Electronic supplementary information

Insight into the high reactivity of commercial Fe-Si-B amorphous zero-valent iron in degrading azo dye solutions

Y. Tang[a], Y. Shao[a], N. Chen[a], S.Q. Chen[a], X. Liu[a], K.F. Yao[a*]

[a] School of Materials Science and Engineering, Tsinghua University, Beijing 100084, People's Republic of China

Corresponding author: **Ke-Fu Yao**. E-mail: kfyao@tsinghua.edu.cn.

Phone:+86-10-62772292. Fax: +86-10-62770190.

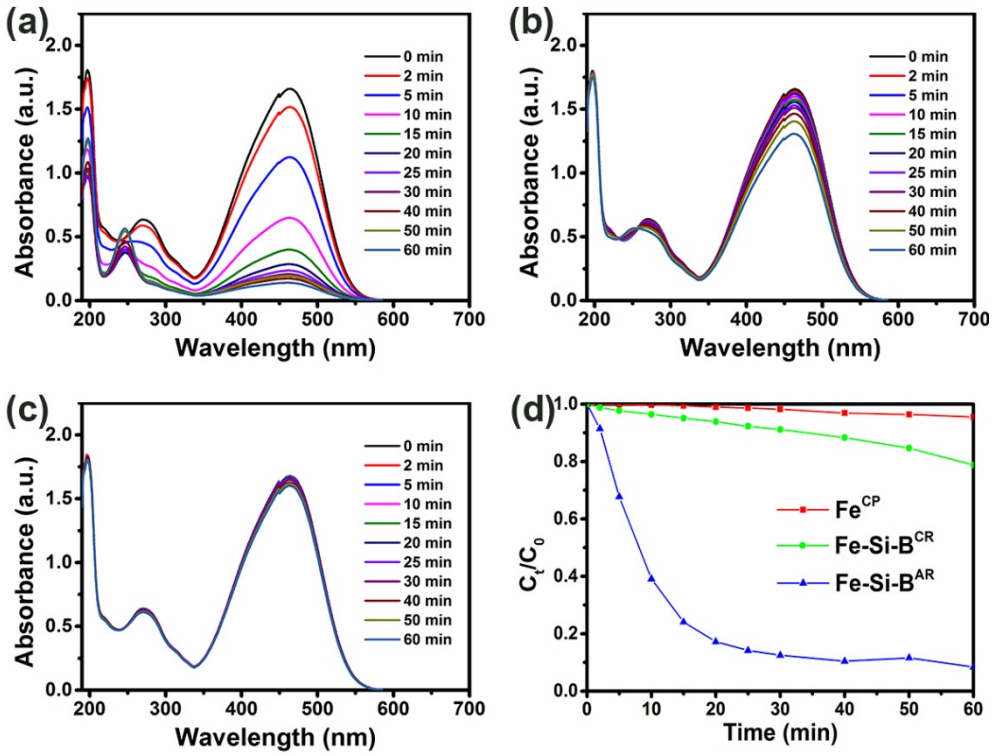
S1. XPS results for iron materials before and after decomposition.

Spectral line	Species	$Fe\text{-}Si\text{-}B^{AR}$		$Fe\text{-}Si\text{-}B^{CR}$		Fe^{CP}		$Fe\text{-}Si\text{-}B^{AD}$	
		BE (eV)	FWHM (eV)	BE (eV)	FWHM (eV)	BE (eV)	FWHM (eV)	BE (eV)	FWHM (eV)
Fe $2p_{3/2}$	Fe^0	706.6	1.05	-	-	-	-	-	-
	Fe-Si/B	707.6	1.21	707.8 708.9	1.1 1.88	-	-		
	$Fe^{n+}1$	710.3	2.35			710.2	3.07	710.5	1.79
	$Fe^{n+}1$	711.5	4.04	711.3	3.29	711.5	3.91	711.5	2.59
	$Fe_2(SO_4)_3$	-	-	-	-	-	-	713.4	2.1
O 1s	O^{2-}	529.8	0.87			529.7	1.2	530.2	1.19
	OH^-	531.	2.13	531.	2.22	531.	2.53	531.	1.93

		1		1		0		6	
	O-Si/B	532.2	1.23	533.0	1.73				
B 1s	B^0	187.7	0.83						
	B-Fe	-		189.5	1				
	B^{3+}-1	192.0	2.11	192.5	1.67			192.4	1.73
	B^{3+}-2	-		193.7	1.05				
Si 2p	Si^0	99.3	1.14					99.9	1.82
	Si_xO			100.7	1.3				
	Si^{2+}	102.4	1.81					102.4	1.68
	Si^{4+}			103.8	1.86				

The red number shown in the table is mainly due to the inaccuracy in determining the FWHM of boron.

S2. UV-vis spectroscopy and normalized concentration of Methyl Orange during the decomposition process at 25 °C, initial pH=6.



UV-vis spectroscopy ((a), (b), (c)) and normalized concentration (d) of Methyl Orange during the decomposition process: Uv-vis spectroscopy of different iron materials, (a) Fe-Si-B^{AR}; (b) Fe-Si-B^{CR}; (c) Fe^{CP}. (Experimental conditions: 25 mg/L Methyl Orange, 10 g/L ribbons or powders, 25 ^{o}C, without addition any other reagents.)