

Supporting Information

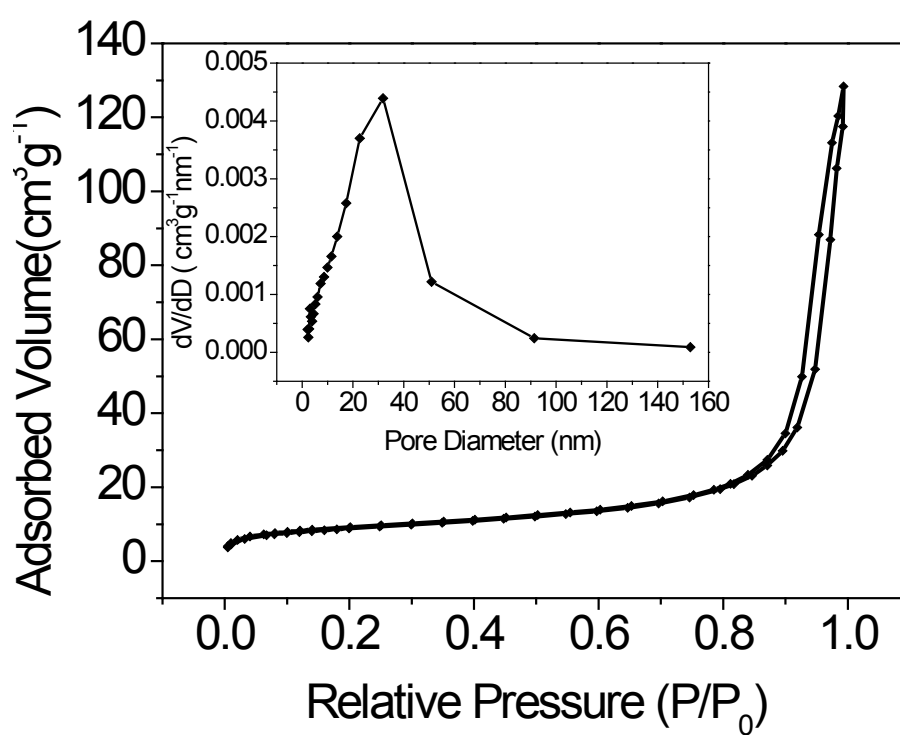


Fig. S1 Nitrogen adsorption-desorption isotherm and the pore size distribution curve (inset) of the α -Fe₂O₃ assembled micro-plates.

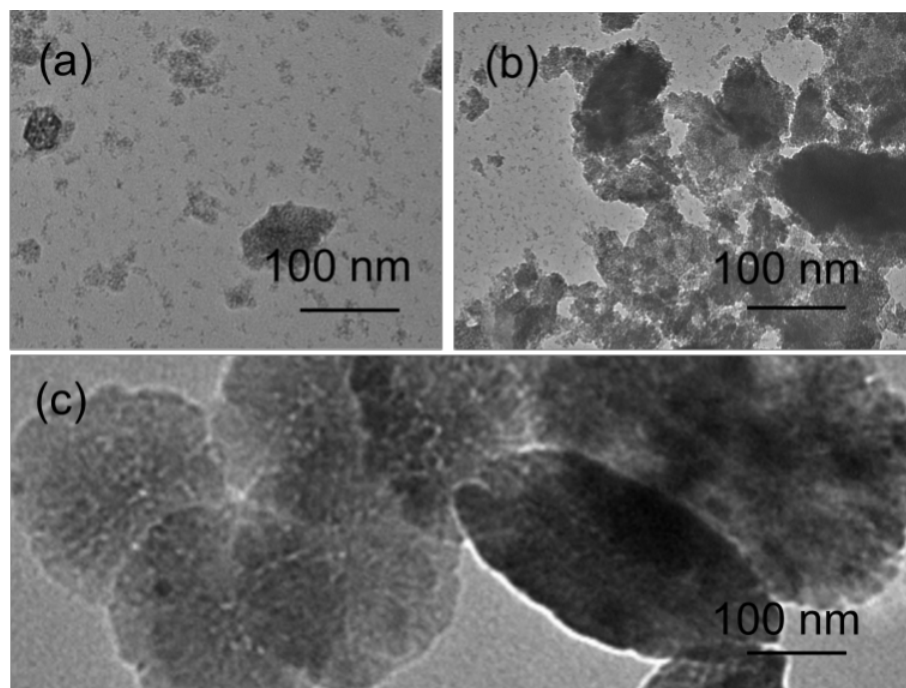


Fig. S2 Evolution process of the porous single-crystalline α -Fe₂O₃ micro-plates at different times: (a) 4h, (b) 8h and (c) 48 h.

