Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supporting Information

Simultaneously photocatalytic redox and removal of chromium(VI) and arsenic(III) by hydrothermal carbon-sphere@nano-Fe_3O_4

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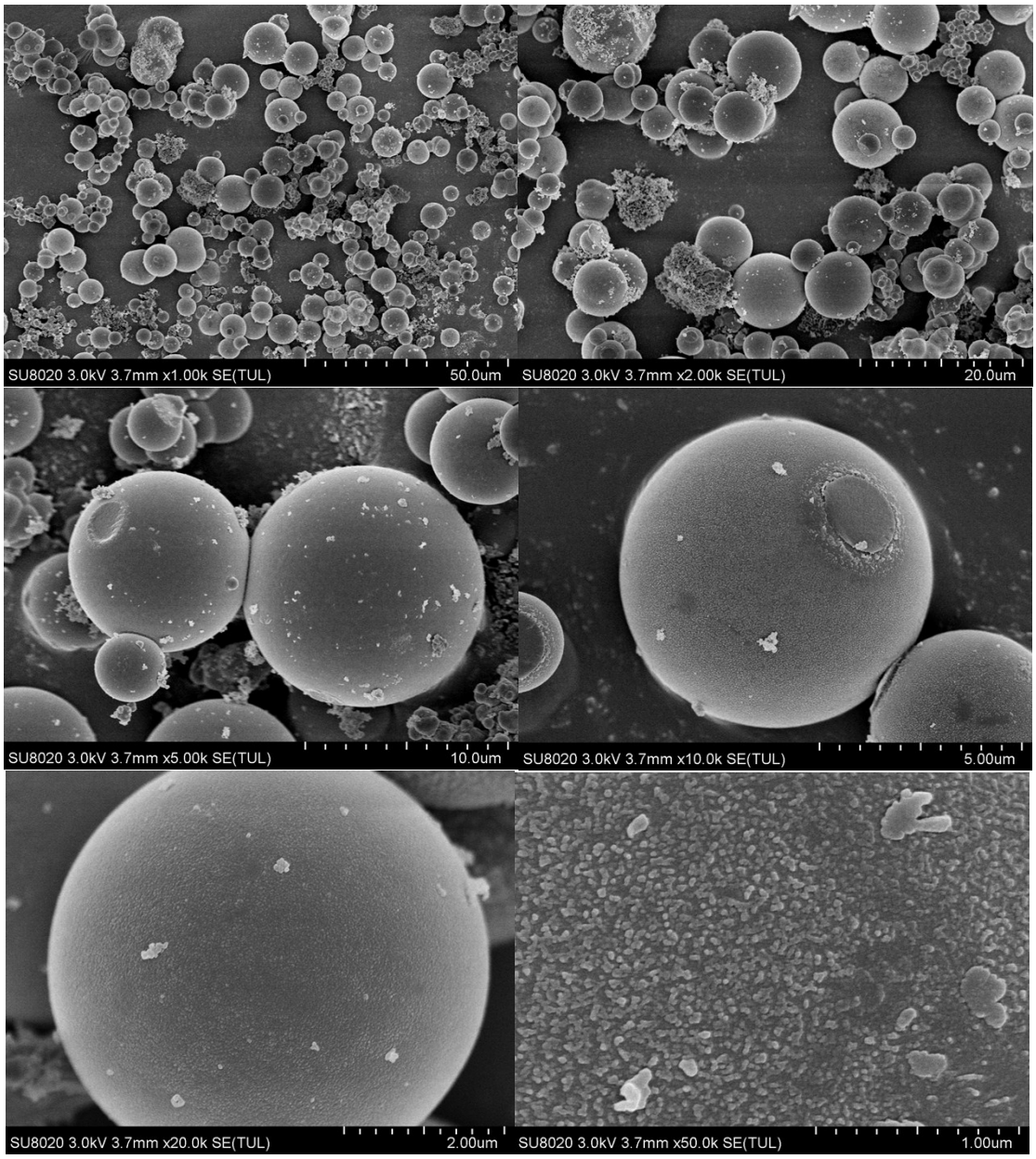
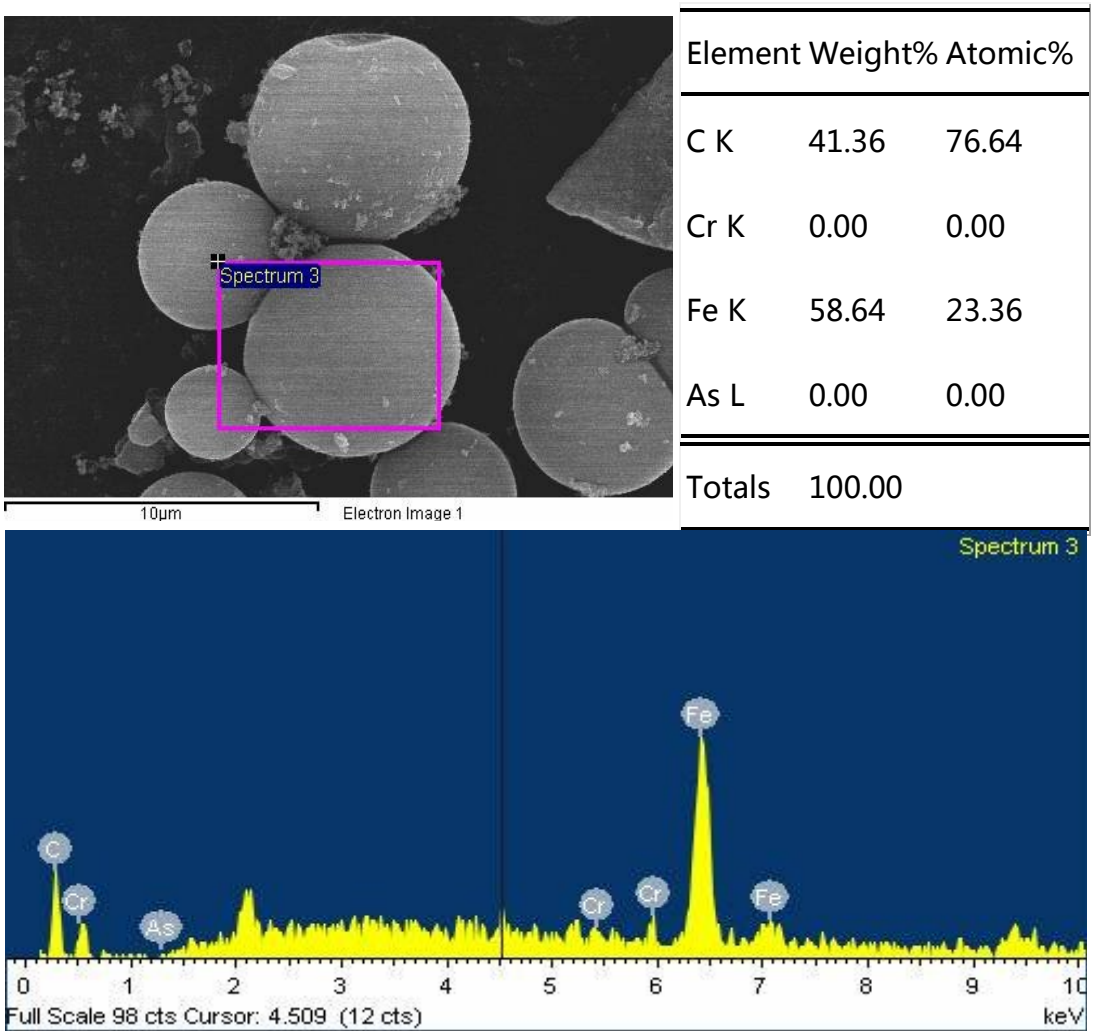


