

Supporting Information

Self-assembly of Magnetite Mesocrystal Microdisks with Hierarchical Architectures

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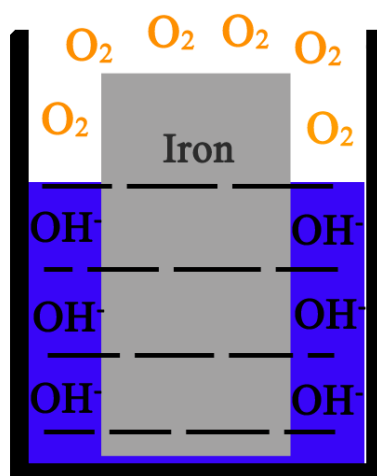


Fig.S1 Diagram of the preparation. One piece of iron foil was put into a glass beaker. Concentrated NaOH aqueous solution was added. Part of the iron foil ~10mm was above on the solution. Oxygen in air could get in touch with the part of iron that above the solution. Herein, an oxygen-concentration cell was formed, where the part of iron above the solution with higher oxygen concentration acted as cathode, another part of iron immersed in the solution with lower oxygen concentration acted as anode. During the reaction, anode was corroded and black products showed up.

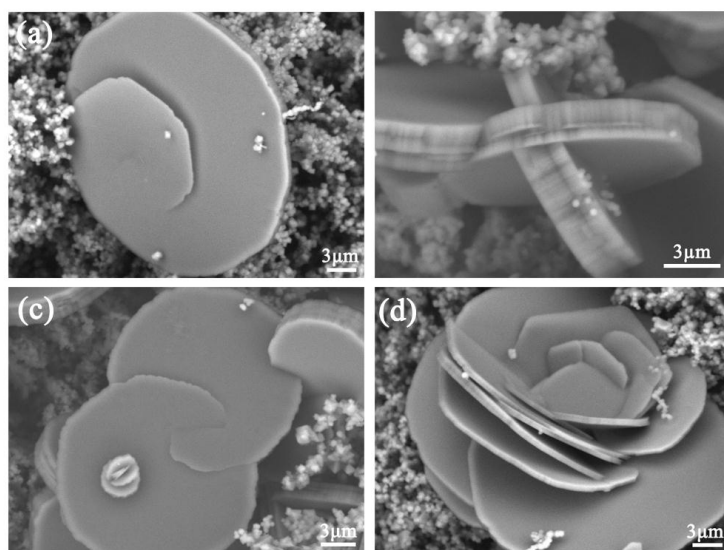


Fig.S2 SEM images of MMMs obtained after 130h with various morphologies. (a) spiral growth morphology, (b) and (c) interpenetrated morphologies, (d) flower morphology.

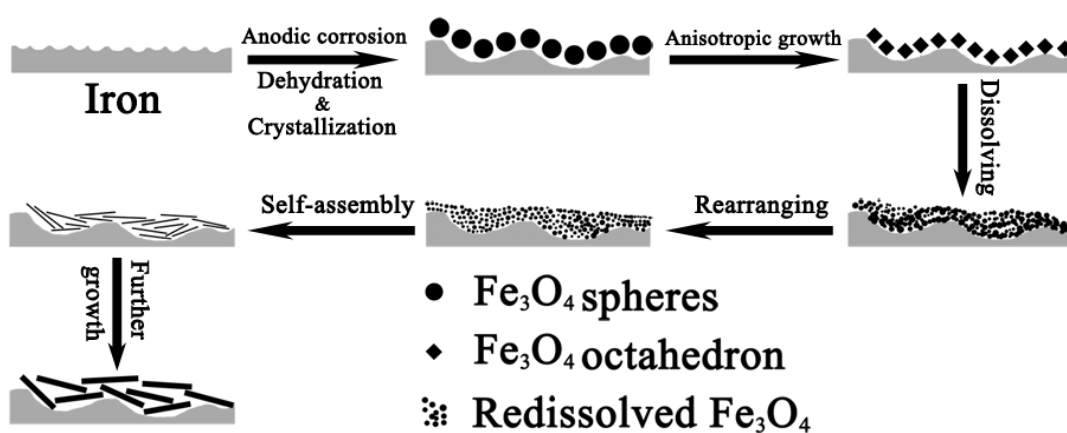


Fig. S3 Schematic diagram of the growth of MMMs.

