Oxidative dehydrogenation of ethylbenzene on mesoporous carbon catalysts: effect of the active site number on the apparent catalytic activity

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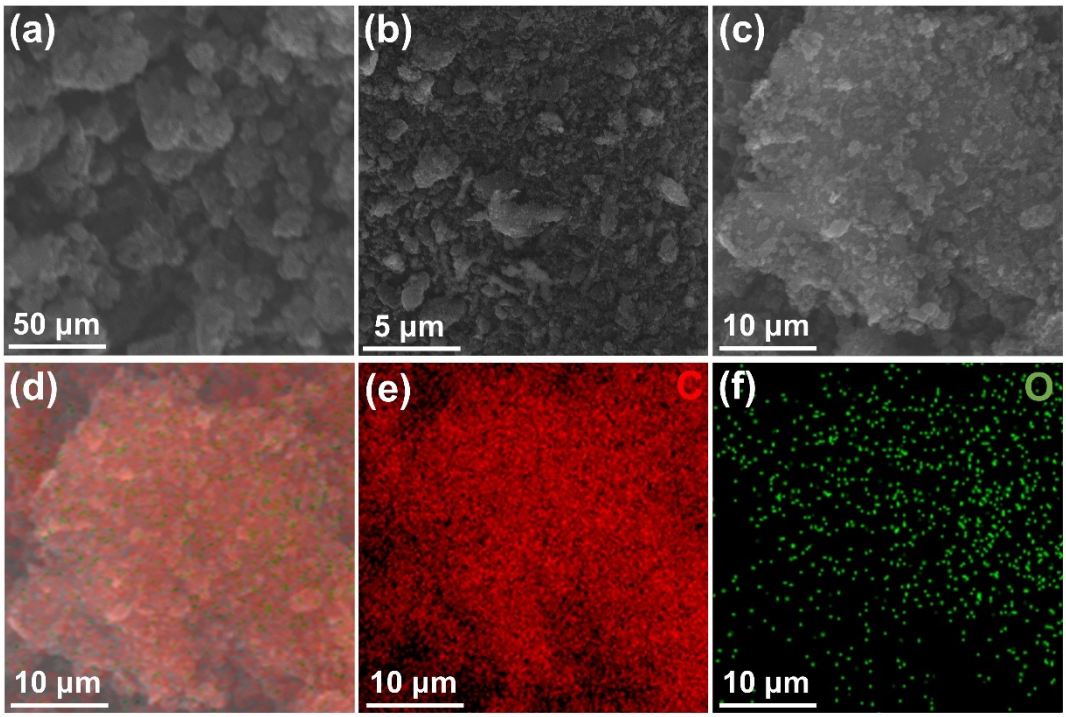

Figure S1. Morphology and element distribution of SMC-600. (a-b) SEM images. (c-f) SEM and corresponding elemental mapping images.

