

Electronic supporting information

Substrate-induced Hydrothermal Synthesis of Hematite

Superstructure and Their Fischer-Tropsch synthesis Performance

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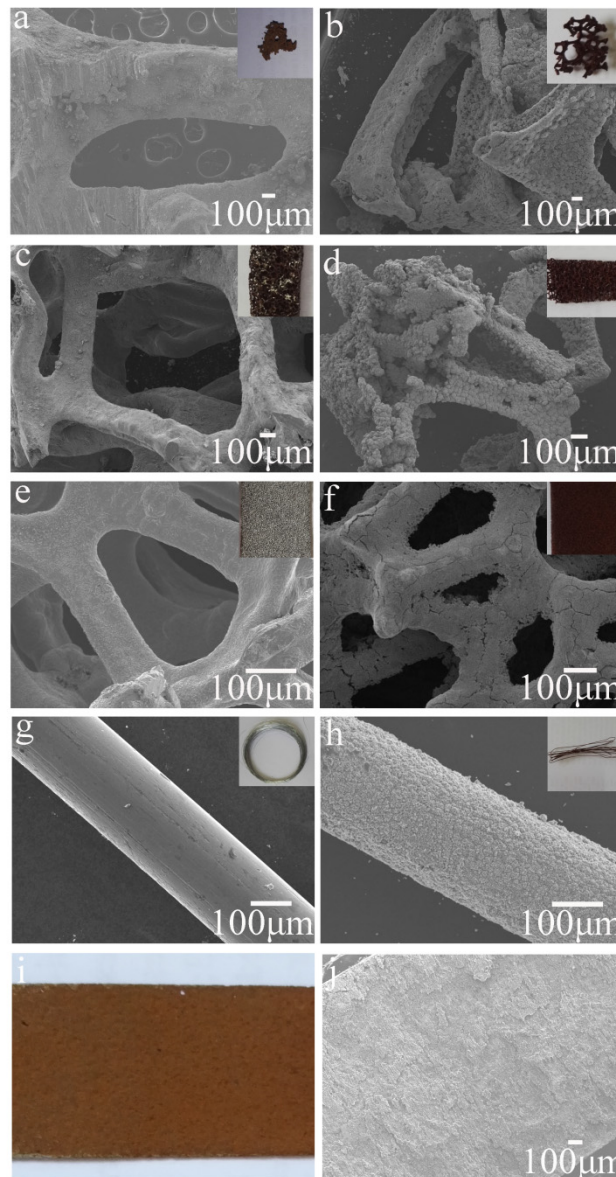


Fig. S1 FESEM images of (a) the original 5ppi Fe foam substrate (b) the corresponding uniform growth layer of α -Fe₂O₃, (c) the original 20ppi Fe foam substrate (d) the corresponding uniform growth layer of α -Fe₂O₃, (e) the original 100ppi Fe foam substrate (f) the corresponding uniform growth layer of α -Fe₂O₃, (g) the original iron wire with a diameter of 200 μ m (h) the corresponding uniform growth layer of α -Fe₂O₃. The inserted represent the optical images of various substrates. (i) the optical image of growth layer of α -Fe₂O₃ (j) FESEM image of growth layer of α -Fe₂O₃.

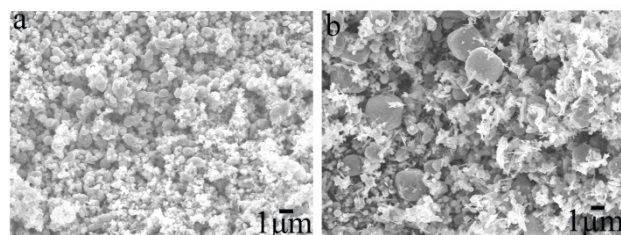


Fig. S2 The powder in the autoclave which did not grow on the 100ppi Fe foam substrate: (a) 100ppi-Fe²⁺, (b) 100ppi-Fe³⁺.

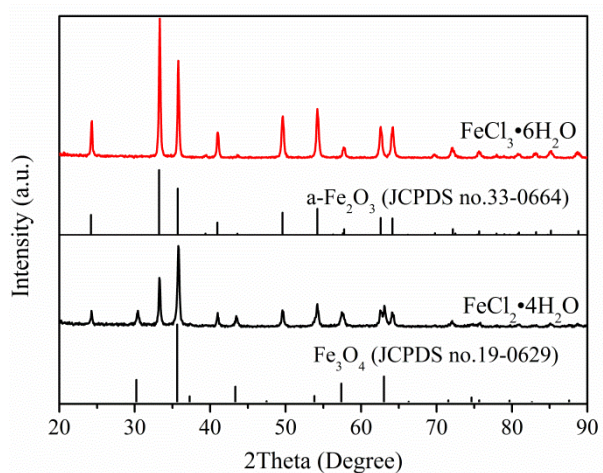


Fig. S3 XRD patterns of the powder catalysts prepared by $\text{FeCl}_2 \cdot 4\text{H}_2\text{O}$ and $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ in the absence of Fe foam substrate.

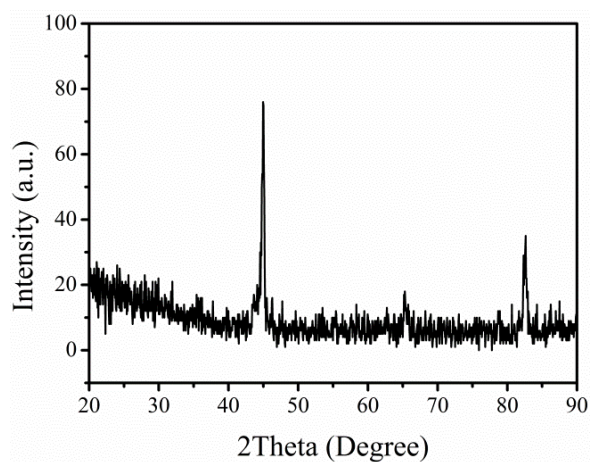


Fig. S4 XRD pattern of 100ppi- Fe^{2+} catalyst after reaction of 12 h.

Table S1 The Fe^{2+} content determined by ORT method.

| Sample | 5ppi- Fe^{2+} | 5ppi- Fe^{3+} | 20ppi- Fe^{2+} | 20ppi- Fe^{3+} | 100ppi- Fe^{2+} | 100ppi- Fe^{3+} |
|------------------------|------------------------|------------------------|-------------------------|-------------------------|--------------------------|--------------------------|
| Fe^{2+} (ORT) | 21.2 | 6.3 | 20.7 | 6.8 | 21.3 | 7.3 |