Electronic Supplementary Information

Oxygenase mimicking immobilized iron complex catalysts for alkane hydroxylation with H_2O_2

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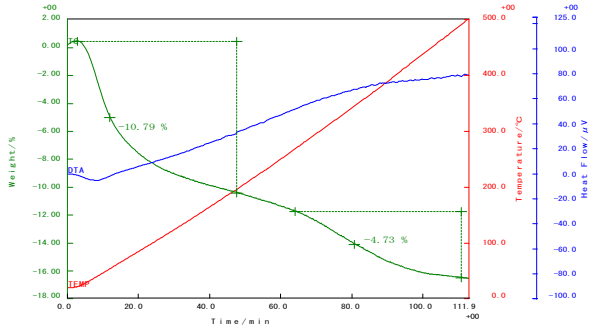
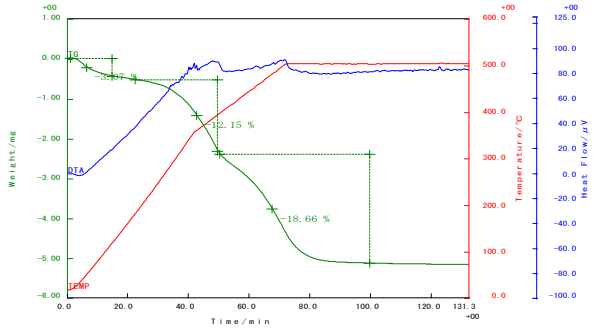
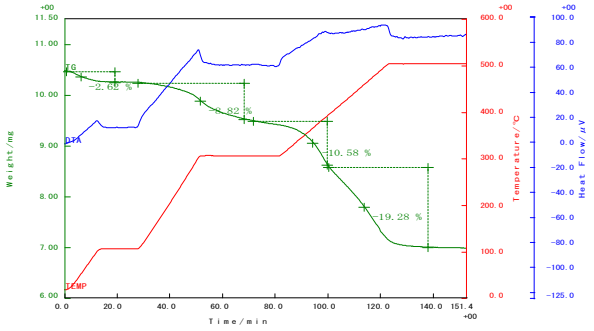
(a) **L**-SBA



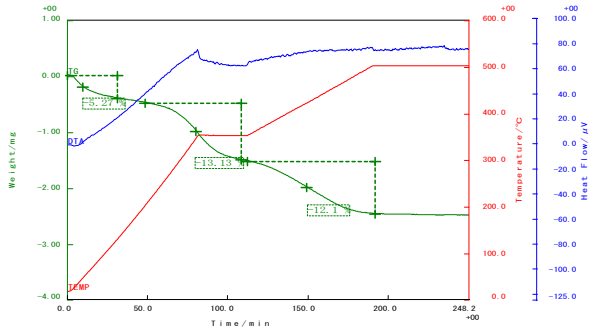
(b-1) **L**-SBA-FC(8)



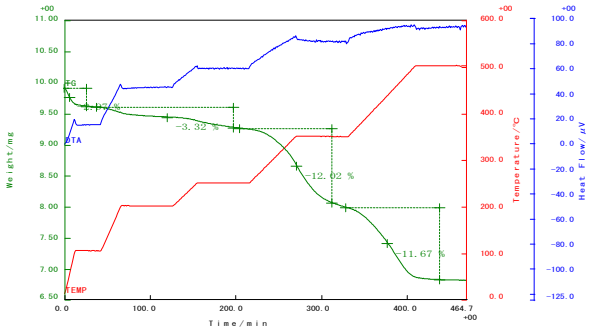
(b-2) **L**-SBA-FC(8)TMS



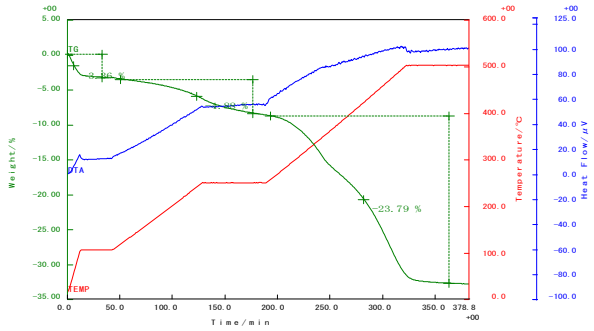
(c-1) **L**-SBA-FC(6)