Figure S1. SEM images of fresh HCS@Fe_3O_4



Element	Weight%	Atomic%
C K	41.36	76.64
Cr K	0.00	0.00
Fe K	58.64	23.36
As L	0.00	0.00
Totals	100.00	

Figure S2. Elemental mapping images of fresh HCS@Fe_3O_4

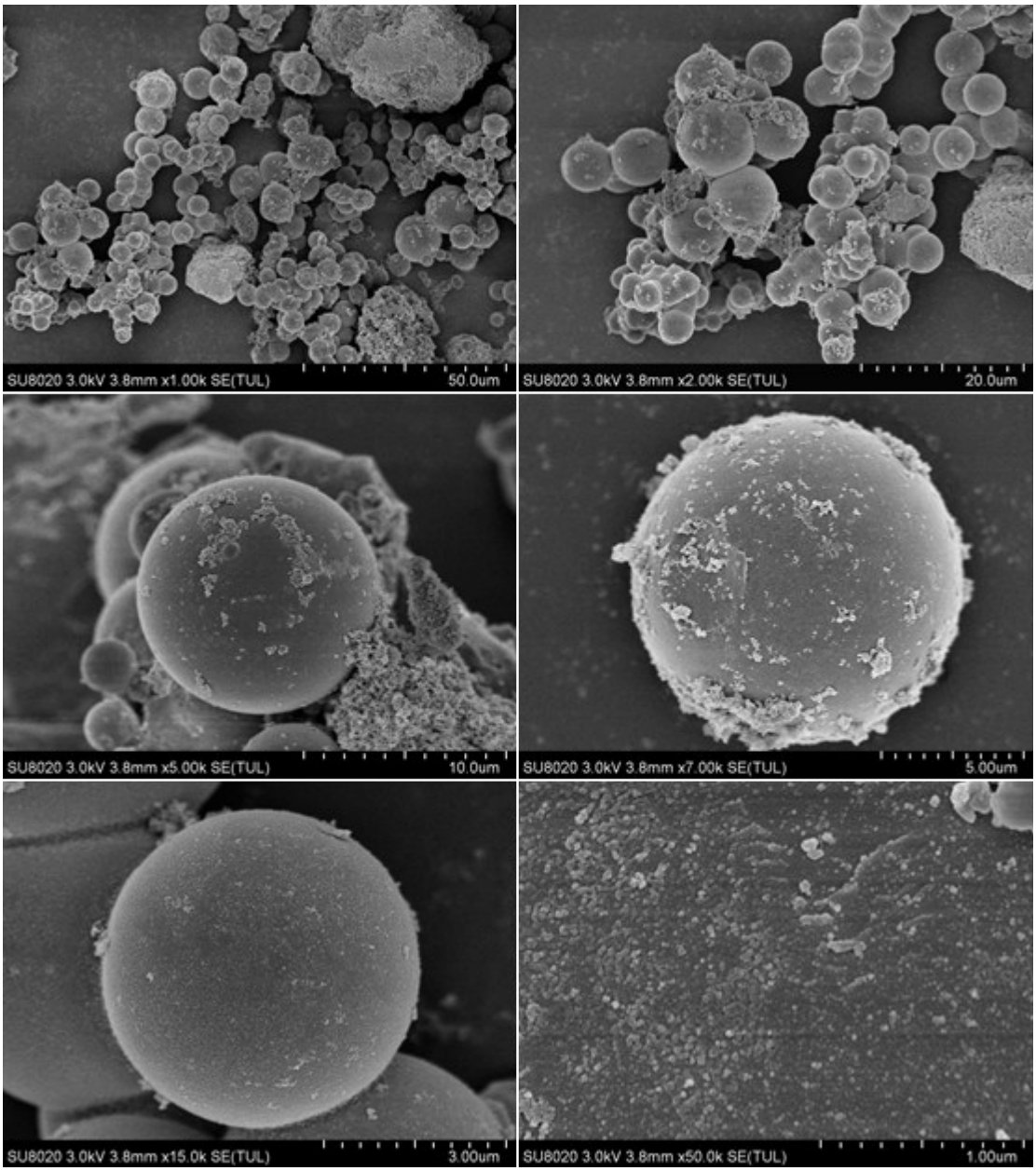
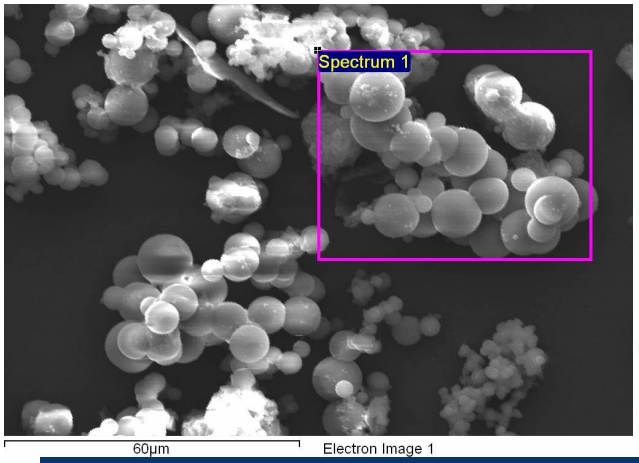


Figure S3. SEM images of used HCS@Fe_3O_4



Element	Weight%	Atomic%
C K	26.72	62.87
Cr K	4.77	2.59
Fe K	67.46	34.14
As L	1.04	0.39
Totals	100.00	