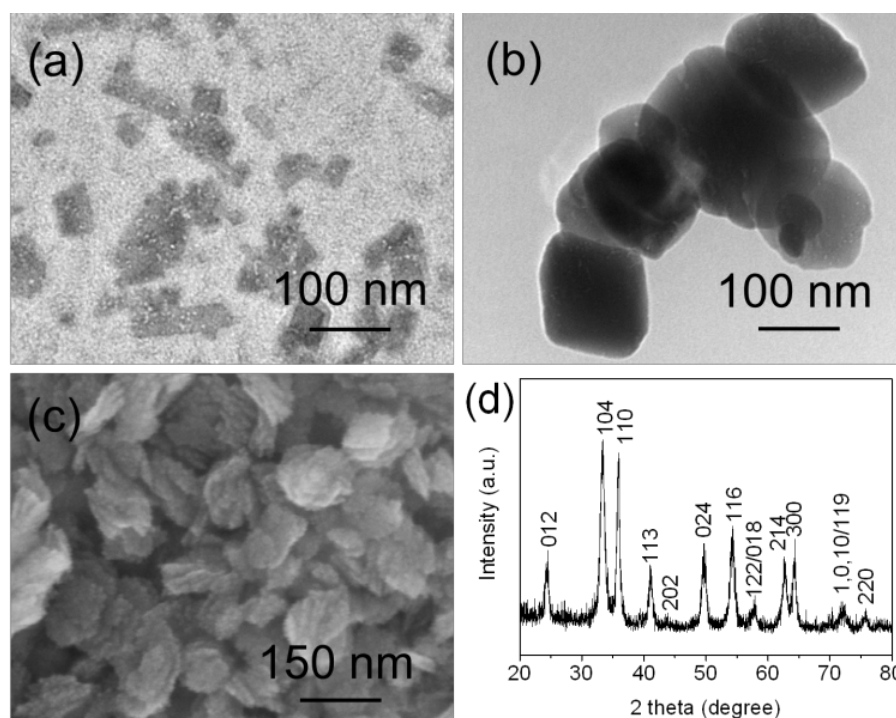


Fig. S3 (a and b) TEM images of the samples synthesized without being heated while other condition kept constant, and in the sealed autoclave at 120 °C while other condition kept constant, respectively. (c and d) SEM image and XRD pattern of the sample synthesized without using ionic liquid while other condition kept constant.

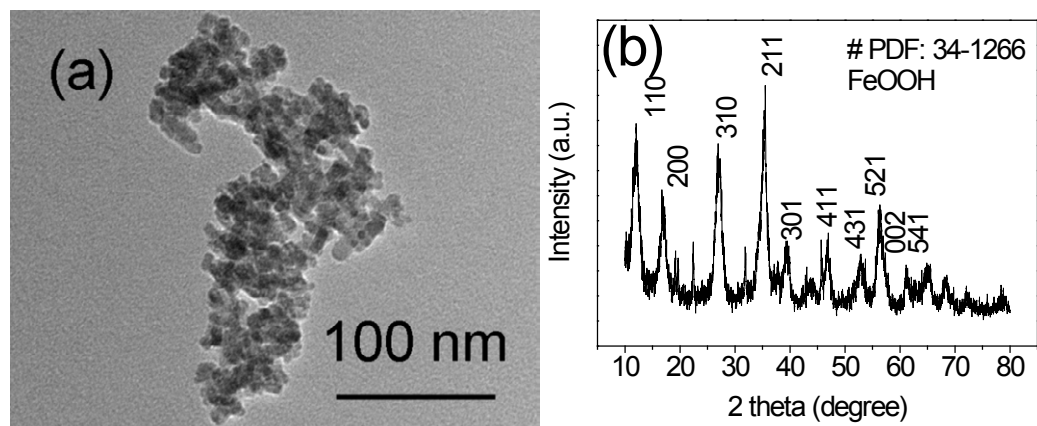


Fig. S4 (a) SEM image and (b) XRD pattern of the sample obtained when [Bmim]BF₄ replacing [Bmim]Cl while other conditions kept constant.