(c-2) **L**-SBA-FC(6)TMS



(d-1) **L**-SBA-FC(4)



(d-2) **L**-SBA-FC(6)TMS

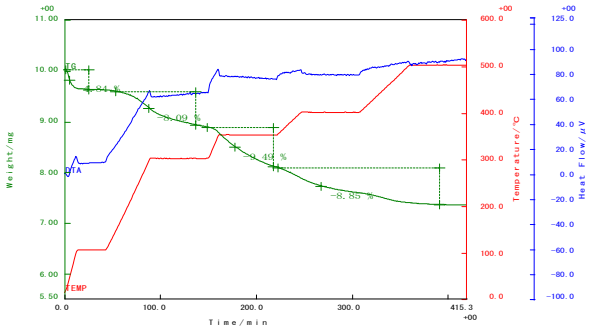


Fig. S1 TG curves of the supports.

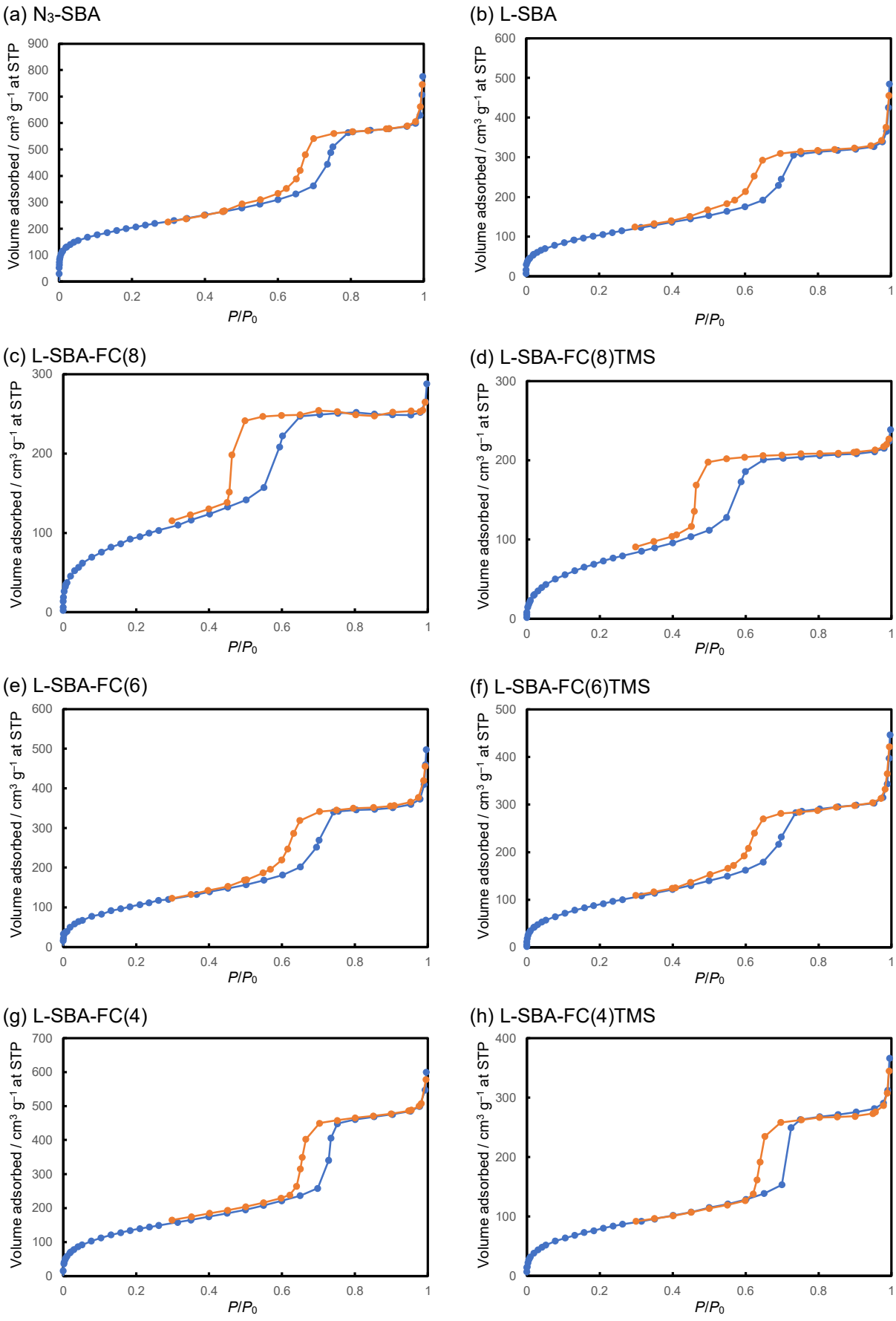


Fig. S2 N_2 isotherm adsorption curves of the supports.