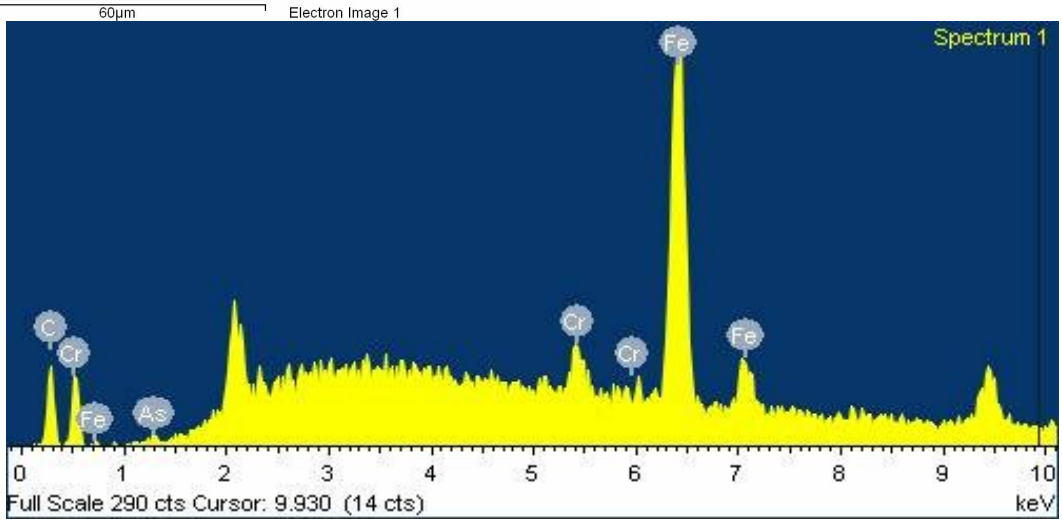


Figure S4. Elemental mapping images of used HCS@Fe_3O_4

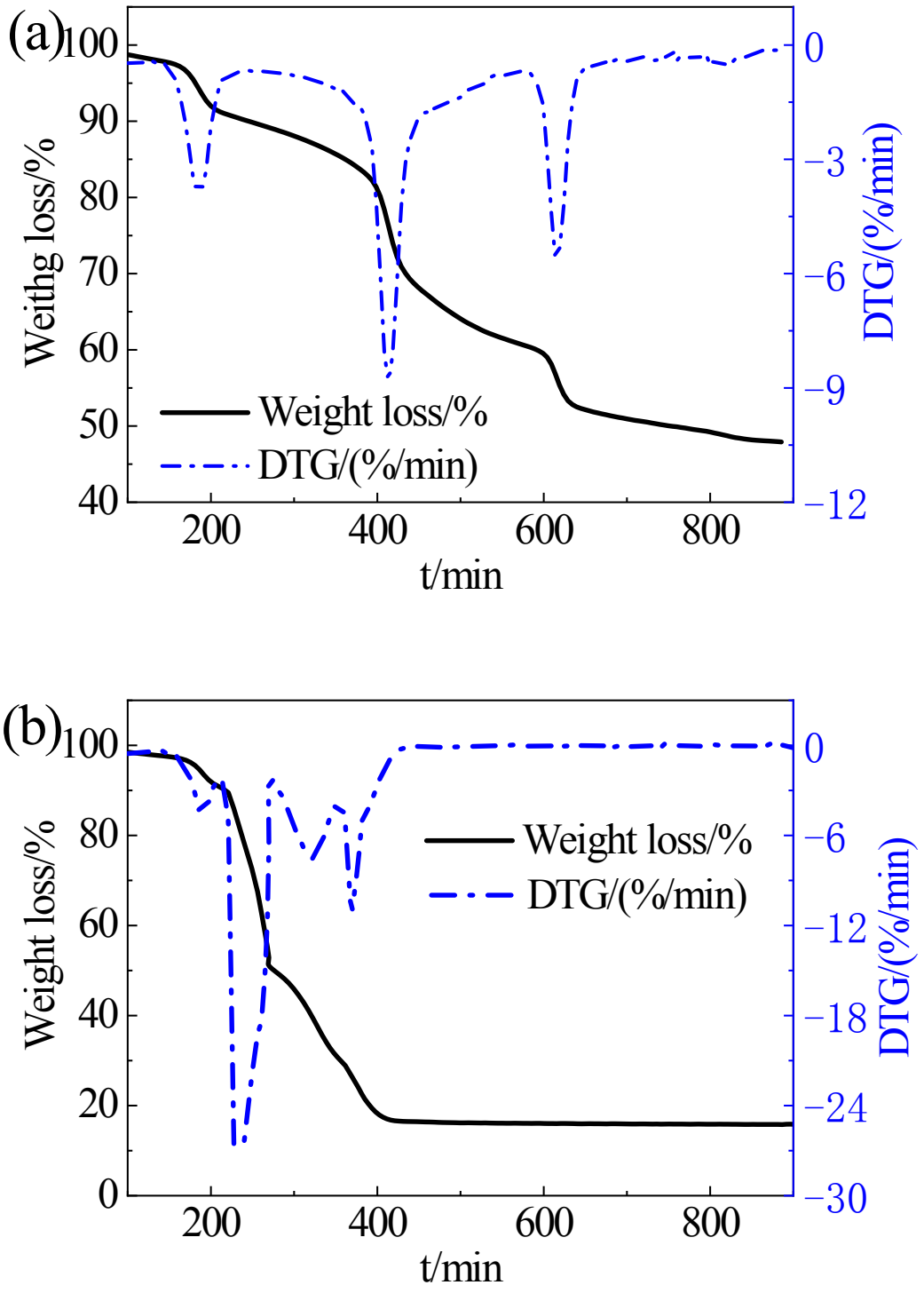


Figure S5. TGA profiles of HCS@Fe_3O_4 under nitrogen (a) and air (b).

