

Supporting Information

TiO₂/Fe₂O₃ heterostructures with enhanced photocatalytic reduction of Cr(VI) under visible light irradiation

Qiufeng Mei^a, Feiyan Zhang^a, Ning Wang^a, Yun Yang^b, Ronglan Wu^{a*} and Wei Wang^{c*}

a Key Laboratory of Oil & Gas Fine Chemicals, College of Chemistry and Chemical Engineering of Xinjiang University, Urumqi 830046, China.

b Nanomaterials and Chemistry Key Laboratory, Wenzhou University, Wenzhou 325027, China.

c. Department of Chemistry and Center for Pharmacy, University of Bergen, Bergen 5020, Norway.

*Email: Wei.wang@uib.no (Wei Wang); wuronglan@163.com (Ronglan Wu).

As two peaks of anatase TiO₂ (101) facets and hematite Fe₂O₃ (104) facets with the relative intensity of 100% are chosen as calculation targets, the phase composition of crystalline TiO₂ nanosheets/Fe₂O₃ nanocomposites can be calculated by means of the following expressions (1-3):

$$K_A^H = RIR(H)/RIR(A) \quad (1)$$

$$W_A/\% = I_A/(I_A + I_H/K_A^H) \quad (2)$$

$$W_H/\% = I_H/(I_H + I_A \times K_A^H) \quad (3)$$

Where W_A and W_H are the weight fractions of anatase TiO₂ and hematite Fe₂O₃, respectively, and I_A and I_H are the intensities of anatase (101) face and hematite (104) face peaks in the XRD spectra, respectively. From the PDF database, RIR(A) and RIR(H) are the reference intensity ratios of anatase TiO₂ and hematite Fe₂O₃ with their values at 3.3 and 2.4, respectively.

Table S1 The weight fractions of anatase TiO₂ and hematite Fe₂O₃, and zeta potentials of TiO₂, TF0.1, TF0.2, TF0.5, TF1.0, TF2.0 and Fe₂O₃.

	TiO ₂	TF0.1	TF0.2	TF0.5	TF1.0	TF2.0	Fe ₂ O ₃
$W_A/\%$	100	95.5	94.4	89.0	80.3	61.1	0
$W_H/\%$	0	4.5	5.6	11.0	19.7	38.9	100
Zeta potential/mV	-5.96	5.07	9.76	12.18	18.68	17.92	7.98

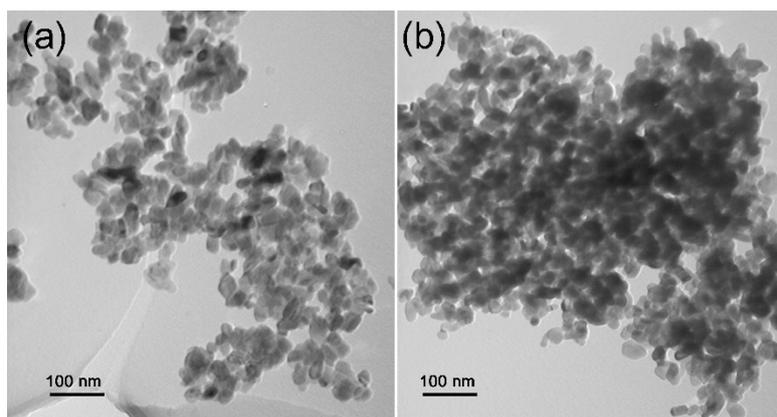


Fig. S1 TEM images of (a) TF0.1 and (b) TF2.0.