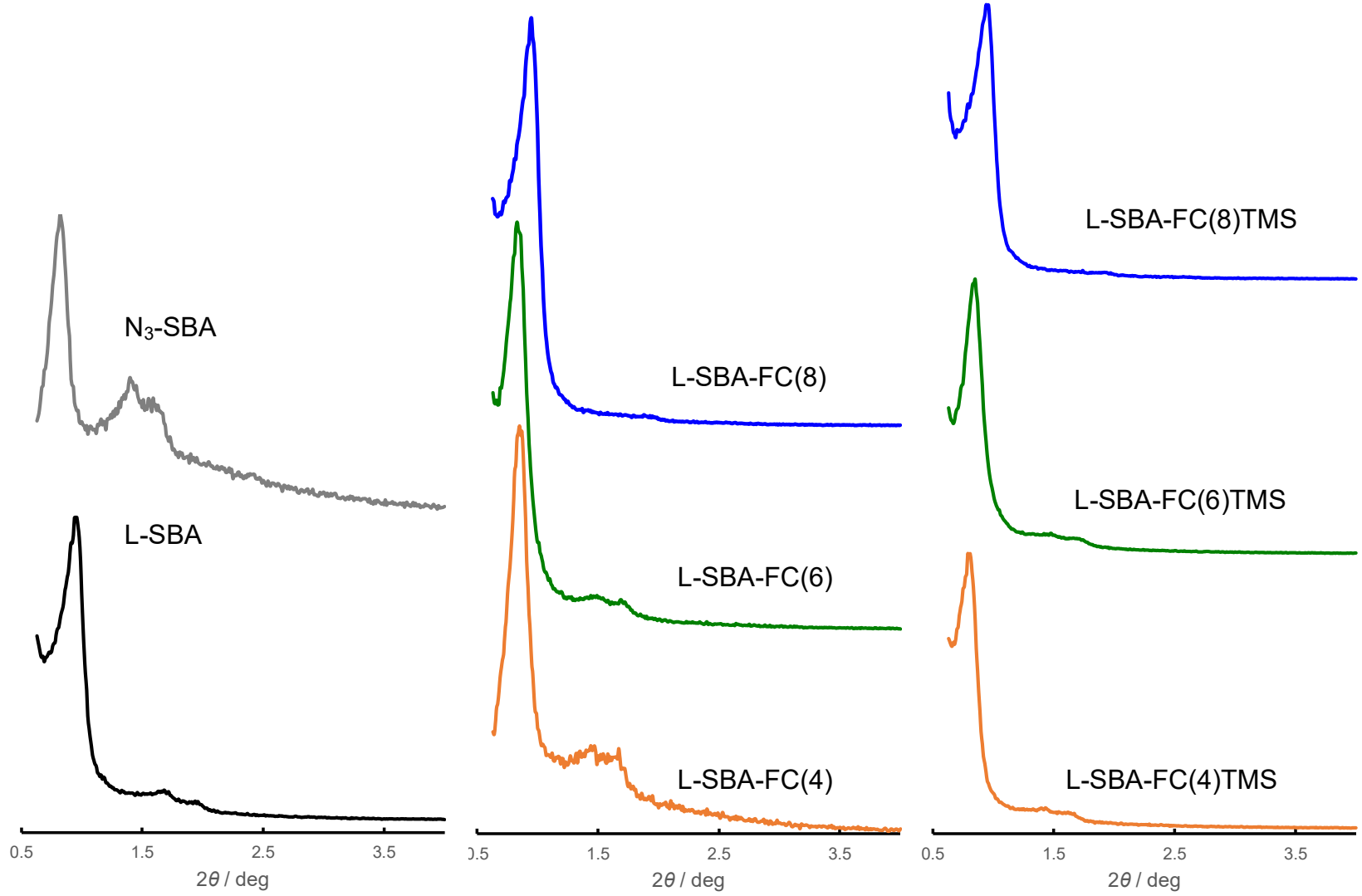


Fig. S3 PXRD of the supports.