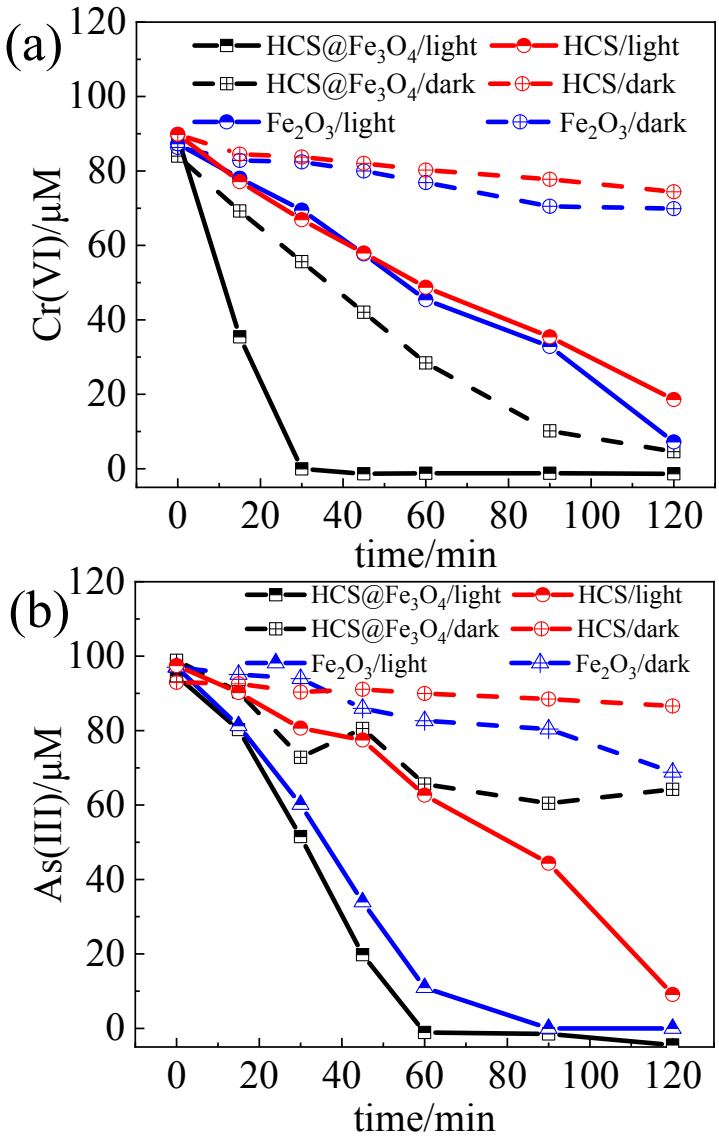


Figure S6. Simultaneously redox efficiency of Cr(VI) (a) and As(III) (b) in different systems. [Cr(VI)]=100μM, [As(III)]=100μM, cat.=0.2g/L.

