Electronic Supplementary Information

Design of iron carbon-silica composite catalysts with enhanced catalytic performance in high–temperature Fischer-Tropsch synthesis

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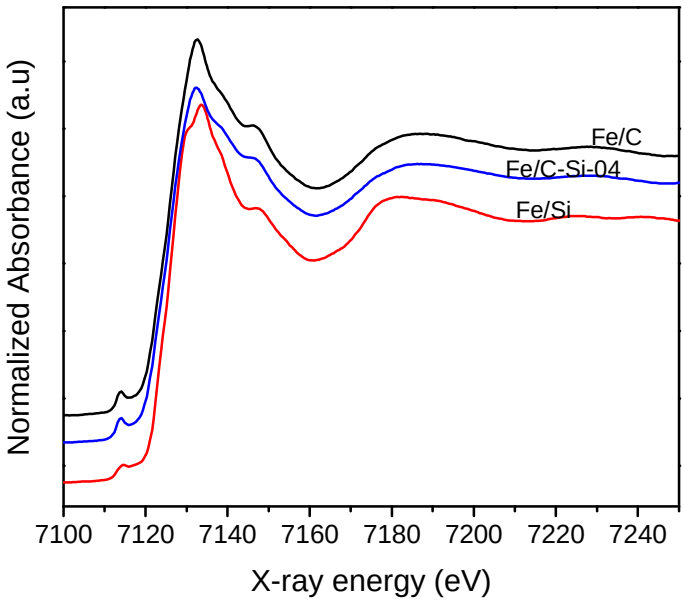

Figure S1. XANES spectra of the calcined Fe/C, Fe/C-Si-04 and Fe/Si catalysts

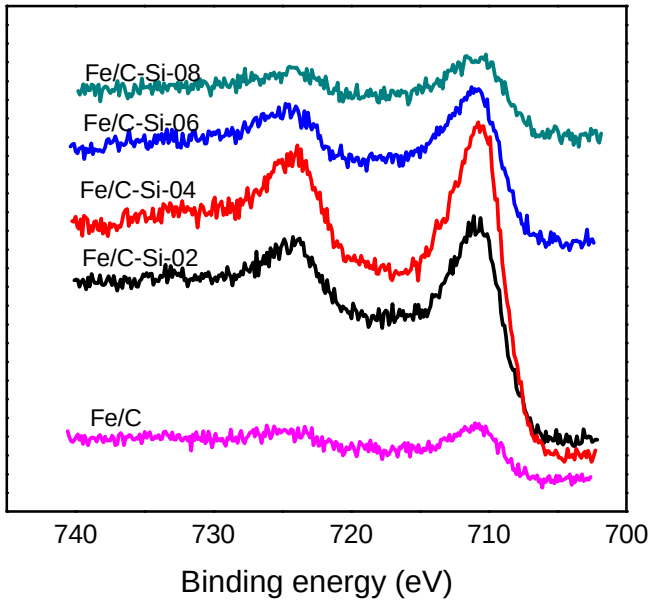

Figure S2 XPS spectra of calcined Fe/C, Fe/C-Si-02, Fe/C-Si-04, Fe/C-Si-06 and Fe/C-Si-0.8.

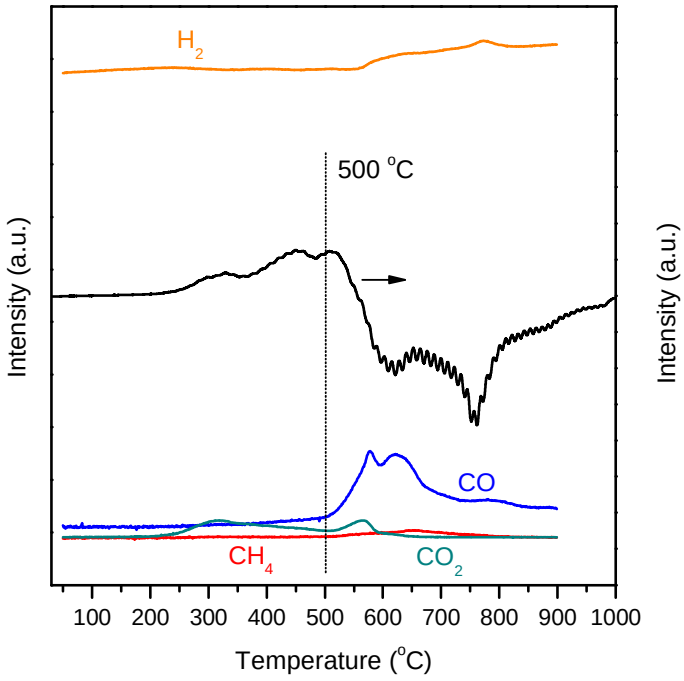

Figure S3. TPR profiles with simultaneous MS detection of desorbing products for Fe/C-Si-04 catalyst.

Table S1.

Mossbauer parameters of supported iron catalysts activated in CO.

Sample	Iron sites	HF (T)	IS (mm s^{-1})	QS (mm s^{-1})	Relative area%	Phase quantification %
Fe/Si	Fe_3C(I)	20.82	0.245	0.020	10.6	Fe_3C : 11.7 ± 2%
	Fe_3C(II)		0.359	0	1.1	χ Fe_5C_2 : 58.4 ± 2%
	χ Fe_5C_2(I)	18.66	0.207	-0.006	25.7	ε $Fe_{2:2}C$: 12.7 ± 2%
	χ Fe_5C_2(II)	22.09	0.266	0.014	32.7	Oxides : 17.2 ± 2%
	ε $Fe_{2:2}C$	17.28	0.150	0.020	12.7	
	Fe_xO_y	13.55	0.367	-0.071	11.3	
	Fe_3O_4	48.23	0.275	-0.449	5.9	
	χ Fe_5C_2(I)	21.31	0.207	0.053	20.96	χ Fe_5C_2 : 31.25 ± 10.48 %
Fe/C-Si-04	χ Fe_5C_2(II′)	17.85	0.125	-0.065	7.57	Fe_3C : 41.54 ± 10.48 %
	χ Fe_5C_2(II)	18.07	0.243	0.112	7.39	γ Fe-C : 1.06 %
	I′ -Fe_3C	20.06	0.189	-0.012	20.15	Oxides : 26.15 %
	χ Fe_5C_2(III)	13.08	0.272	-0.059	5.81	
	Fe_3O_4+Fe_2O_3	50.26	0.484	0.177	9.96	
	γ-FeOOH		0.307	0.566	8.80	
	α-FeOOH	24.54	0.201	0.012	7.39	
Fe/C	I-Fe_3C(S)	20.94	0.1123	0.041	15.52	χ Fe_5C_2 : 9.73%
	II-Fe_3C(G)	21.23	0.490	0.136	10.51	ε $Fe_{2:2}C$: 7.33%
	χ Fe_5C_2(II)	19.84	0.213	-0.094	9.73	Fe_3C : 48.74 ± 5.69%
	ε-$Fe_{2:2}C$	21.31	0.237	-0.342	7.33	Oxides : 28.22%
	I′ -Fe_3C	16.61	0.184	-0.018	3.84	Fe^{3+} : 14.56 ± 5.68%