

Supporting Information

Electric Field-Induced Synthesis of Dendritic Nanostructure α -Fe for Electromagnetic Absorption Application

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Figure of contents

Fig. S1	2
Fig. S2	3
Fig. S3	4
Fig. S4	5
Fig. S5	6
Fig. S6	7
Fig. S7	8

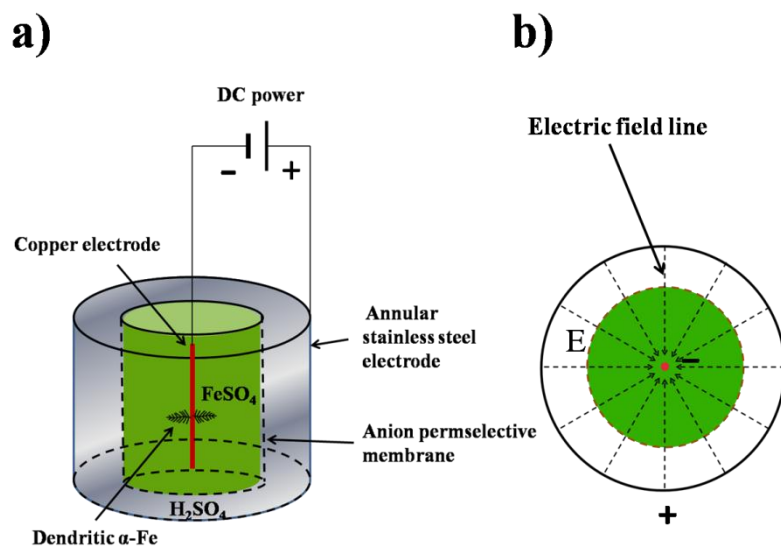


Fig. S1. a) Schematic diagram of the annular electrolyser with a symmetrical electric field; b)

Vertical views of annular electrolyser, which shows the symmetrical electric field lines.