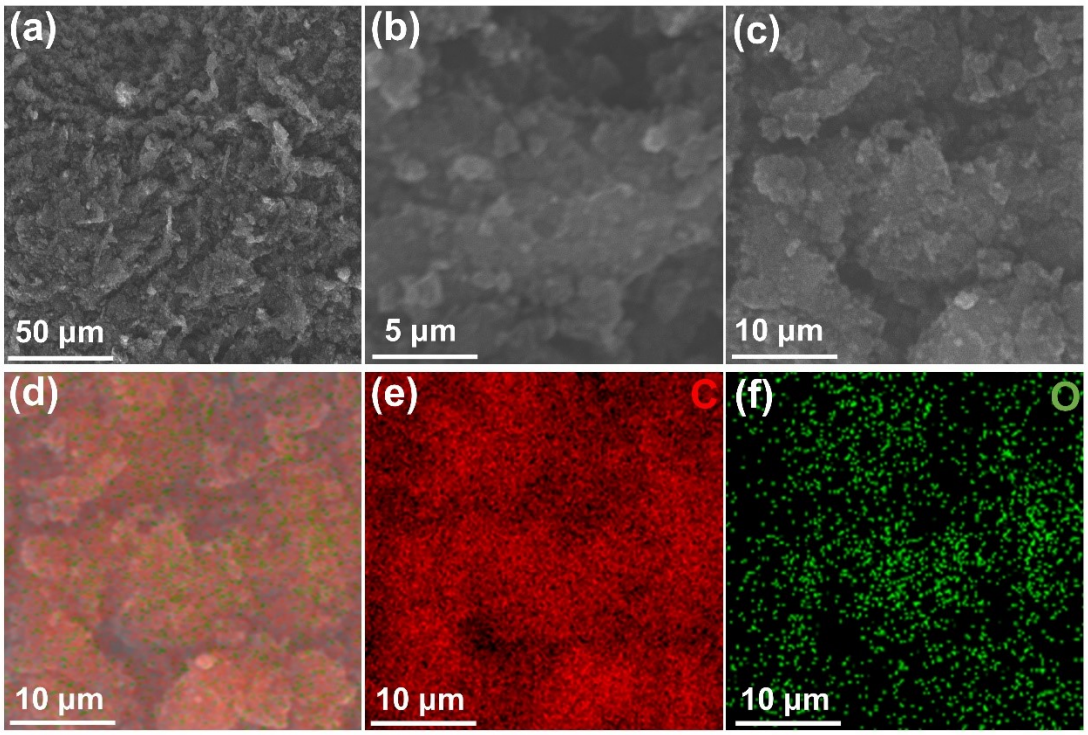

Figure S2. Morphology and element distribution of SMC-800. (a-b) SEM images. (c-f) SEM and corresponding elemental mapping images.

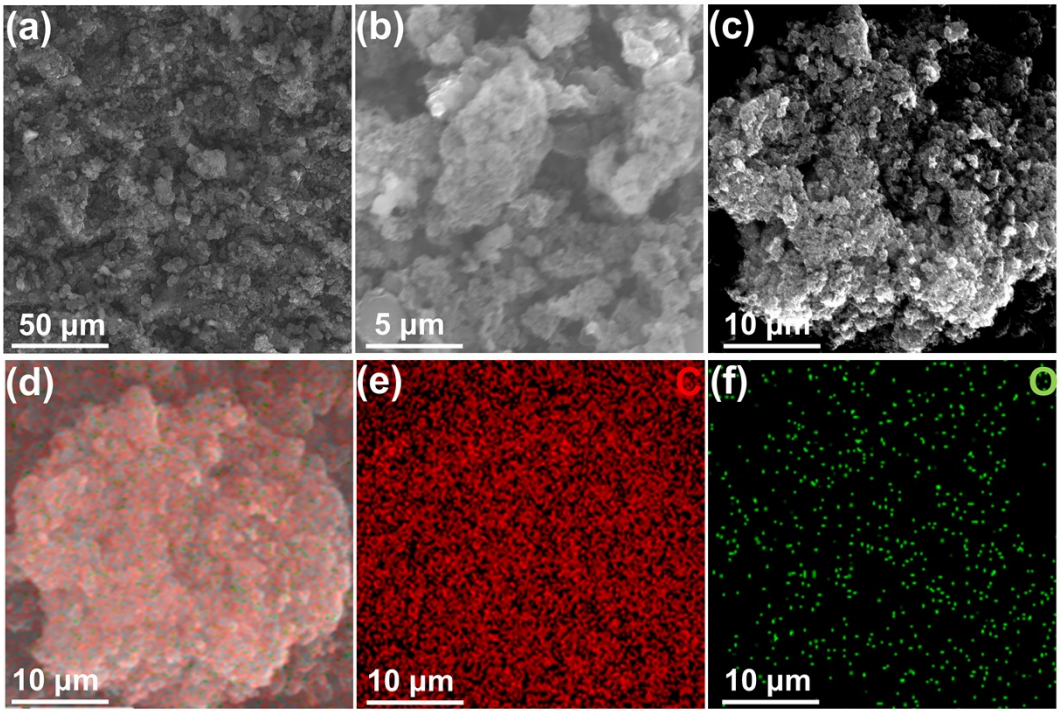

Figure S3. Morphology and element distribution of SMC-1000. (a-b) SEM images. (c-f) SEM and corresponding elemental mapping images.