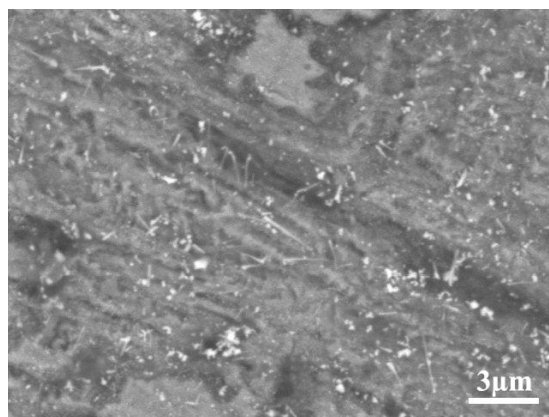


Fig.S4 SEM image of the iron foil surface after reaction for 25h in 6M NaOH aqueous solution. There was no obvious product compared to the result showed in Fig.4b. This indicates the dilute base solution is not suitable for the formation of magnetite.

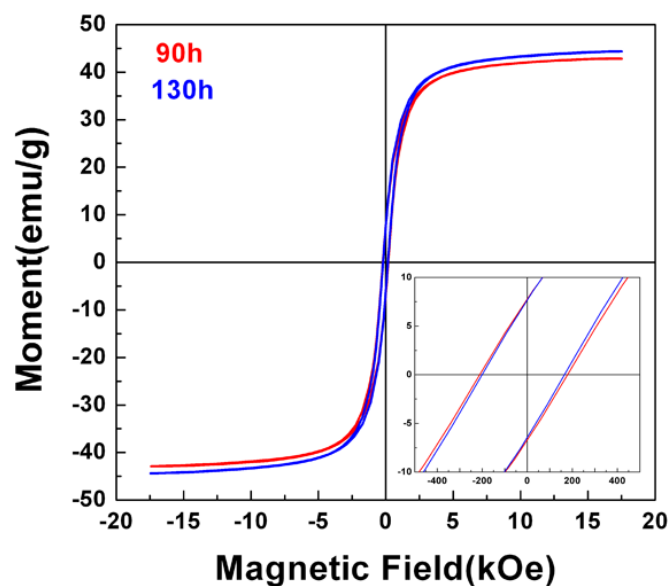


Fig. S5 Room temperature magnetic hysteresis loops of samples obtained after 90h and 130h. The saturated magnetization (M_s), remanent magnetization (M_r) and coercivity (H_{ci}) values of 90h sample are 42.92 emu/g, 7.24 emu/g and 198.1 Oe, respectively.

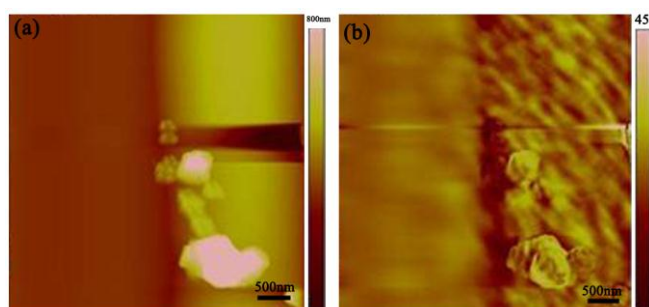


Fig. S6 (a) AFM image and (b) MFM image (zero field) of one single magnetite mesocrystal microdisk obtained after 130h reaction. The left side in each image is the substrate of Si coated with Pt, the right side is the sample.