Supporting Information

Hierarchical $FeWO_4$ Microcrystals: Solvothermal Synthesis, and Their Photocatalytic and Magnetic Properties

*Yu-Xue Zhou, Hong-Bin Yao, Qiao Zhang, Jun-Yan Gong, Shu-Juan Liu, Shu-Hong Yu**

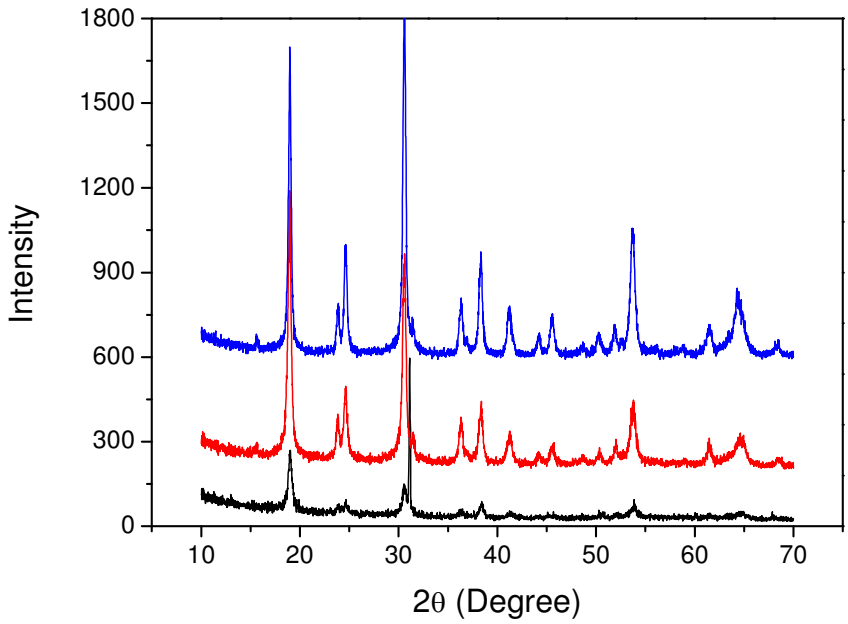

Figure S1. XRD patterns of $FeWO_4$ obtained at 200°C for different reaction time, $[FeCl_3] = [Na_2WO_4] = 0.02$ mol L^{-1}, [NaAc] = 0.2 mol L^{-1}, V_{H2O}: V_{EG} = 1:9. (a) 4 h, (b) 5 h, (c) 12 h.

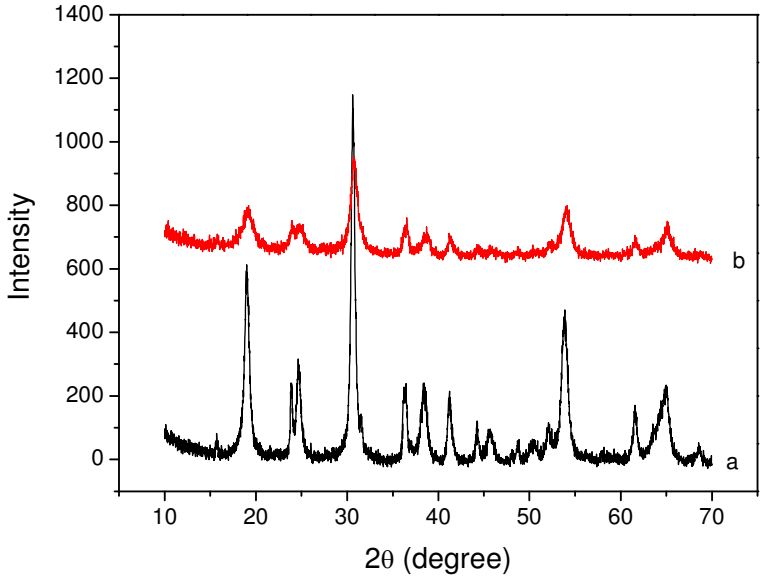

Figure S2. XRD patterns of $FeWO_4$ microcrystals obtained at 200 °C for 12 h in media with different volume ratio of H_2O and EG (V_{H2O}: V_{EG}) (a) 2:8 , (b) 3:7 . [$FeCl_3$] = [Na_2WO_4] = 0.02 mol L^{-1}, [NaAc] = 0.2 mol L^{-1}.

