Supporting Information

Synthesis of Nonspherical Mesoporous Silica Ellipsoids with Tunable Aspect Ratios for Magnetic Assisted Assembly and Gene Delivery

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Movie-S1 A movie showing the TEM tilt series ranging from -60° to +60° at an interval of 1°.

Movie-S2 Tomogram movie show the shape of ellipsoidal cross-section changes from near round at a tip position to regular hexagon in the middle, and then back to near round shape at another tip position, confirming a unique non-perfect ellipsoidal shape.

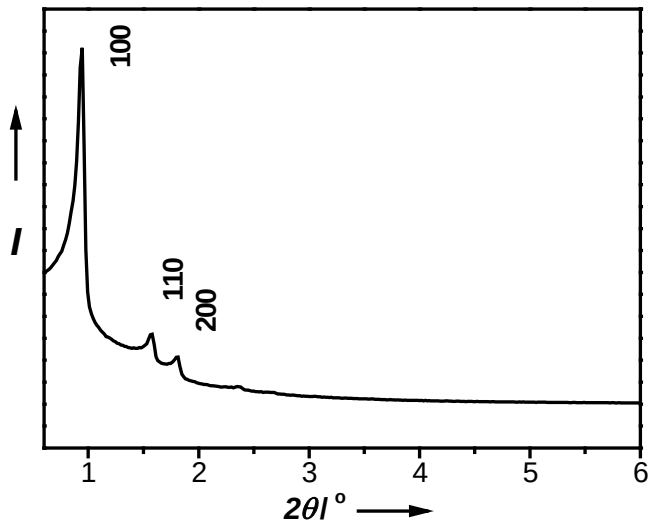

Figure S1, XRD pattern of typical calcined mesoporous silica ellipsoids (aspect ratio of 2.26).

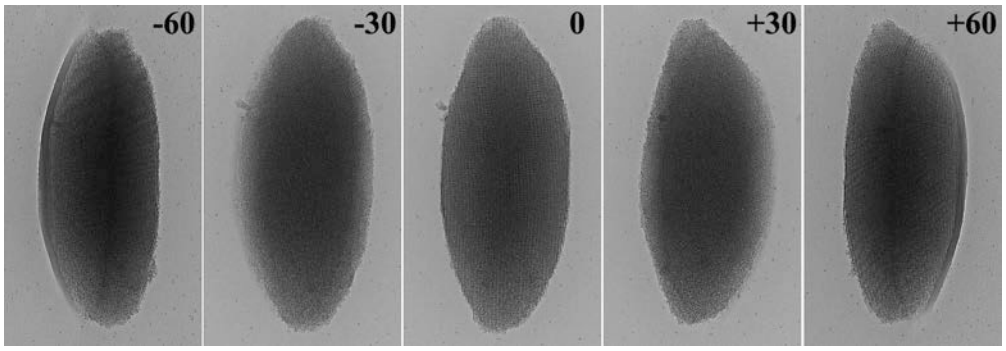

Figure S2, Five typical TEM images at the tilt angles of 0, ±30 and ±60°, respectively.

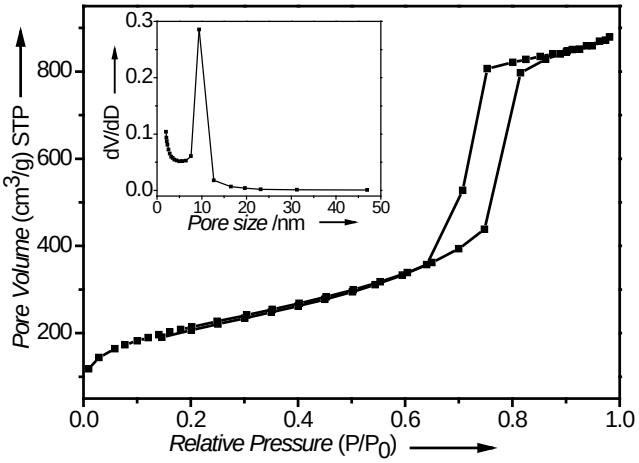

Figure S3, N_2 adsorption-desorption isotherm of typical mesoporous silica ellipsoids with an aspect ratio of 2.26 and the pore size distribution curve (inset).