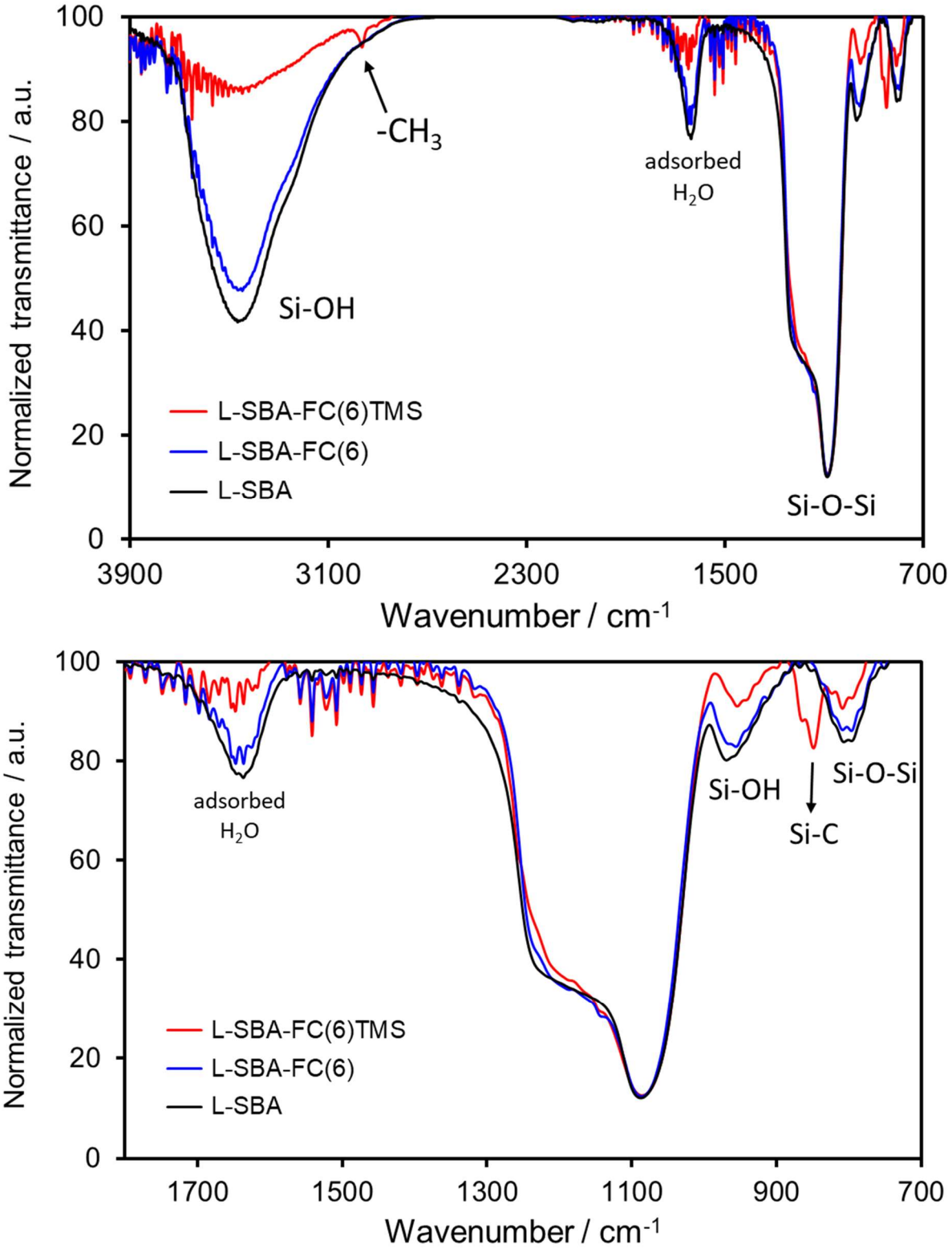


Fig. S4 IR spectra of **L**-SBA, **L**-SBA-FC(6) and **L**-SBA-FC(6)TMS.

