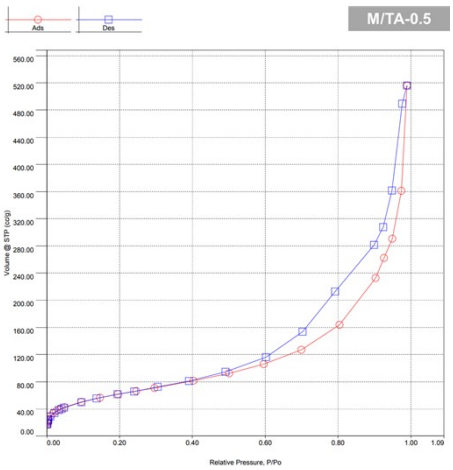
Table S1. Results of analysis of the phase composition of samples.

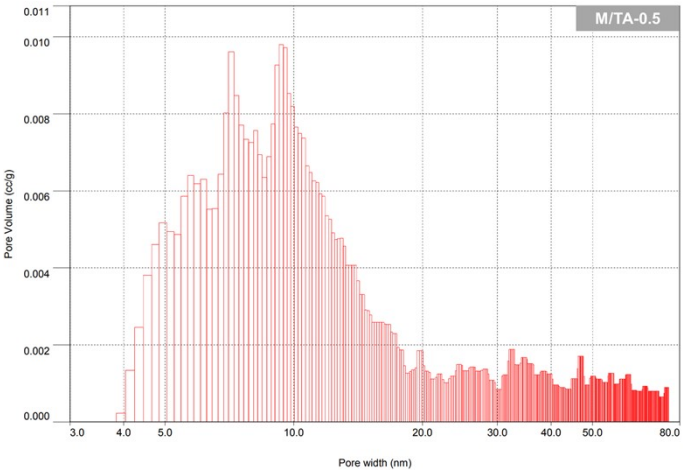
Sample	Interplanar spacing d, Å	h	k	l	Composition
M/TA-0.5	2.94 Å	2	2	0	γ-Fe_2O_3 [amcsd 0020517]
	2.52 Å	3	1	1	Fe_3O_4 [amcsd 0002400]
	2.06 Å	5	0	1	β-FeOOH [amcsd 000307]
	1.60 Å	2	3	1	α-FeOOH [amcsd 0010471]
	1.48 Å	4	4	0	Fe_3O_4 [amcsd 0002400]
M/TAHA-0.5	2.52 Å	3	1	1	Fe_3O_4 [amcsd 0002400]
	1.47 Å	1	1	0	$5Fe_2O_3{\cdot}9H_2O$ [amcsd 0012029]
M/TAHA-1	2.52 Å	3	1	1	Fe_3O_4 [amcsd 0002400]
	1.47 Å	1	1	0	$5Fe_2O_3{\cdot}9H_2O$ [amcsd 0012029]
M/TAAA-0.5	4.82 Å	1	1	1	γ-Fe_2O_3 [amcsd 0020517]
	3.12 Å				Not identified
	2.77 Å	2	2	1	γ-Fe_2O_3 [amcsd 0020517]
	2.40 Å	2	2	2	γ-Fe_2O_3 [amcsd 0020517]
	2.04 Å	1	0	5	β-FeOOH [amcsd 000307]
	1.99 Å	1	3	1	α-FeOOH [amcsd 0010471]