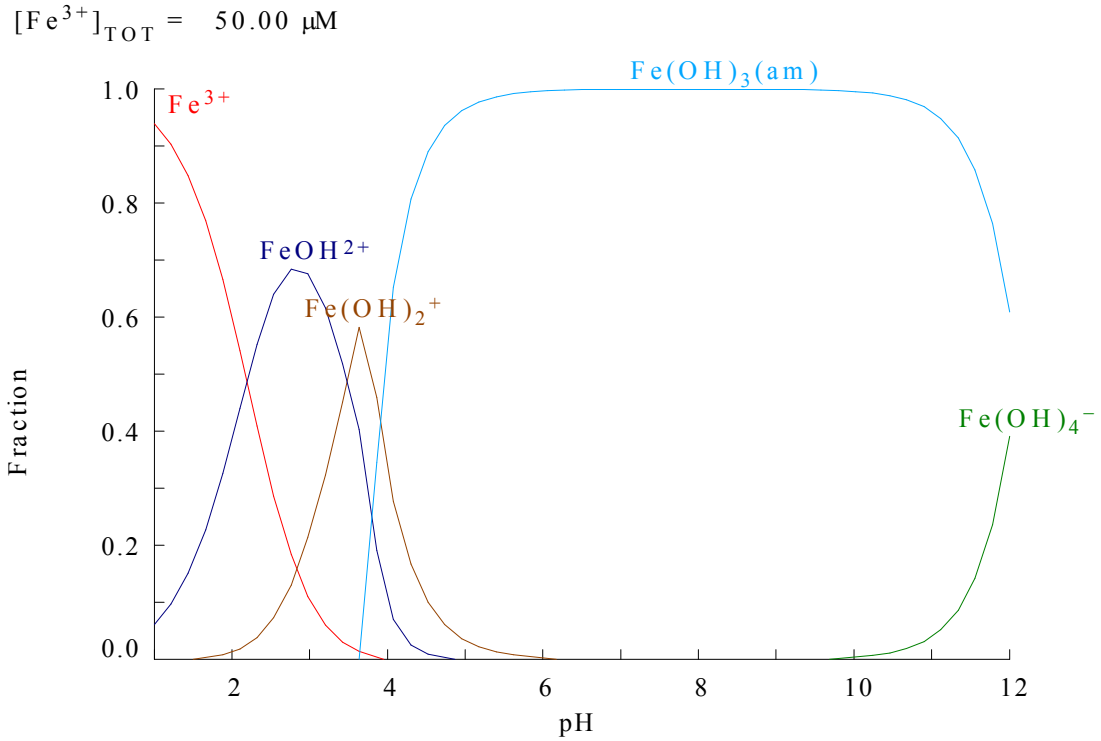


Figure S7. Distribution of Fe(III) species in solutions at different pH values.

Conditions: $[Fe^{3+}]$=50 µM

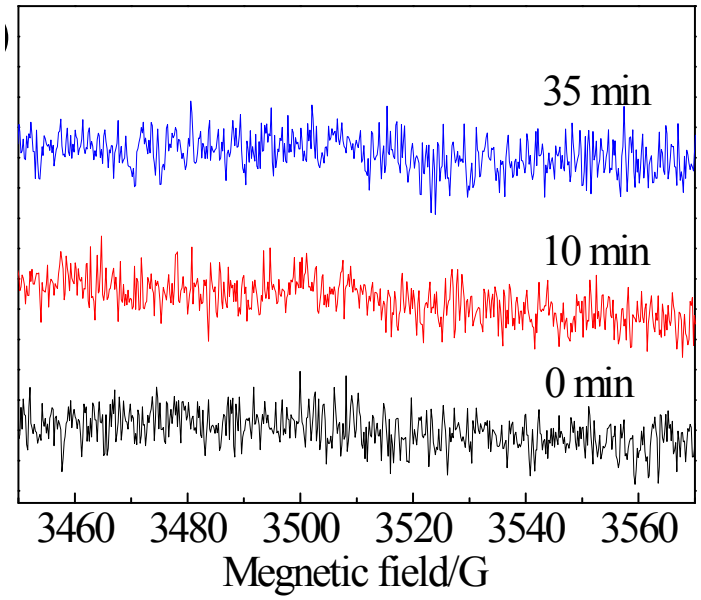


Figure S8. ESR spectra in the HCS@Fe_3O_4 system in the dark at pH 3.0.