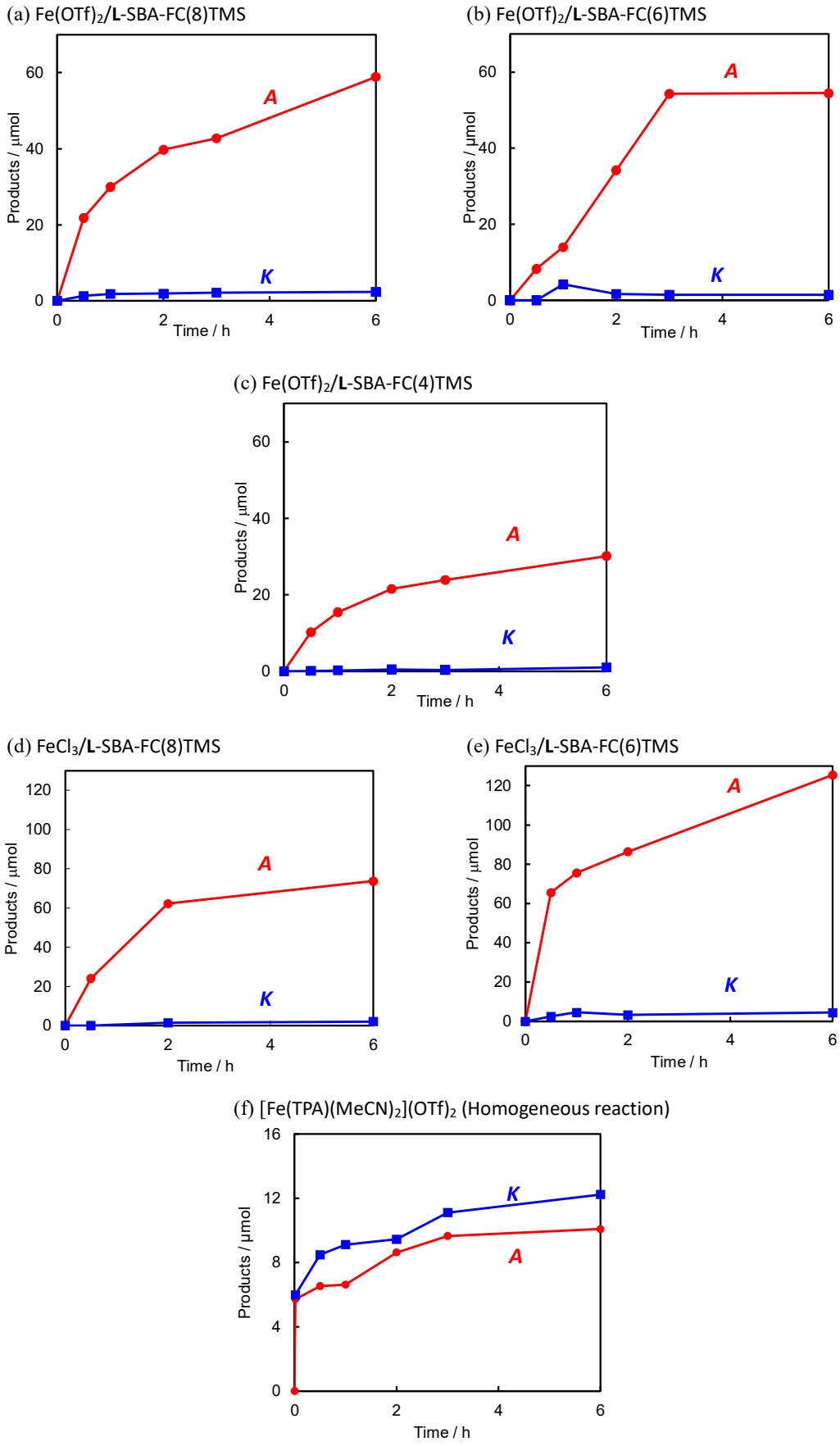
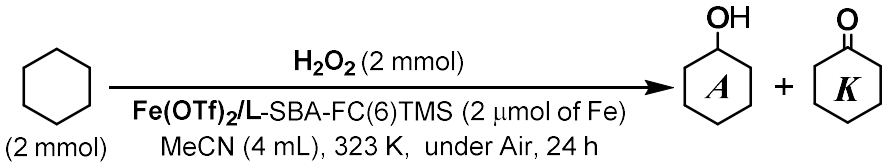
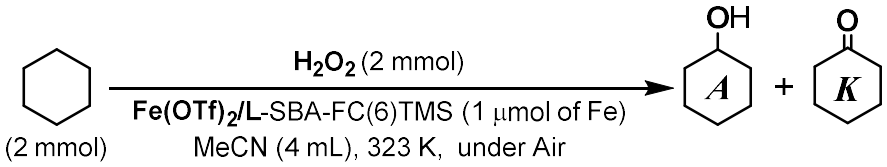