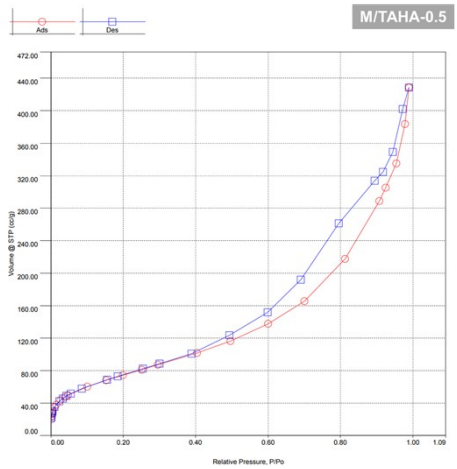
	1.90 Å	0	4	1	α-FeOOH [amcsd 0010471]
	1.72 Å	1	0	4	$5Fe_2O_3·9H_2O$ [amcsd 0012029]
	1.70 Å	4	2	2	γ-Fe_2O_3 [amcsd 0020517]
	1.59 Å	0	1	8	α-Fe_2O_3 [amcsd 0021166]
	1.46 Å	-4	0	6	β-FeOOH [amcsd 000307]
	1.33 Å	6	2	0	Fe_3O_4 [amcsd 0002400]
M/TAAA-1	4.79 Å	1	1	1	γ-Fe_2O_3 [amcsd 0020517]
	2.97 Å	2	2	0	Fe_3O_4 [amcsd 0002400]
	2.53 Å	3	1	1	Fe_3O_4 [amcsd 0002400]
	2.09 Å	4	0	0	Fe_3O_4 [amcsd 0002400]
	1.70 Å	4	2	2	γ-Fe_2O_3 [amcsd 0020517]
	1.60 Å	5	1	1	γ-Fe_2O_3 [amcsd 0020517]
	1.47 Å	1	1	0	$5Fe_2O_3·9H_2O$ [amcsd 0012029]
	1.27 Å	5	3	3	γ-Fe_2O_3 [amcsd 0020517]
	1.20 Å	4	4	4	γ-Fe_2O_3 [amcsd 0020517]
	1.09 Å	2	2	6	Fe_3O_4 [amcsd 0002400]
	0.86 Å				Not identified
	0.80 Å				Not identified