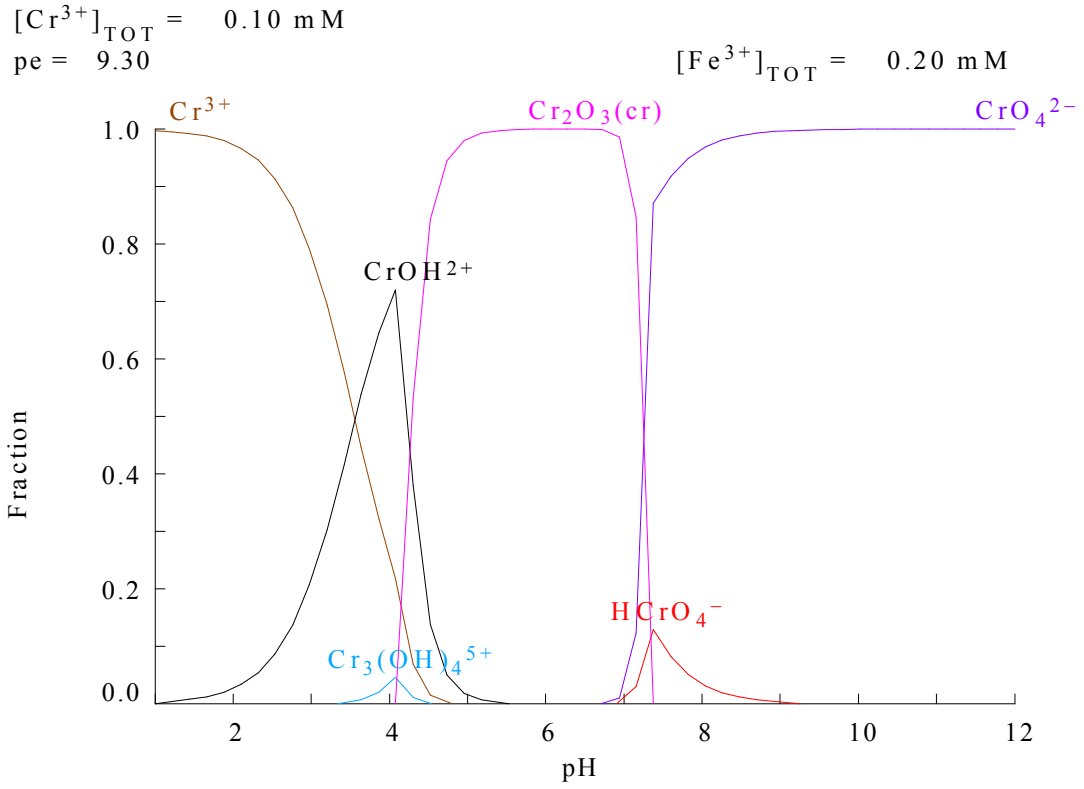


Figure S9. Distribution of Cr(III) species in solutions at different pH values.

Conditions: $[Fe^{3+}]$=200 μM, $[Cr^{3+}]$=100 μM, $[e^{-}]$=9.3 μM

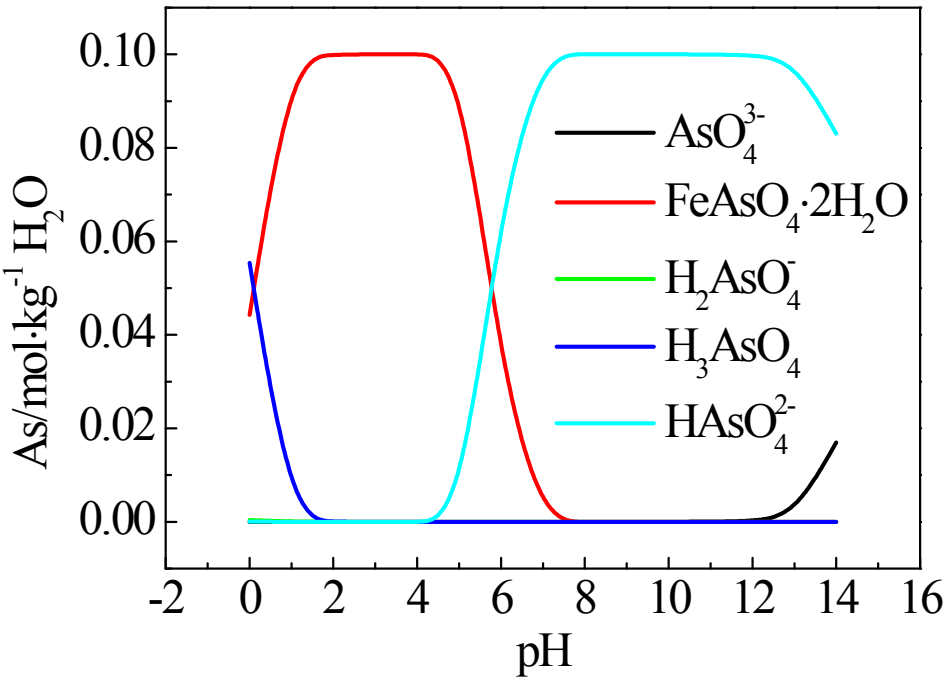


Figure S10. Species distribution of $FeAsO_4$ solution at different pH.