Fig. S5 Time course of the clyclohexane oxidation with H_2O_2 catalyzed by Fe(OTf)$_2$/**L**-SBA-FC(*n*)TMS (*n* = 8 (a), 6 (b), and 4 (c)), $FeCl_3$/**L**-SBA-FC(*n*)TMS (*n* = 8 (d) and 6 (e)), and [Fe(TPA)(MeCN)$_2$](OTf)$_2$ (homogeneous reaction, (f)).

Table S1 Recycle test for $Fe(OTf)_2$/**L**-SBA-FC(6)TMS



Trial	Products / TON		*A* / *K*	Relative activity
	A	*K*		
First	39.2	1.4	28.5	1
Second	32.9	3.1	10.5	0.89
Third	32.9	3.1	10.5	0.89



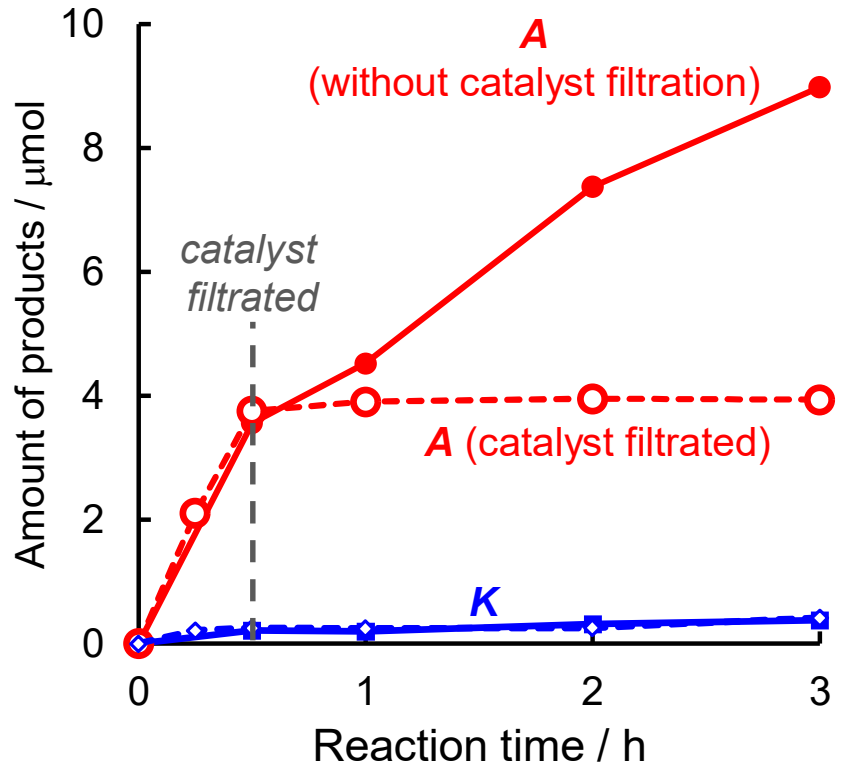
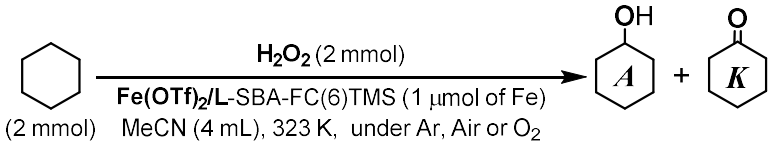


Fig. S6 Catalyst filtration test.

Table S2 Cyclohexane oxidation catalyzed by Fe(OTf)$_2$/**L**-SBA-FC(6)TMS under various under different atmospheres (argon, air, O_2).