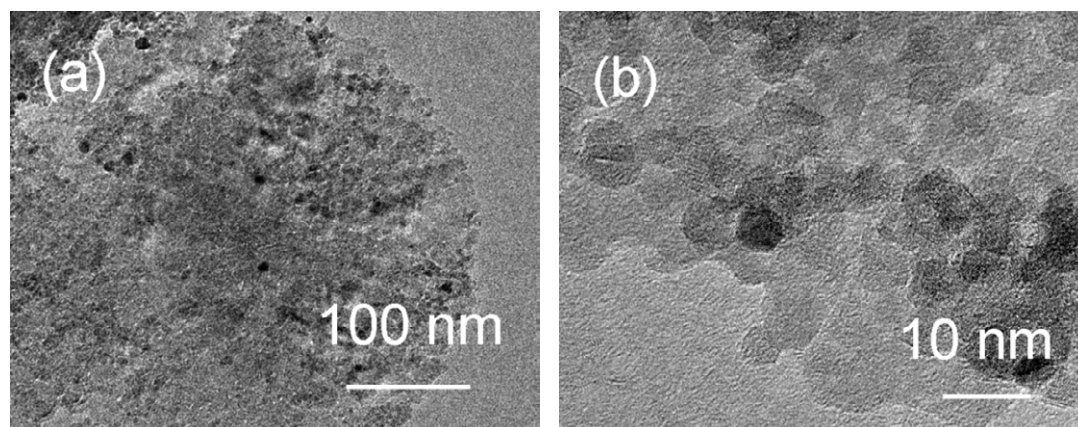


Fig. S5 (a and b) TEM images for the typical Cat1.

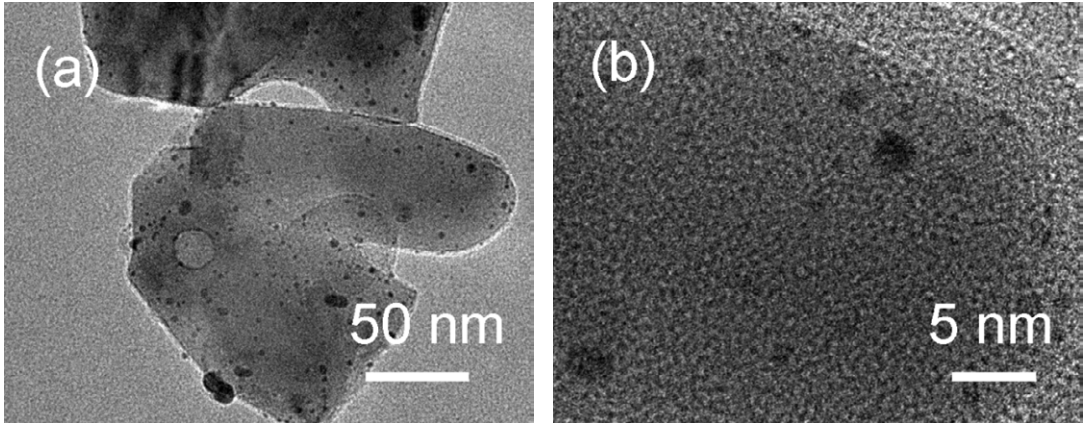


Fig. S6 (a and b) TEM images for the typical Cat3.

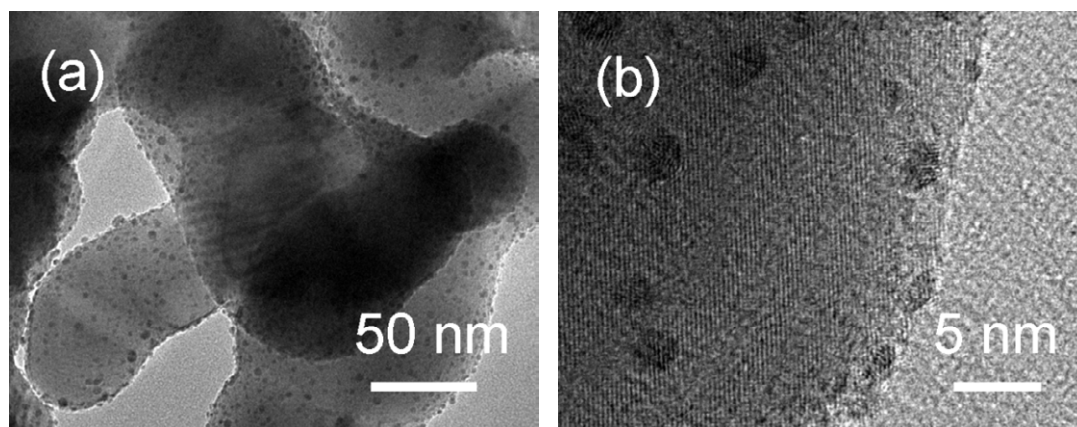


Fig. S7 (a and b)TEM images for the typical Cat4.