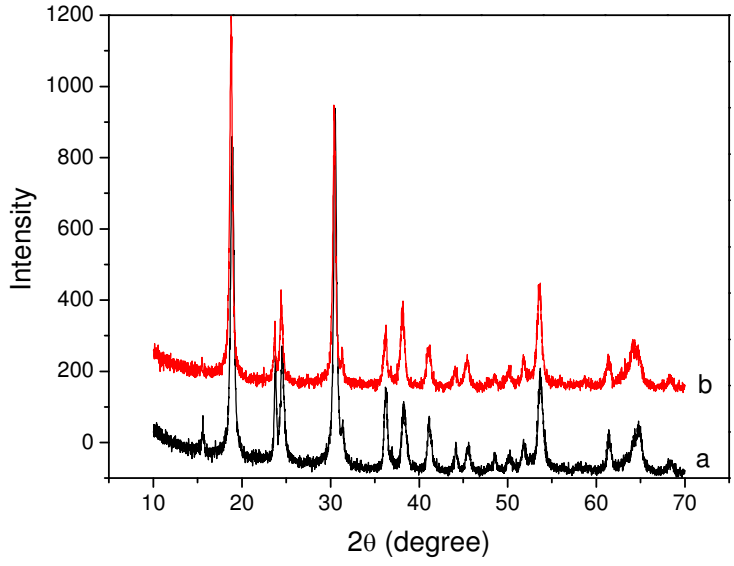

Figure S3. XRD patterns of $FeWO_4$ microcrystals prepared at 200 °C for 12 h, [$FeCl_3$] = [Na_2WO_4] = 0.02 mol L^{-1}. (a) [NaAc]= 0.04 mol·L^{-1}, (b) [NaAc] = 0.4 mol·L^{-1}.

Table S1. Products obtained by using different alkaline source in reaction solution.

Dosage of alkaline source (10 mmol)	Composition of the products
HCOONa (a)	disk-like $FeWO_4$ microcrystals
$Na_2C_2O_4$ (b)	irregular $FeWO_4$ disk-like $FeWO_4$ microcrystals
CH_3CH_2COONa (c)	non-uniform hexangular $FeWO_4$ microcrystals
$NH_3.H_2O$ (d)	disk-like $FeWO_4$ microcrystals
NaOH (e)	maghemite
Na_2CO_3 (f)	maghemite

