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ARTICLE TYPE

Sandwich-structured Fe_2O_3@SiO_2@Au nanoparticles with magnetoplasmonic responses

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Electronic Supplementary material

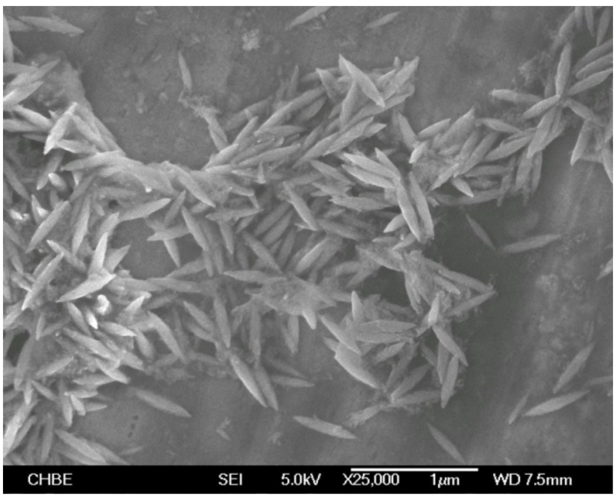
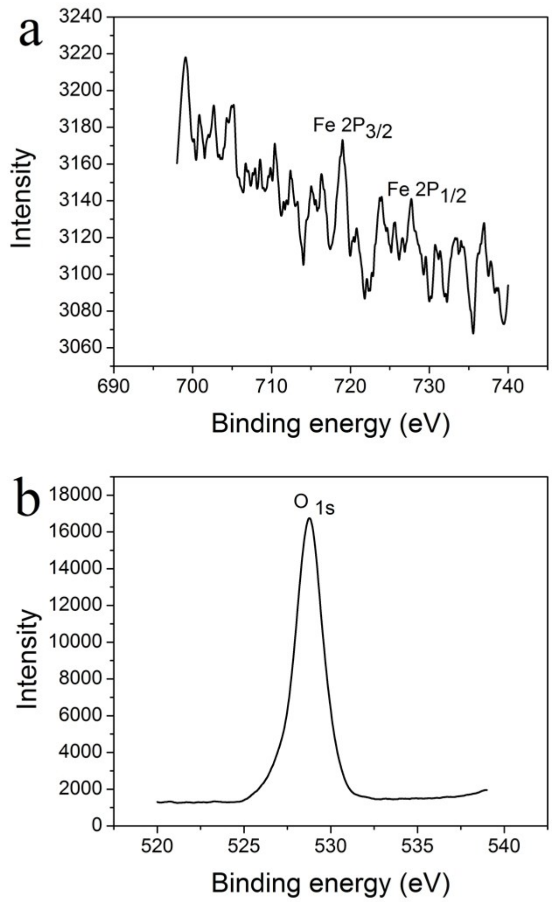


Fig. S1 SEM image of relatively monodisperse α-Fe_2O_3 NPs with an aspect ratio of 6 fabricated via the forced hydrolysis method.

Table S1. The average size and size distribution of α-Fe_2O_3 NPs

Aspect ratio	R(σ)	Length (σ) (nm)	Polydispersity of Length (%)	Width(σ) (nm)	Polydispersity of Width (%)
3		178.5 (3.2)	1.8%	59.3 (2.9)	4.9%
4		192.4 (3.9)	2.0%	48.8 (2.1)	4.3%
6		218.1(4.0)	1.8%	36.6 (2.2)	6%
9		270.1 (10.0)	3.7%	30.0 (1.4)	4.7%



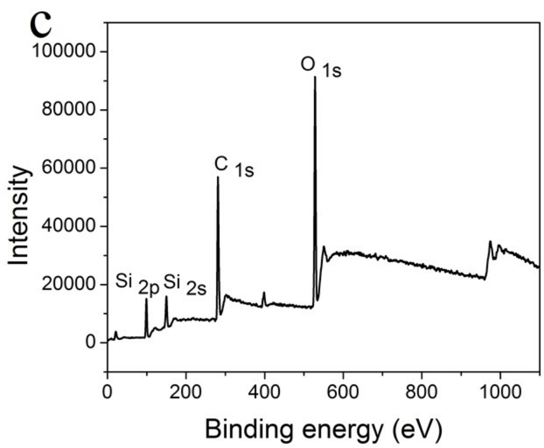


Fig. S2 XPS spectra of α-Fe_2O_3@SiO_2 NPs: (a) Fe 2p, (b) O 1s and (c) survey scan. The α-Fe_2O_3@SiO_2 NPs shows relatively weak Fe $2p_{1/2}$ and $2p_{3/2}$ peaks (Figure S2a). This is caused by the coating of SiO_2 on the surface of α-Fe_2O_3 NPs. The XPS spectra confirmed the existence of Fe_2O_3@SiO_2.