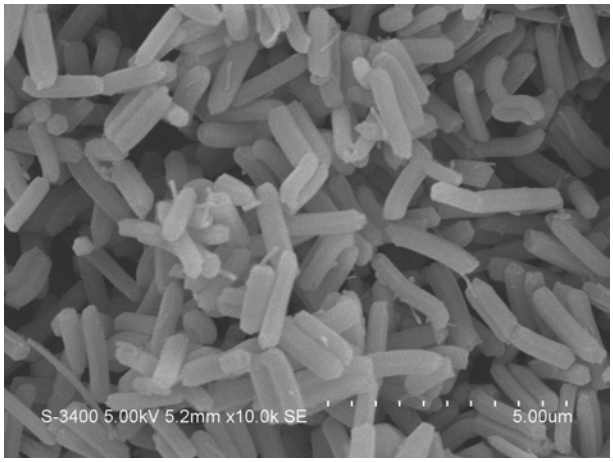

Figure S4, SEM image of calcined mesoporous silica rod prepared with the amount of ethanol of 0.5 g.

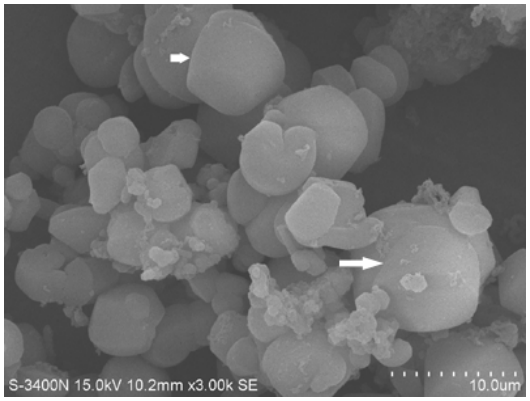

Figure S5, SEM image of calcined mesoporous silica with curled pseudo-spherical shape (marked arrow) prepared with the amount of ethanol of 5.0 g.

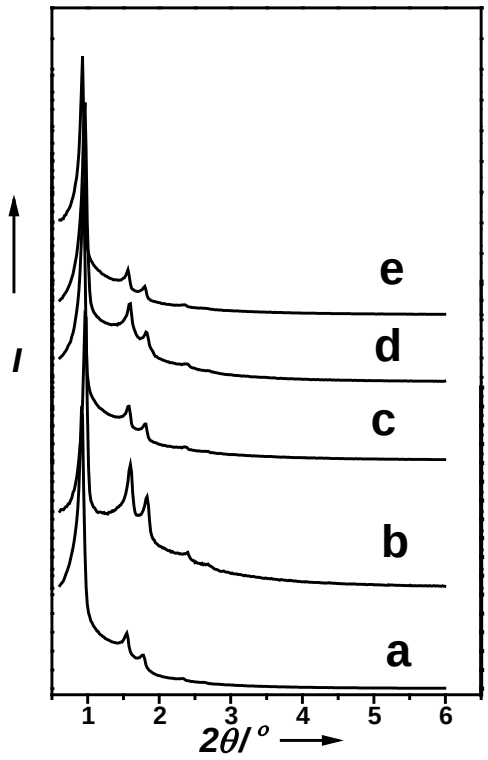

Figure S6, XRD patterns (a-e) of calcined mesoporous silica ellipsoids prepared with the amount of ethanol at (a~e) 1.4, 1.6, 1.8, 2.0 and 2.2 g, respectively.