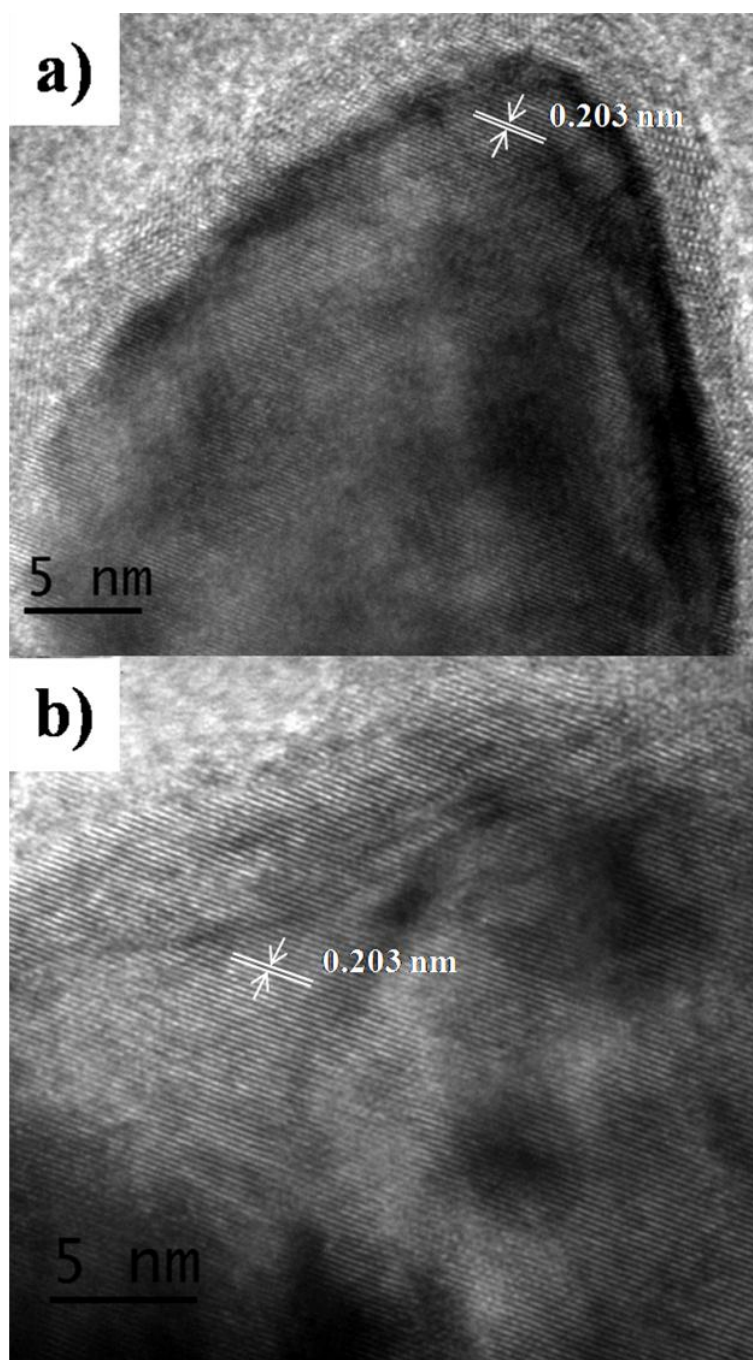


Fig. S2. The HRTEM images of obtained dendritic α -Fe under the current density of $30 \text{ A}\cdot\text{cm}^{-2}$ for 30 seconds: a) the tip on the trunk; b) the branch near the trunk.

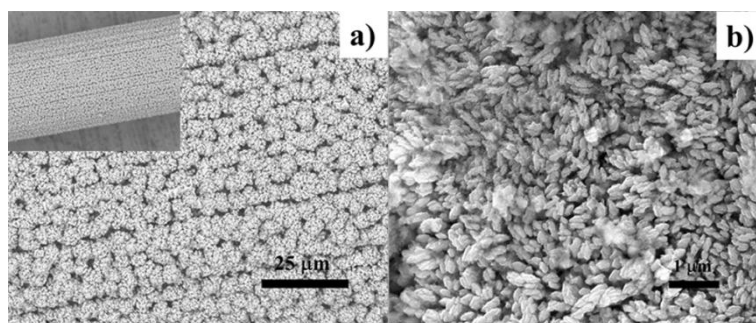


Fig. S3. a) Low-magnification and b) high-magnification SEM images of obtained α -Fe under the current density of $0.2 \text{ A} \cdot \text{cm}^{-2}$ for 60 seconds. The inset of a) is the low-magnification SEM image of Cu wire electrode with obtained α -Fe.

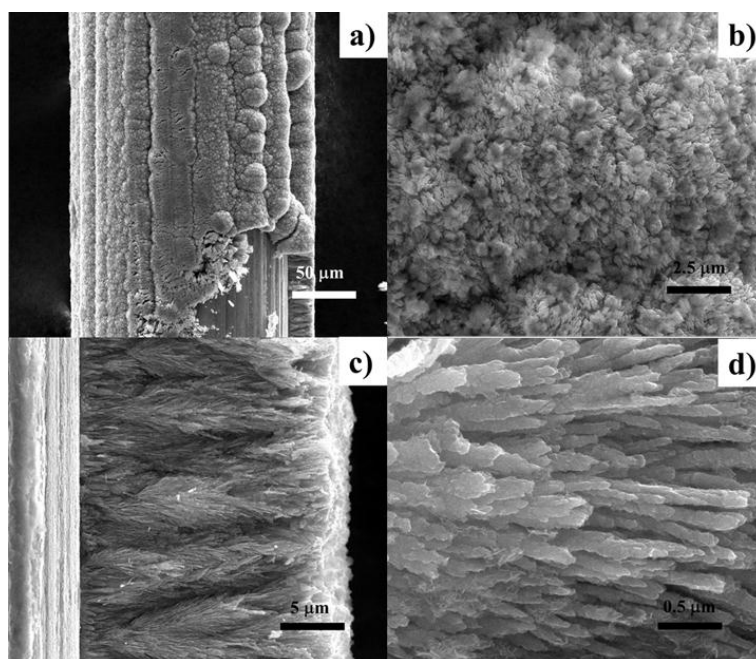


Fig. S4. The SEM images of obtained α -Fe under the current density of $0.4 \text{ A} \cdot \text{cm}^{-2}$ for 60 seconds:

a) low-magnification SEM image of Cu wire electrode with obtained α -Fe; b) the high-magnification surface SEM image of obtained α -Fe; c) the section SEM image of obtained α -Fe and d) the high-magnification section SEM image of obtained α -Fe.