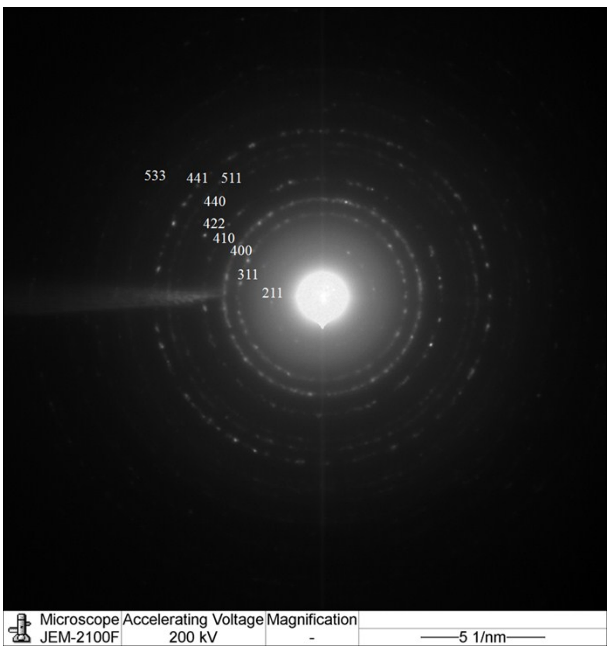


Fig. S3 Electron diffraction patterns of γ-Fe_2O_3@SiO_2.

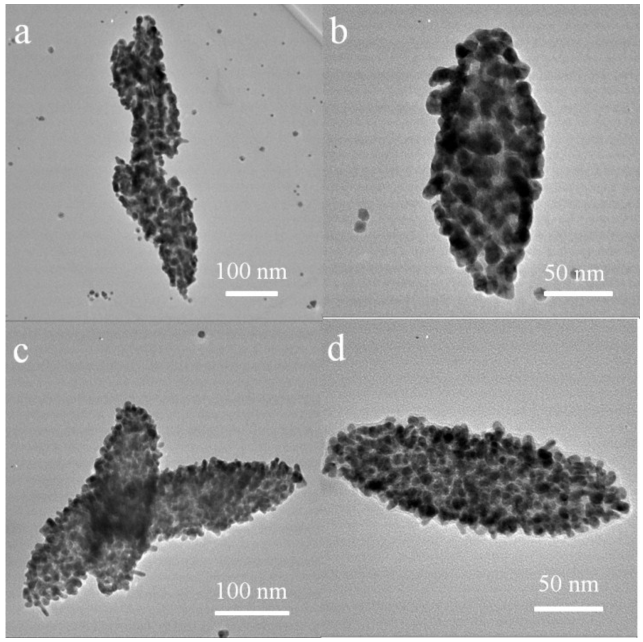


Fig. S4 TEM images of Fe_2O_3@Au NPs with aspect ratios (a-b) 3 and (c-d) 4, respectively.

We took photographs of γ-Fe_2O_3@SiO_2@Au NPs solution before and after adsorption and separation by a magnet. As shown below, the clear solution obtained after the separation by a magnet, indicating the magnetic property of γ-Fe_2O_3@SiO_2@Au NPs.

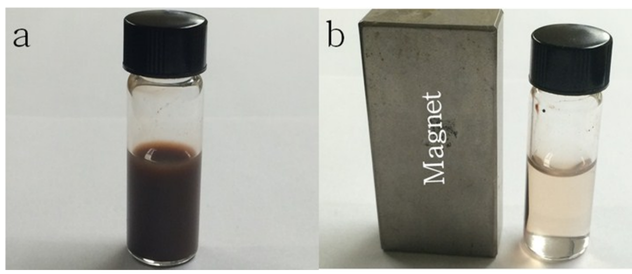


Fig. S5 γ-Fe_2O_3@SiO_2@Au NPs solution (a) before and (b) after adsorption and separation by a magnet.

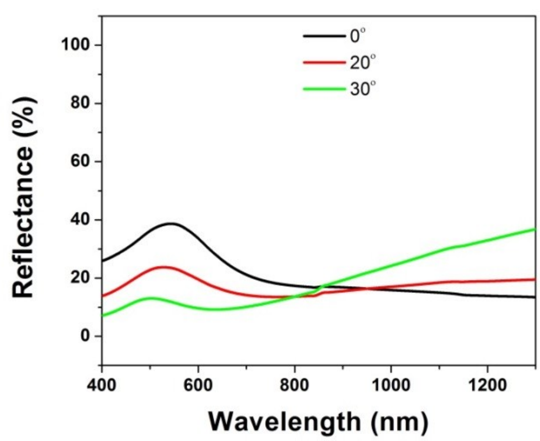


Fig. S6 Measured transmission spectra of γ-Fe_2O_3@SiO_2@Au ellipsoids in a magnetic field with different angles along their longitudinal direction.