Supporting Information

Restructure of Co$_3$O$_4$ particles from polycrystalline microspheres to single-crystalline polyhedra under the assistance of acetic acid

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Fig. S1. SEM images of samples obtained at different concentration of H$_2$SO$_4$ aqueous solution: (a) 1%, (b) 5%, (c) 10% and (d) 20%.
Fig. S2. SEM images of samples obtained at different concentration of citric acid aqueous solution:

(a) 1%, (b) 5%, (c) 10% and (d) 20%.
Fig. S3. SEM images of samples obtained at different treating temperatures with 5% H$_2$SO$_4$ aqueous solution: (a) 10 °C, (b) 30 °C, (c) 60 °C and (d) 90 °C.
Fig. S4. SEM images of samples obtained at different treating temperatures with 5% citric acid aqueous solution: (a) 10 °C, (b) 30 °C, (c) 60 °C and (d) 90 °C.
Fig. S5. Crystal structures of (110), (211), (311) and (331) facets of Co$_3$O$_4$. (a), (b), (e) and (f) are side view images; (c), (d), (g) and (h) are top view images of (110), (211), (311) and (331) facets, respectively. The red, blue and cyan balls represent O, Co$^{3+}$, and Co$^{2+}$, respectively. The X, Y, and Z directions show scheme of the crystal structure, and the white point in (g) represent that the X direction perpendicular to the paper.