Supporting information

Iron cations induced biphase symbiosis of h-WO_3/o-$WO_3 \cdot 0.33H_2O$ and their crystal phasetransition

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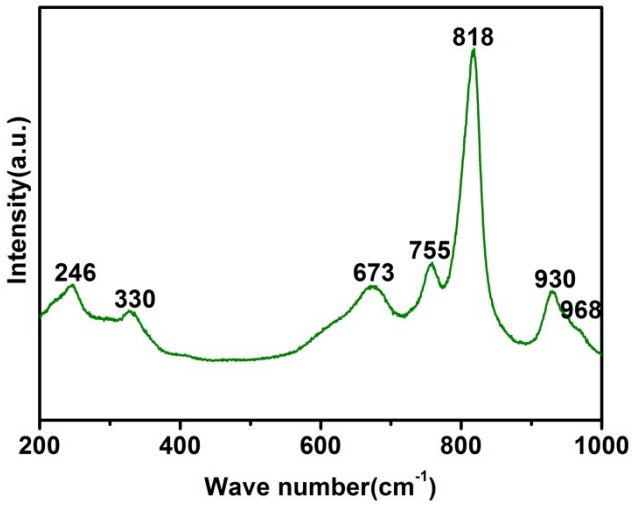

Fig. S1 The Raman spectrum of WFe0 (pure WO_3) sample.

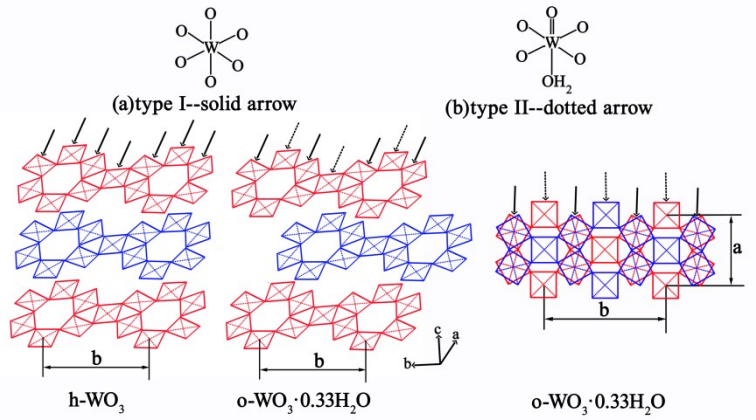

Fig. S2 Schematic illustration of h-WO_3 and o-$WO_3 \cdot 33H_2O$ structure (the second layer is shown with blue color).

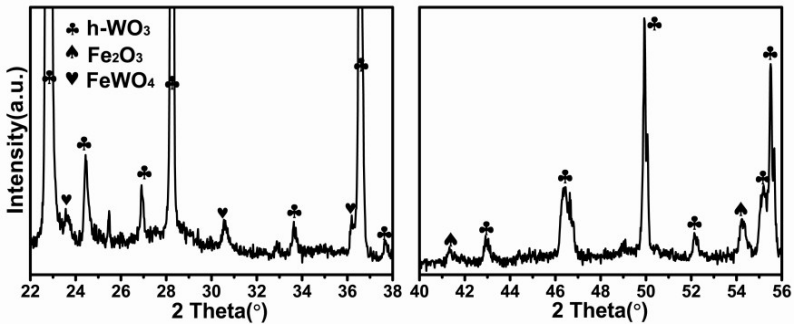

Fig. S3 The XRD patterns of enlarged areas for WFe0.20.

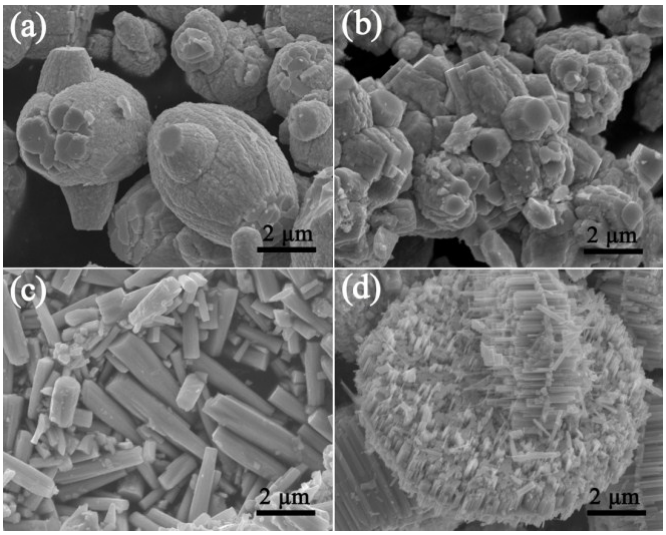

Fig. S4 The SEM images of samples with different nitrates: (a) $Ni(NO_3)_2 \cdot 6H_2O$; (b) $Co(NO_3)_2 \cdot 6H_2O$; (c) $Cd(NO_3)_2 \cdot 4H_2O$; (d) KNO_3

Samples with different morphologies were obtained by using different nitrates，revealing that it is the metal cations that can react with WO_3。