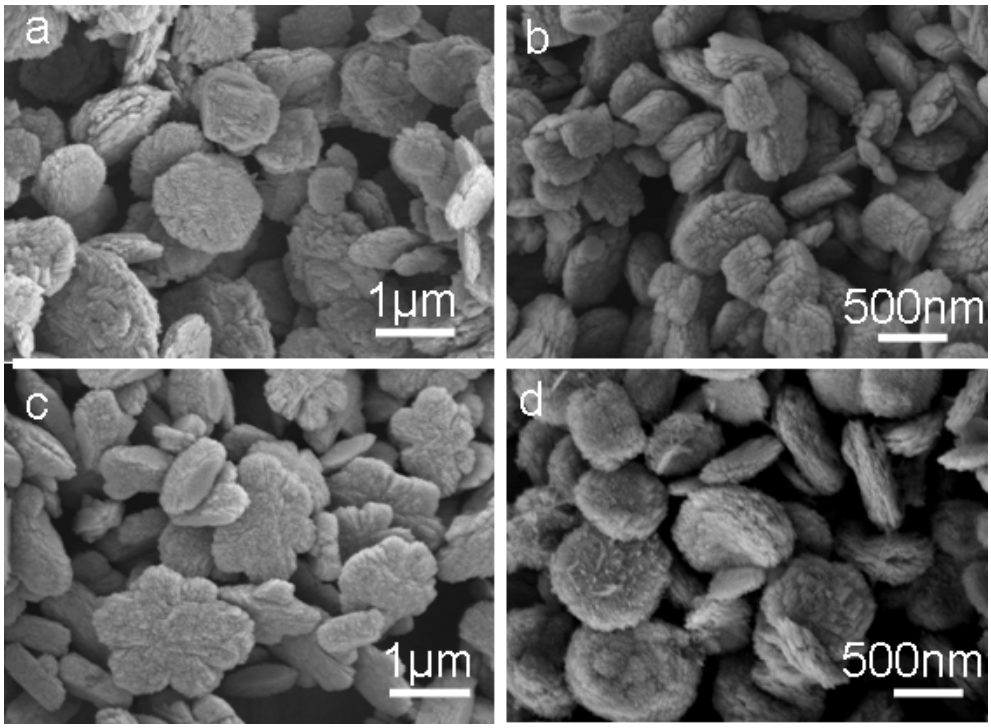

Figure S4. SEM images of $FeWO_4$ microcrystals prepared at 200 ^oC for 12 h by adding 10 mmol different alkaline source into reaction solution. (a) HCOONa, (b) $Na_2C_2O_4$, (c) CH_3CH_2COONa and (d) $NH_3.H_2O$ into reaction solution as alkaline source, $[FeCl_3] = [Na_2WO_4] = 0.02$ mol L^{-1}.

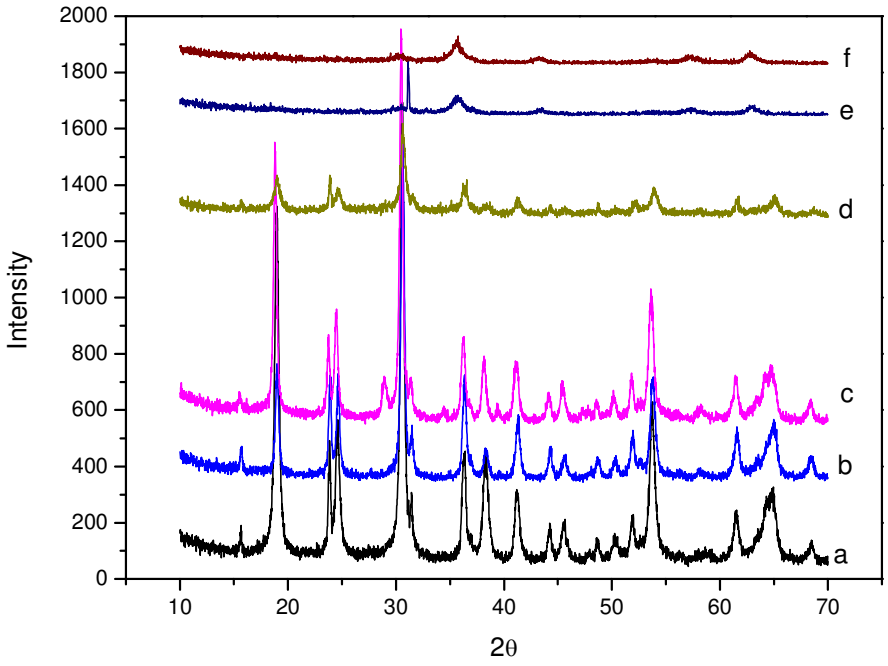

Figure S5. XRD patterns of the samples prepared at 200°C for 12 h by adding 10 mmol different alkaline source into reaction solution. (a) HCOONa, (b) $Na_2C_2O_4$, (c) CH_3CH_2COONa, (d) $NH_3.H_2O$, (e) NaOH and (f) Na_2CO_3. $[FeCl_3] = [Na_2WO_4] = 0.02$ mol L^{-1}.