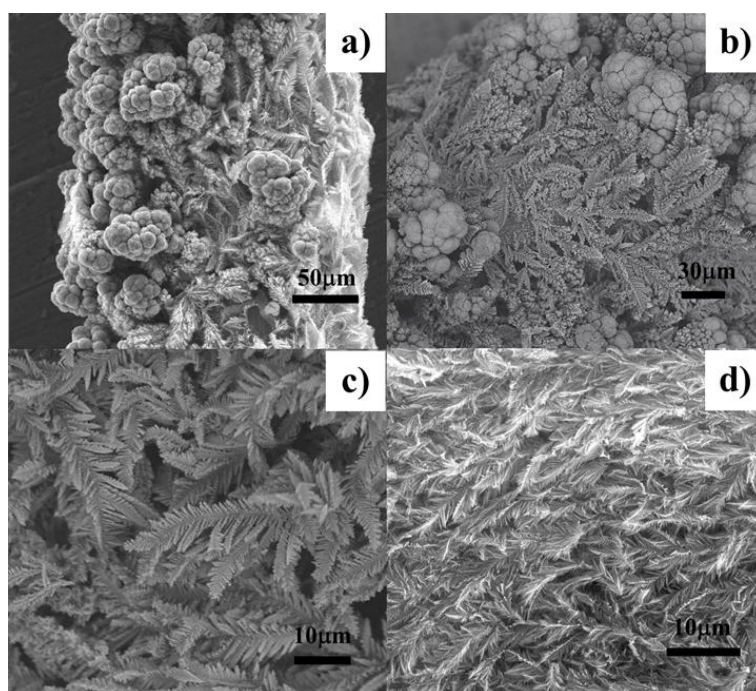


Fig. S5. The SEM images of obtained α -Fe under the current density of a) $1.0 \text{ A}\cdot\text{cm}^{-2}$ for 60 seconds; b) $1.0 \text{ A}\cdot\text{cm}^{-2}$ for 150 seconds; c) $4.0 \text{ A}\cdot\text{cm}^{-2}$ for 30 seconds and d) $30.0 \text{ A}\cdot\text{cm}^{-2}$ for 15 seconds.

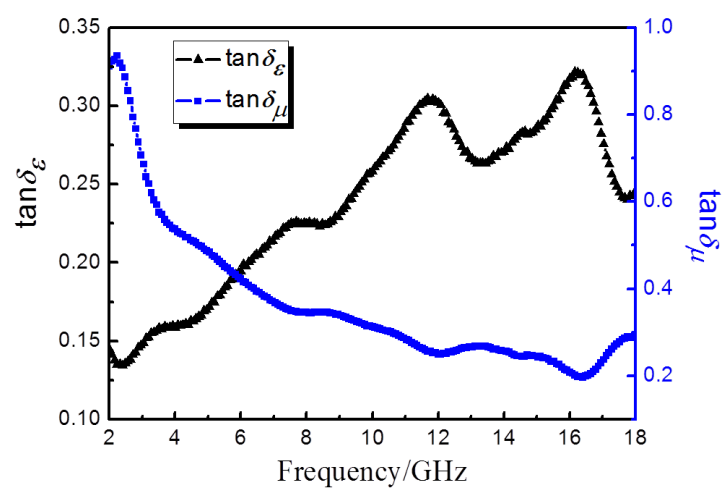


Fig. S6. The dielectric loss tangents ($\tan \delta_\epsilon = \epsilon''/\epsilon'$) and magnetic loss tangents ($\tan \delta_\mu = \mu''/\mu'$) of dendritic α -Fe under different frequency.

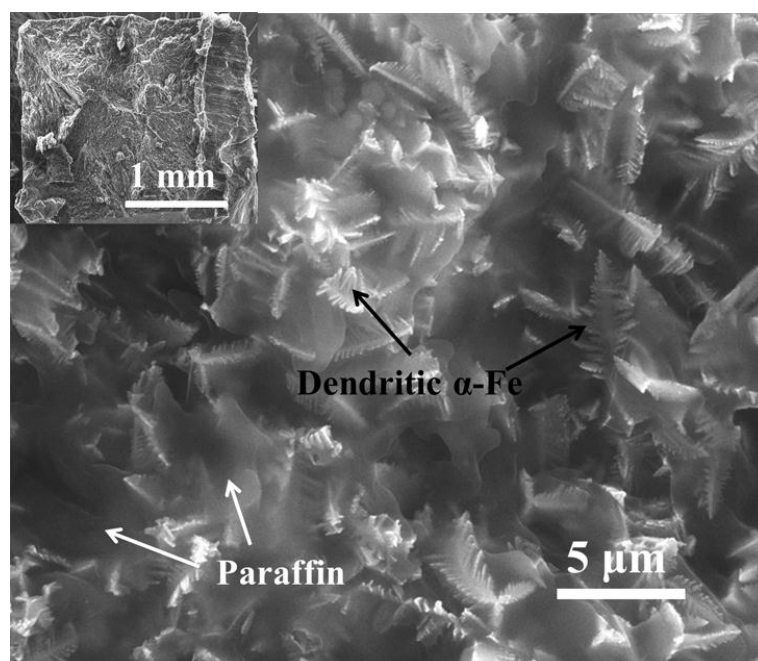


Fig. S7. The section SEM image of sample tested on a vector network analyzer. The insert panel is the low-magnification SEM image of the whole sample section.