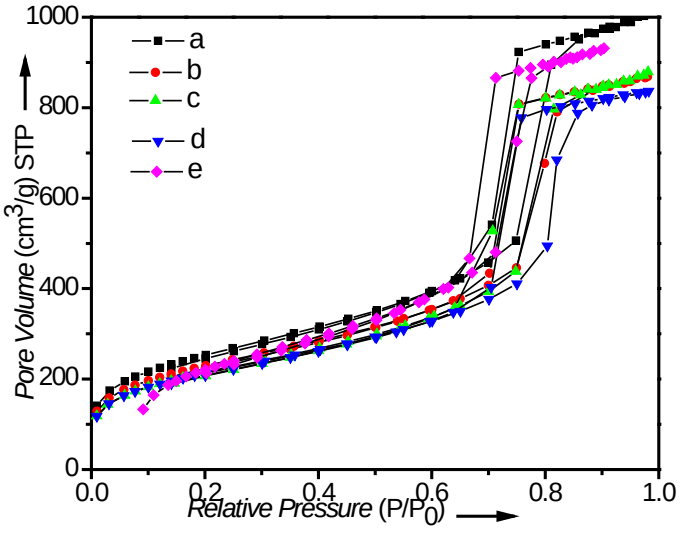

Figure S7, N_2 adsorption-desorption isotherms of calcined mesoporous silica ellipsoids prepared with the amount of ethanol at (a~e) 1.4, 1.6, 1.8, 2.0 and 2.2 g, respectively.

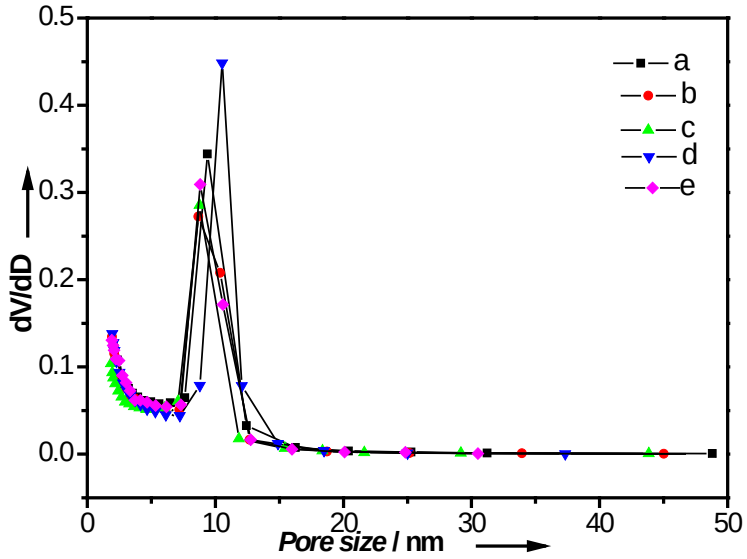

Figure S8, Pore size distribution of calcined mesoporous silica ellipsoids prepared with the amount of ethanol at (a~e)1.4, 1.6, 1.8, 2.0 and 2.2 g, respectively.

Table S1, The textural parameters of calcined mesoporous silica ellipsoids prepared the amount of ethanol at (a~e) 1.4, 1.6, 1.8, 2.0 and 2.2 g, respectively.

Sample No.	aspect ratio	$d_{(100)}$(nm)[a]	*a*(nm)[b]	S_{BET}(m^2/g)[c]	V (cm^3/g)[d]	w(nm)[e]
a	2.94	9.7	11.2	911	1.6	9.4
b	2.46	9.2	10.6	825	1.38	9.3
c	2.26	9.4	10.8	773	1.38	9.4
d	2.06	9.2	10.6	768	1.33	11.3
e	1.91	9.5	10.9	865	1.48	9.4

a: (100) interplanar distance. b: cell parameter. c: BET (Brunauer, Emmet, and Teller) specific surface area. d: Total pore volume calculated as the amount of nitrogen adsorbed at the relative pressure of ca.0.99. e: Pore diameter.

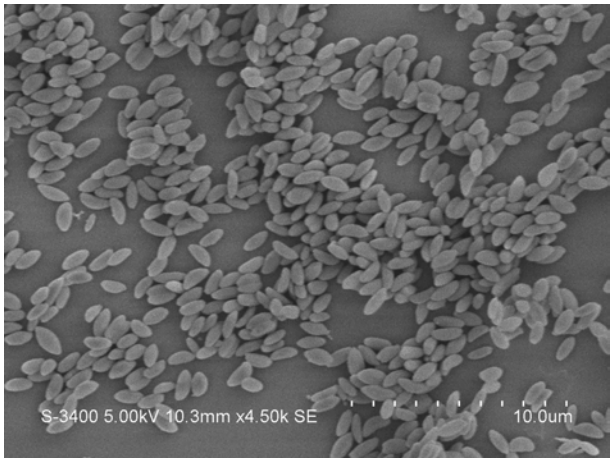

Figure S9, SEM image of Fe_3O_4/silica composite ellipsoids with an aspect ratio of 2.26.