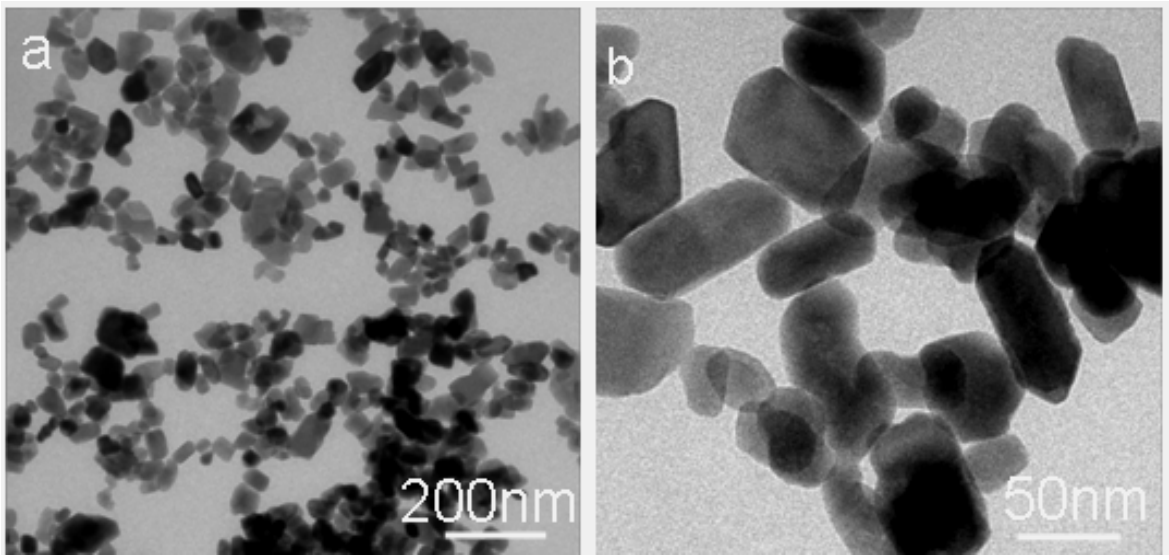

Figure S6. TEM images of the $FeWO_4$ nanocrystals prepared at 200 °C for 12 h without using EG. $[FeCl_2] = [Na_2WO_4] = 0.02\ mol \cdot L^{-1}$, $[NaAc] = 0.2\ mol \cdot L^{-1}$, $V_{H2O} = 50$ ml.

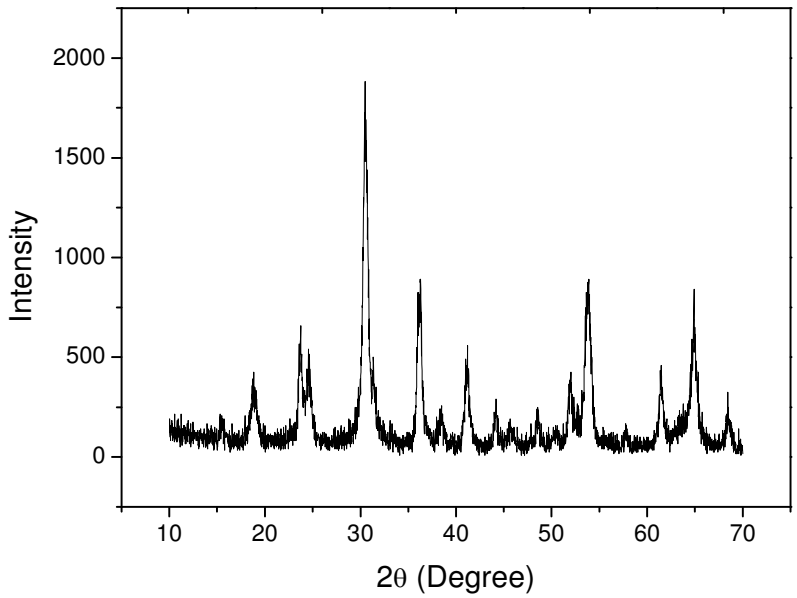

Figure S7. XRD pattern of the $FeWO_4$ nanocrystals prepared at 200 °C for 12 h without using EG. $[FeCl_2] = [Na_2WO_4] = 0.02\ mol \cdot L^{-1}$, $[NaAc] = 0.2\ mol \cdot L^{-1}$, $V_{H2O} = 50$ ml.