Reaction Time /h	under Ar			under Air			under O_2		
	Yield / μmol		***A*** / ***K***	Yield / μmol		***A*** / ***K***	Yield / μmol		***A*** / ***K***
	A	***K***		***A***	***K***		***A***	***K***	
0.5	1.27	0.28	4.5	3.56	0.21	16.9	2.71	0.30	9.0
1	4.44	0.29	15.2	4.52	0.20	22.5	4.39	0.34	13.0
2	7.02	0.46	15.4	7.37	0.32	23.3	6.97	0.44	15.8
3	9.07	0.50	18.2	8.98	0.38	23.6	8.83	0.48	18.3
6	13.33	0.57	23.4	12.14	0.42	29.0	12.06	0.63	19.0

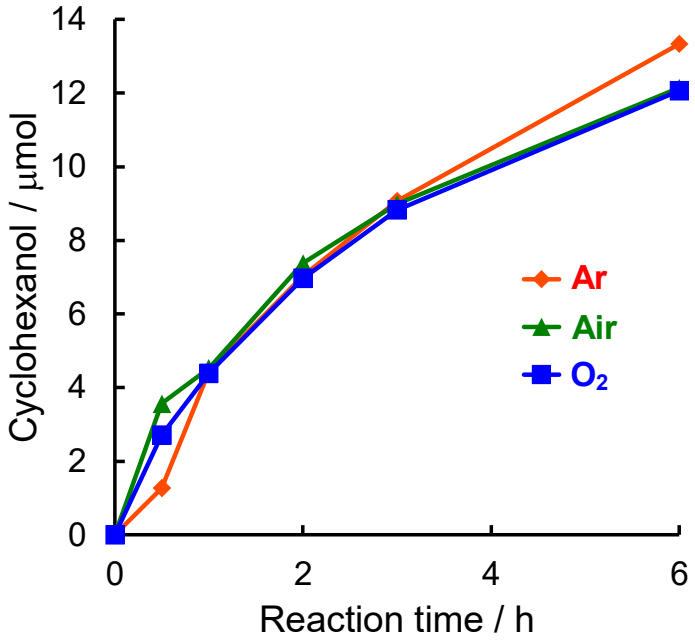


Fig. S7 Time course of the cyclohexanol production catalyzed by Fe(OTf)$_2$/**L**-SBA-FC(6)TMS.