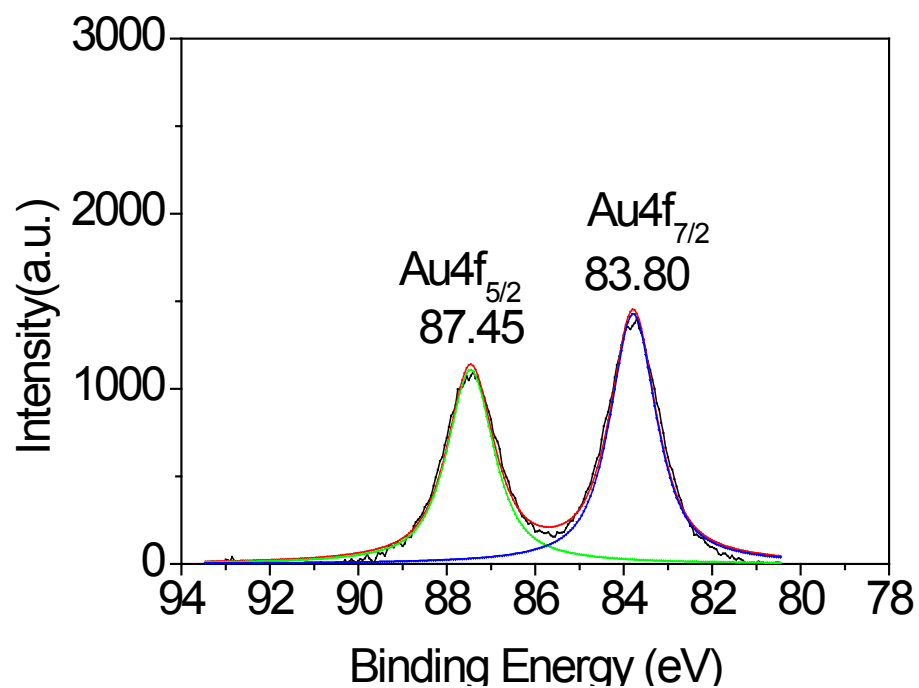


Fig. S8 XPS spectrum of Au4f of Cat2.

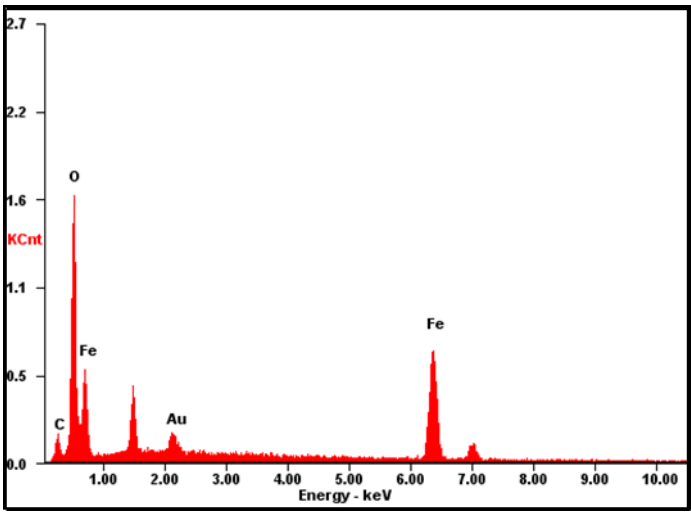


Fig. S9 EDX spectrum of the typical Cat2.

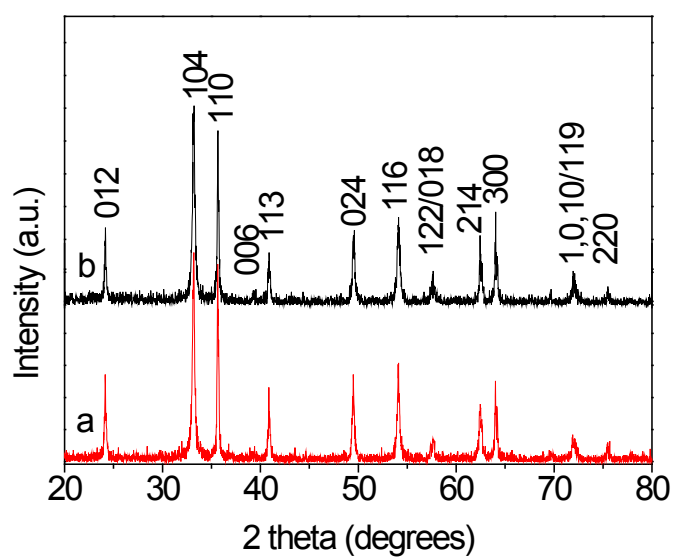


Fig. S10 XRD patterns of the porous α -Fe₂O₃ samples annealed at different temperatures: (a) 250 °C and (b) 400 °C.