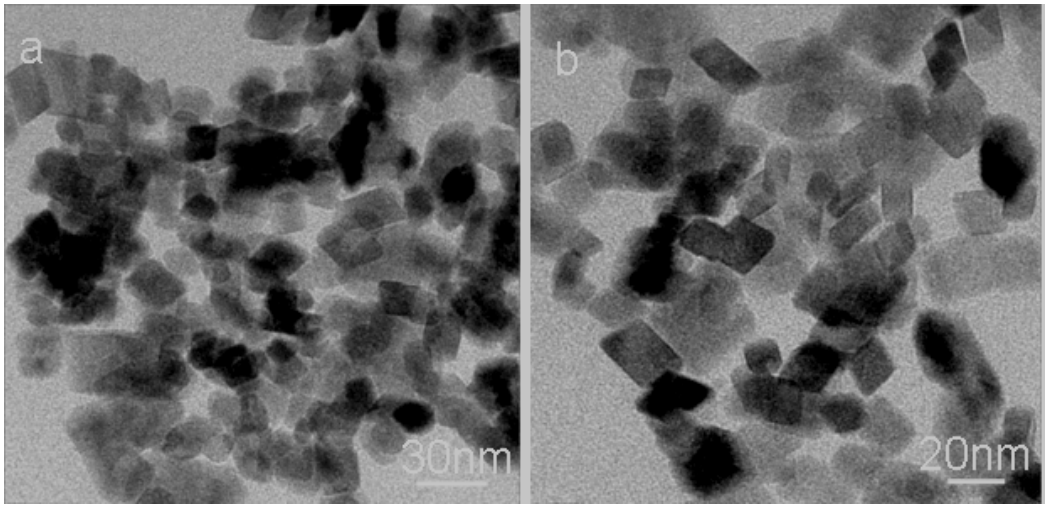

Figure S8. TEM images of $FeWO_4$ nanocrystals prepared at 200°C for 12 h, V_{H2O}: $V_{EG} = 1$: 9, $[FeCl_2] = [Na_2WO_4] = 0.02\ mol \cdot L^{-1}$, $[NaAc] = 0.2\ mol \cdot L^{-1}$.

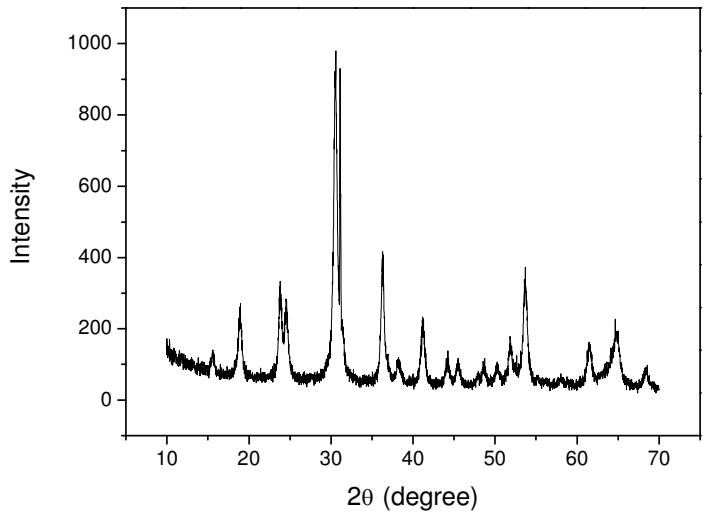

Figure S9. XRD pattern of the $FeWO_4$ nanocrystals prepared at 200 ^oC for 12 h in a mixed solvent. V_{H2O}: V_{EG} = 1: 9, [$FeCl_2$] = [Na_2WO_4] = 0.02 mol·L^{-1}, [NaAc] = 0.2 mol·L^{-1}.