$[FeAsO_4]=0.1 mol \cdot kg^{-1}\ H_2O$

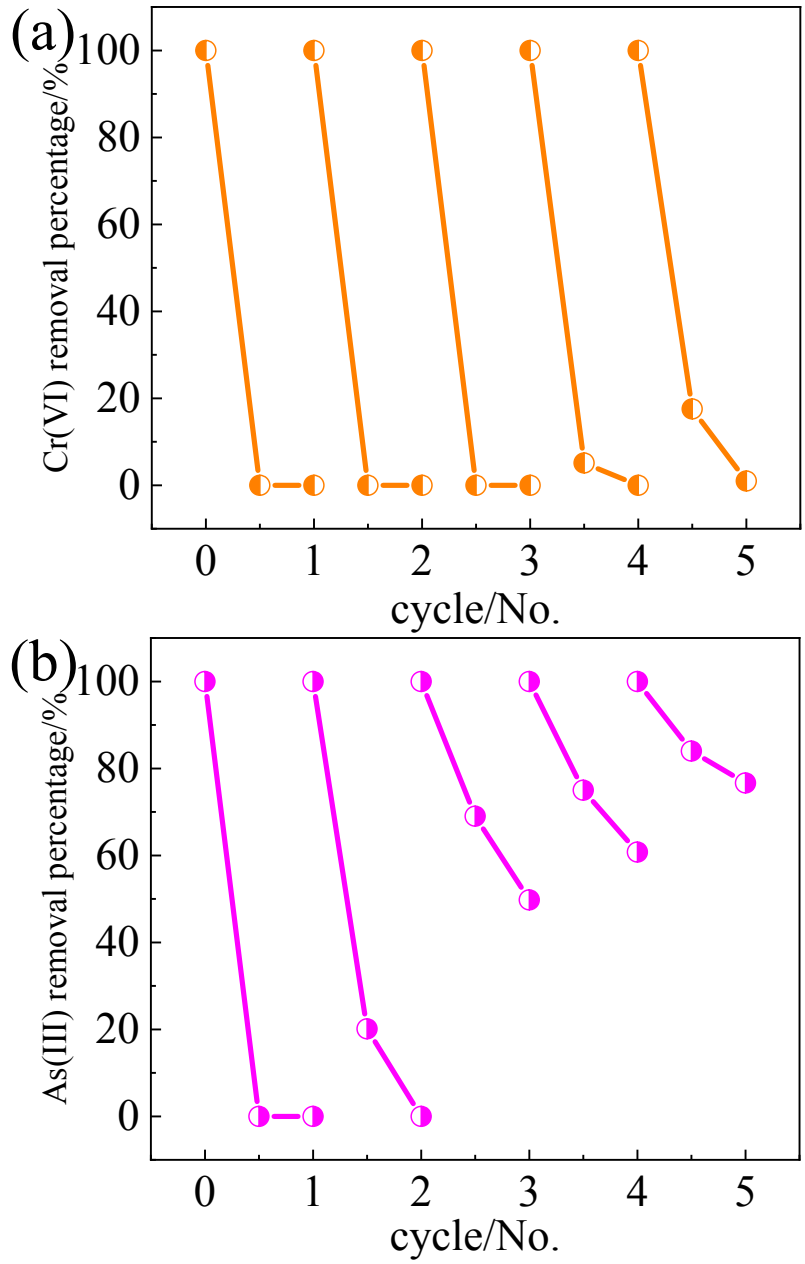


Figure S11. Cycling experiments of HCS@Fe_3O_4 for the removal percentage of Cr(VI) and As(III) under light irradiation. [Cr(VI)]=100μM, [As(III)]=100μM, HCS@Fe_3O_4=0.2g/L.

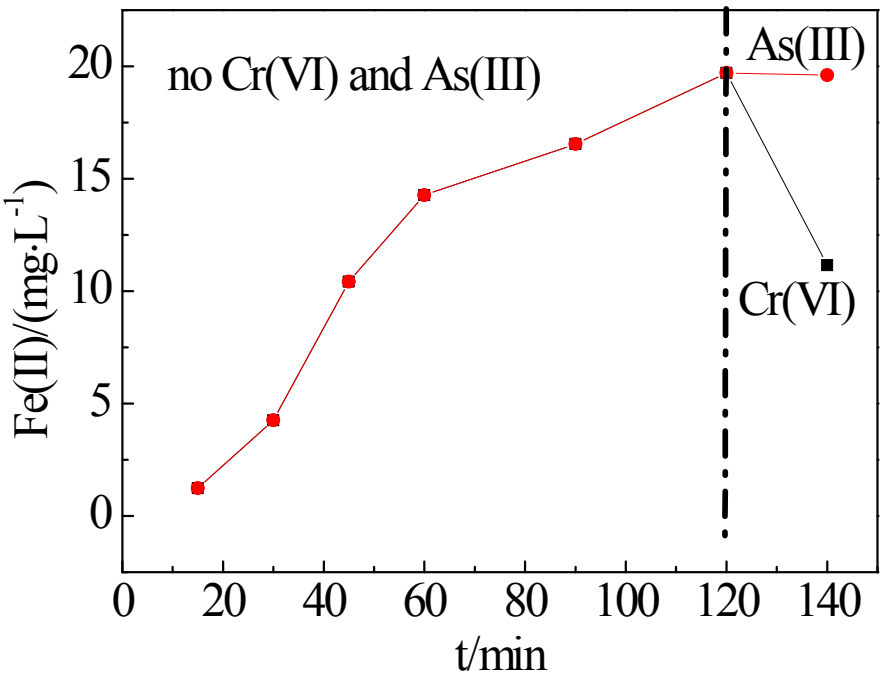


Figure S12. The release of Fe(II) in the HCS@Fe_3O_4 system and the change of Fe(II) with the addition of Cr(VI) or As(III) after 120min.