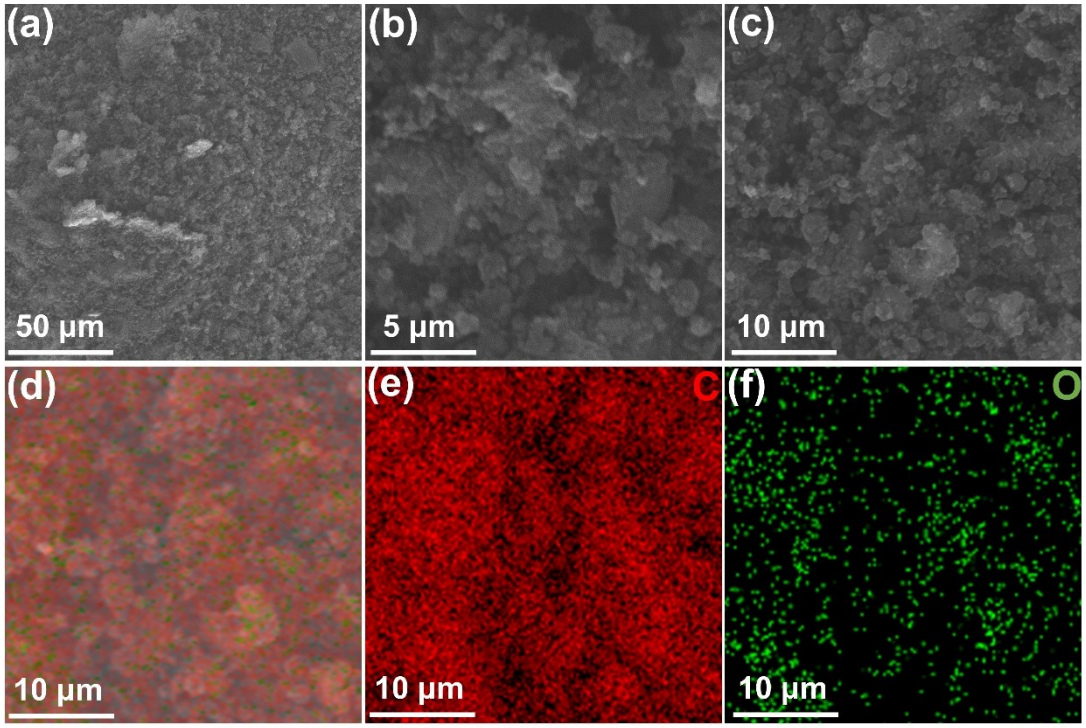

Figure S4. Morphology and element distribution of SMC-1200. (a-b) SEM images. (c-f) SEM and corresponding elemental mapping images.

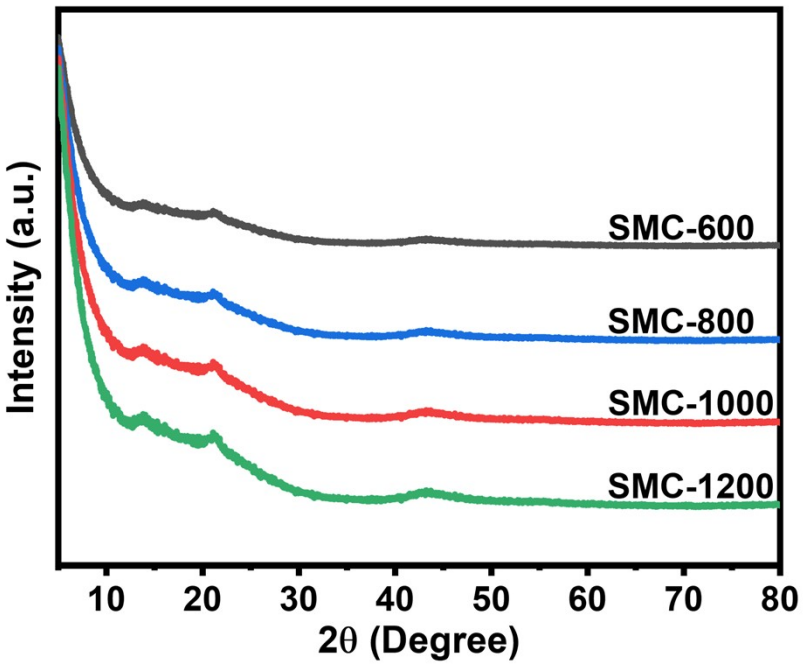

Figure S5. Powder X-ray diffraction pattern of SMC-*x*.