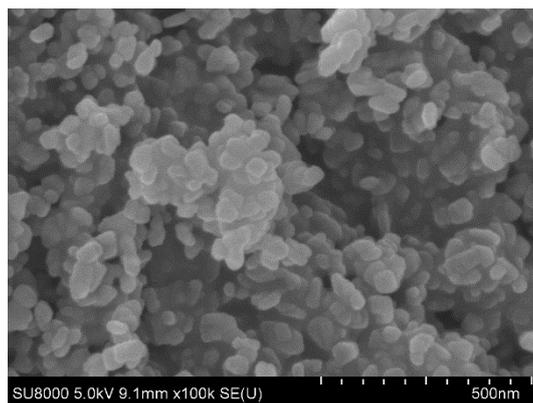


Fig. S2 SEM image of TF0.5.



Fig. S3 SAED patterns of TF0.5.

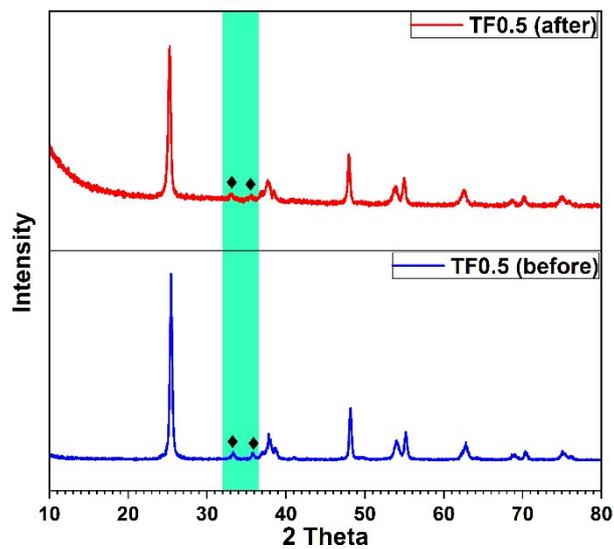


Fig. S4 XRD patterns of TF0.5 before and after cyclic photoreduction Cr(VI) experiments.

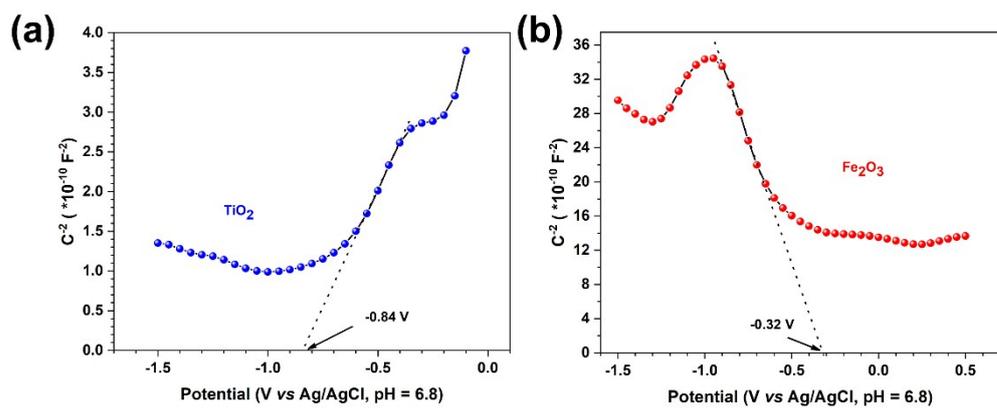


Fig. S5 the Mott-Schottky plots of TiO₂ and Fe₂O₃. The frequency is 1000 Hz.

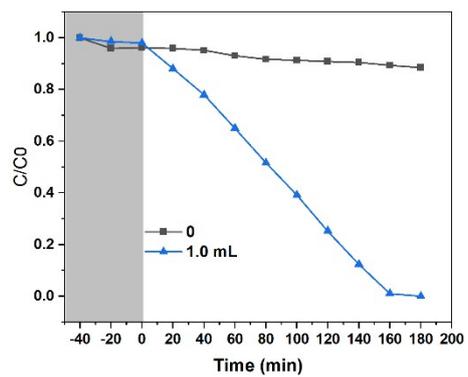


Fig. S6 Effect of citric acid on photoreduction Cr(VI) of TF0.5.