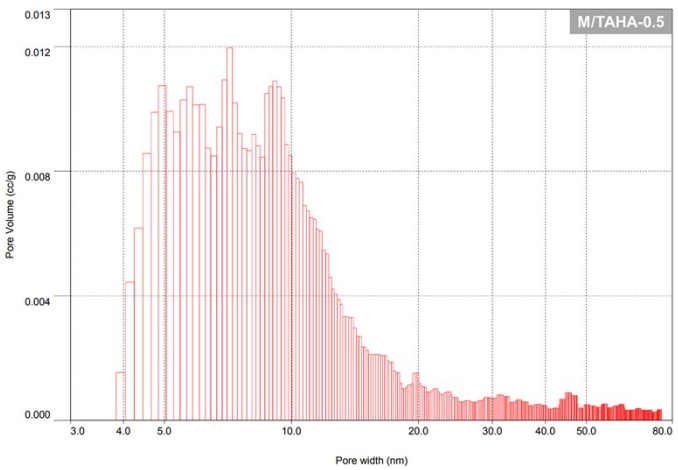


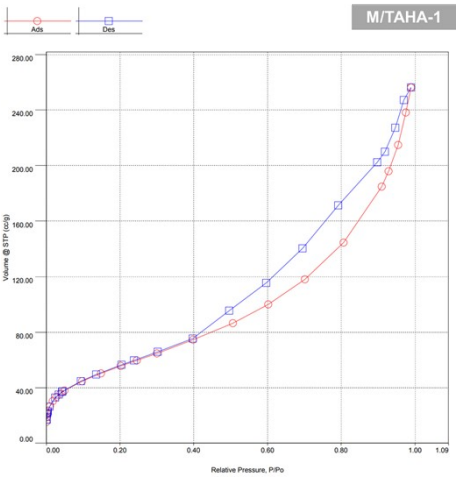


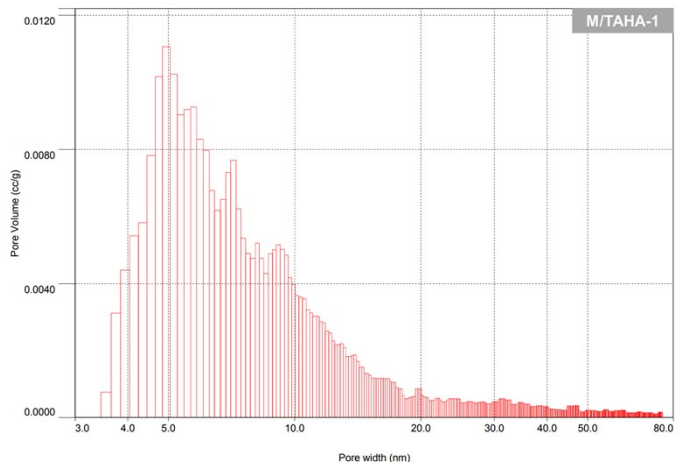


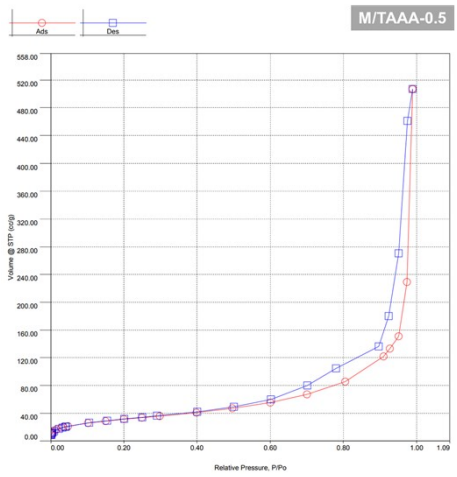


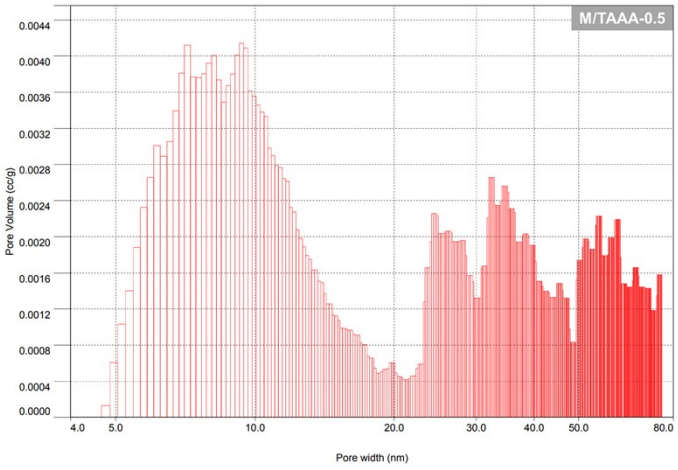

M/TAHA-0.5
Ads
Des
Volume @ STP (cc/g)
Relative Pressure, P/Po


M/TAHA-0.5
Pore Volume (cc/g)
Pore width (nm)


M/TAHA-1
Ads
Des
Volume @ STP (cc/g)
Relative Pressure, P/Po


M/TAHA-1
Pore Volume (cc/g)
Pore width (nm)


M/TAAA-0.5
Ads
Des
Volume @ STP (cc/g)
Relative Pressure, P/Po


M/TAAA-0.5
Pore Volume (cc/g)
Pore width (nm)