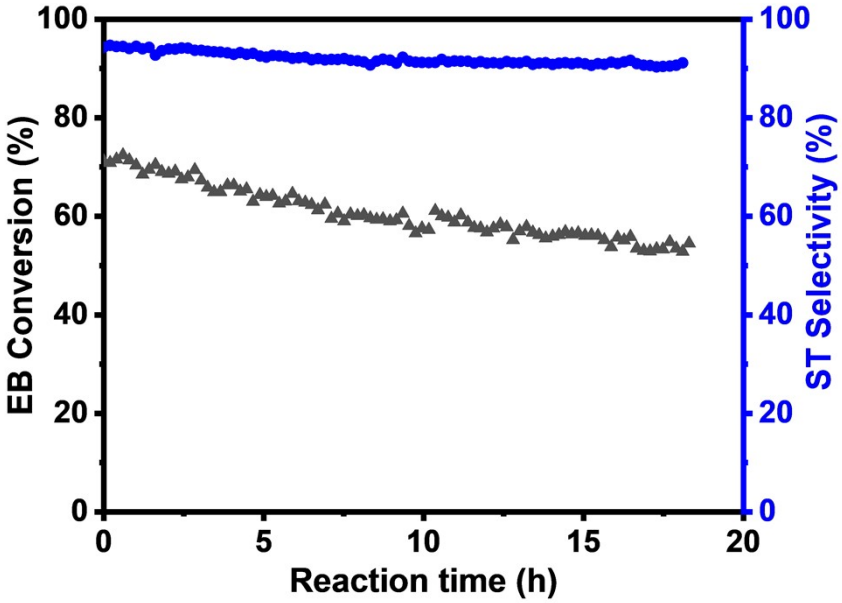

Figure S6. EB conversion and ST selectivity as a function of reaction time. Reaction conditions: 400 °C, 50 mg catalysts, 1% EB, 1% O_2, 6.12 mL/min total flow rate balanced by He, carbon balance: 100 ± 5%.

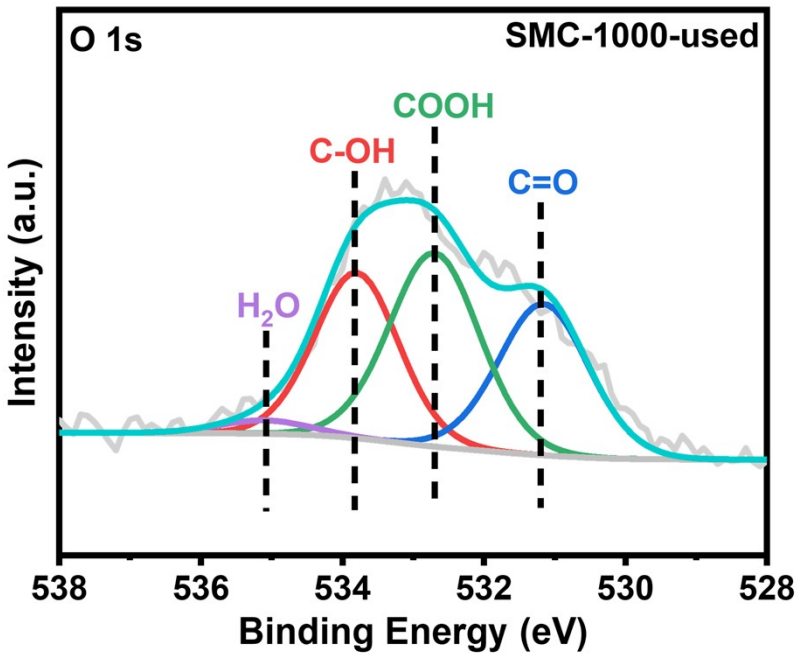

Figure S7. Deconvolution of O 1s XPS spectra of SMC-1000-used.

Table S1. The key structural parameters of SBA-15 and SMC-*x*.

Sample	BET surface area (m^2/g)	BJH pore volume (cm^3/g)	Pore size (nm)	I_D/I_G	T_{50} (°C)
SBA-15	814.9	1.7	10.2	/	/
SMC-600	659.3	0.8	4.8	1.08	504
SMC-800	726.0	0.9	5.6	0.92	549
SMC-1000	983.7	1.2	5.0	0.90	564
SMC-1200	670.8	0.8	5.4	1.01	589

Table S2. Key structural parameters of SMC-*x* samples from XPS analysis.

Parameters	Catalysts			
	SMC-600	**SMC-800**	**SMC-1000**	**SMC-1200**
Total oxygen content (at.%)[a]	2.29	3.28	4.23	3.19
C=O percent (%)[b]	27.20	23.33	24.78	24.10
Total C=O content (at.%)[c]	0.62	0.76	1.05	0.77

[a] atomic content from XPS measurement.

[b] peak area percent from deconvolution of XPS signal.

[c] atomic content from total atomic content × peak area percent (a×b).