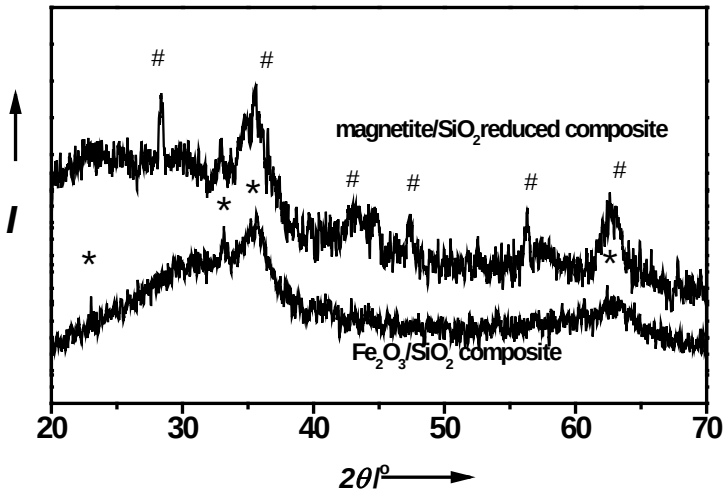

Figure S10, XRD patterns of the Fe_2O_3/SiO_2 composite and reduced ellipsoidal composite with an aspect ratio of 2.26. The XRD pattern of Fe_2O_3/SiO_2 composite matches the standard Fe_2O_3 data from JCPDS data No.33-0664 (*)well, while that of the reduced magnetite ellipsoidal composite matches the standard Fe_3O_4 data from JCPDS data No. 06-0629 (#) well.

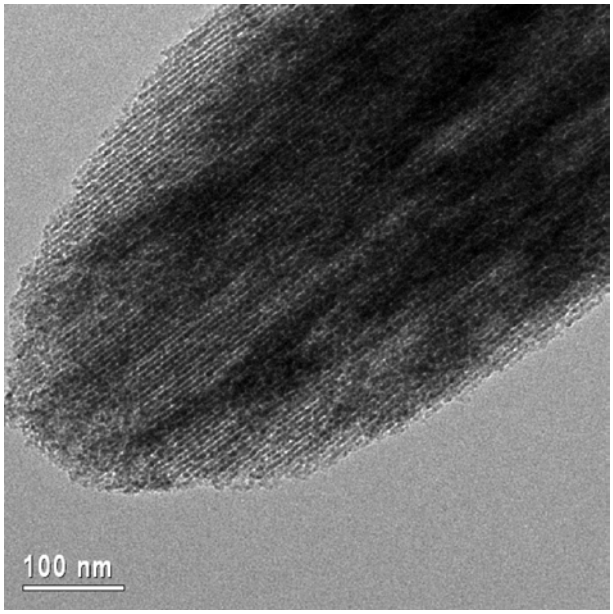

Figure S11, TEM image of Fe_3O_4/silica composite ellipsoids.

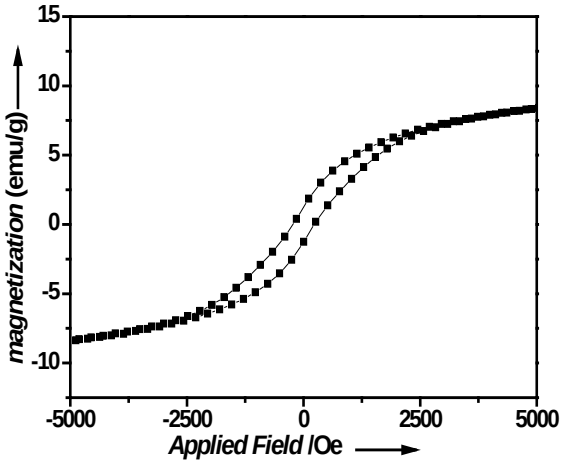

Figure S12, Vibrating sample magnetometer (VSM) measurement of the mesoporous ellipsoidal magnetite/silica sample with an aspect ratio of 2.26 at room temperature. The hysteresis loop of the curve indicates a ferromagnetic behavior with an Ms of 8.0 emu/g and a coercivity (Hc) of 225 Oe.