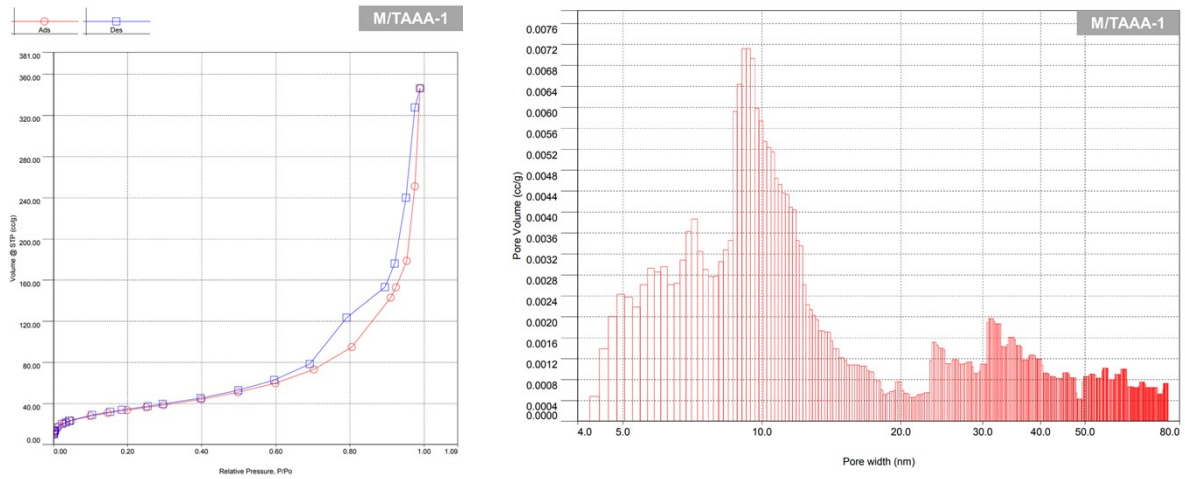


Fig. S2. Isotherms of nitrogen adsorption/desorption of samples at low temperature (77 K) and histograms of pore size distribution

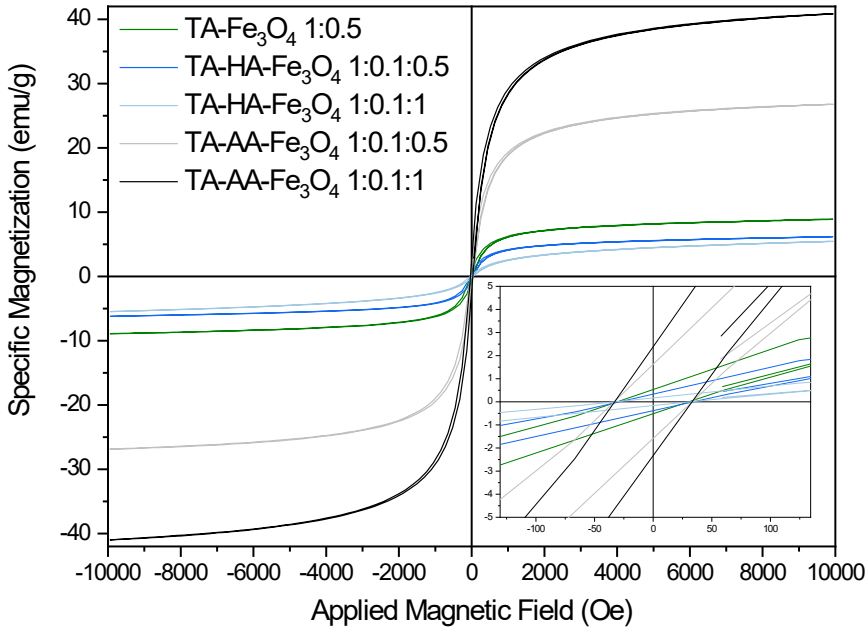


Fig. S3. Magnetization curves for the powders of samples at 300 K

Table S2. Magnetic properties of obtained nanoparticle NPs.

Sample	Ms (emu/g)	Mr, (emu/g)	H_c, (Oe)
Fe_3O_4	31,5	2,0	39,5
TA-Fe_3O_4 (1:0.5)	8,91	0,52	30,6
TA-HA-Fe_3O_4 (1:0.1:0.5)	6,18	0,33	29,8
TA-HA-Fe_3O_4 (1:0.1:1)	5,50	1,67	31,9
TA-AA-Fe_3O_4 (1:0.1:0.5)	26,8	1,61	33,4
TA-AA-Fe_3O_4 (1:0.1:1)	40,8	2,36	33,2