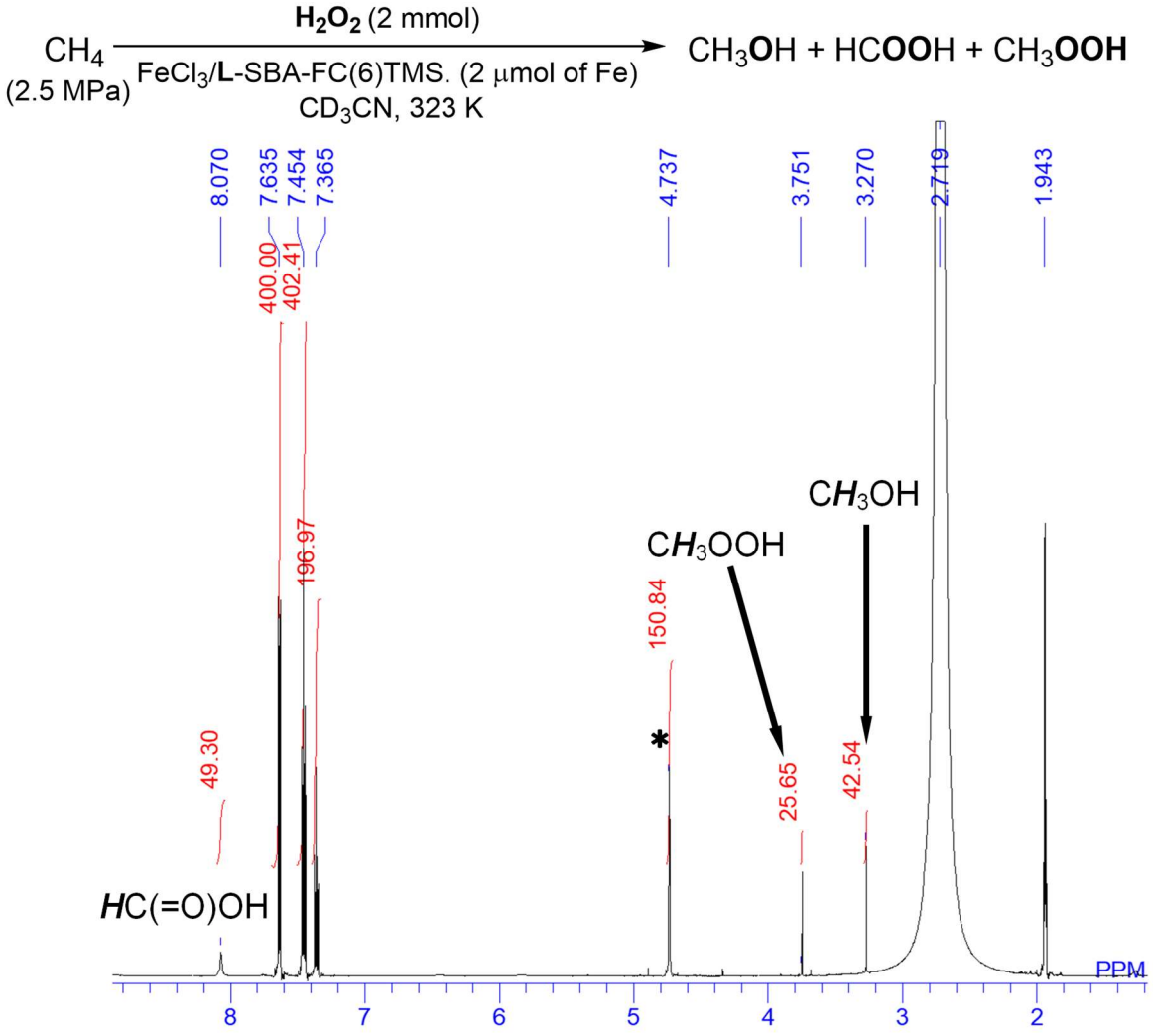


Fig. S8 ^{1}H NMR spectrum of the reaction solution of methane oxidation with H_2O_2 catalyzed by $FeCl_3$/**L**-SBA-FC(6)TMS.