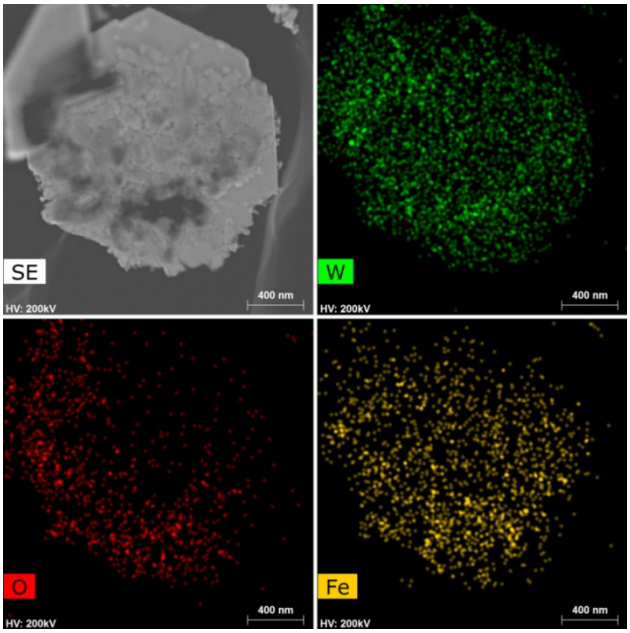

Fig. S5 The EDX elemental mapping images of WFe0.20.

A large number of Fe_2O_3 and $FeWO_4$ nanoparticles homogeneously disperse in agglomerated species while some their clusters still disperse on the surface of hexagonal prisms.

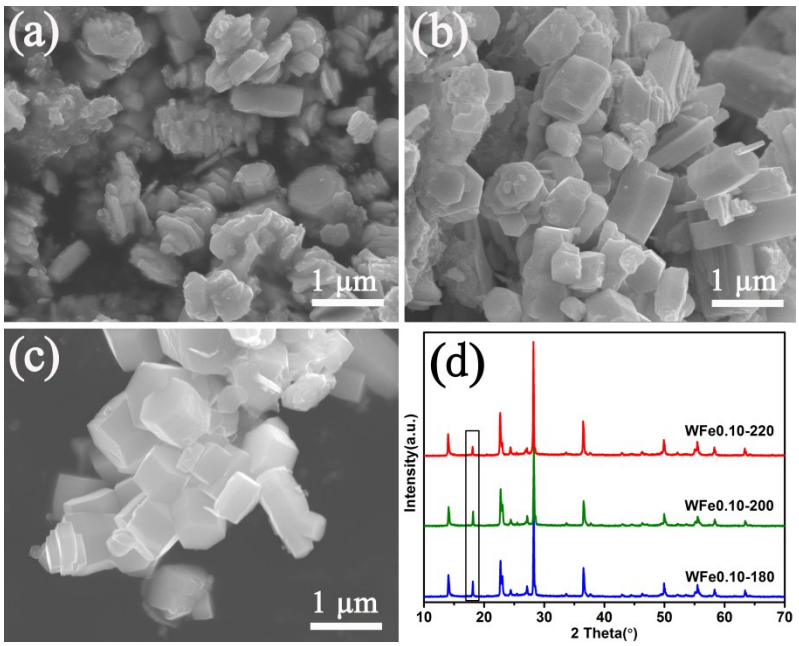

Fig. S6 The SEM images of samples obtained at different temperature with pH 2.0 for 24 h. (a) 180 °C; (b) 200 °C; (c) 220 °C; (d) the XRD spectra of three samples.

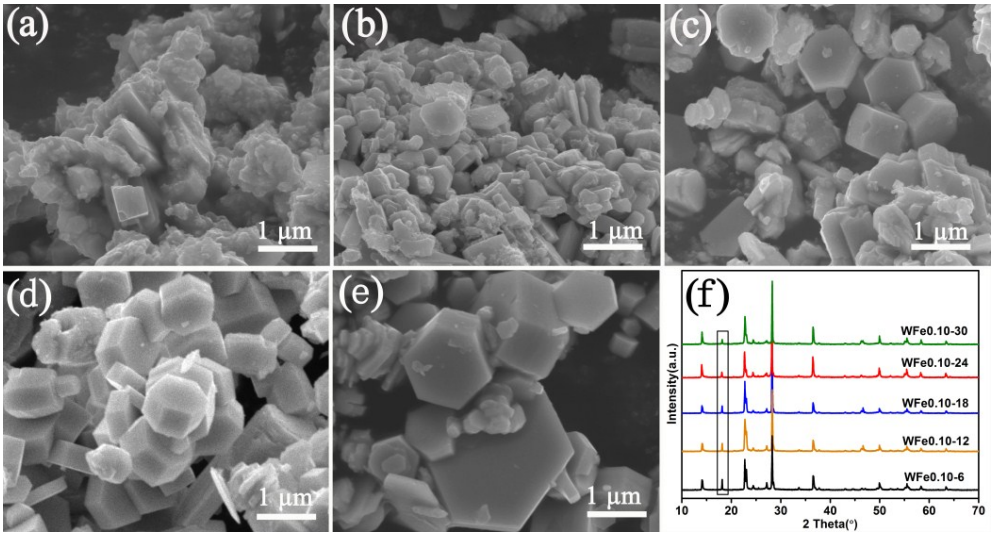

Fig. S7 The SEM images of samples obtained with different reaction time at 220 °C and pH 2.0: (a) 6 h; (b) 12 h; (c) 18 h; (d) 24 h; (e) 30 h, (f) the XRD spectra of five samples.