Supplementary Information for:

Adsorption of NO on ordered mesoporous carbon and its improvement by cerium

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The XPS analysis results of Ce 3d and C 1s are summarized in Table S1 and S2. Table S1 gives the specific data and Fig. S1 shows the Ce 3d core level XP spectra, which were not shown in the article. It can been seen that more Ce^{4+} were generated with the exposure to NO and O_2, which may be due to the fact that a part of oxygen vacancy V_o was filled in the presence of O_2.

As shown in Table S2, the C 1s core level XP spectra have been resolved into four individual peaks representing graphitic carbon (C-C), carbon present in alcohol or ether groups (C-O), carboxyl or ester groups (O-C=O), and shake-up satellite peaks due to π-π* transitions in the aromatic rings. It can be seen that the proportion of C-O and O-C=O groups was increased with the introduction of cerium which was consistent with the EDX and CO/CO_2-TPD results. After the exposure to NO and O_2, the proportion of C-O group increased for both OMC and Ce-OMC. This was also consistent with the FTIR results, which showed that the surface-adsorbed species was C–O–N=O.

Table S1

Deconvolution of XPS core-level Ce 3d of the samples.

Samples	Binding energy (relative peak areas), eV (%)							
	Ce^{4+}						Ce^{3+}	
	V	V″	V‴	U	U″	U‴	V′	U′
Ce-OMC	882.2	888.6	898.0	900.7	907.2	916.15	884.4	903.9
	(18.8)	(13.4)	(8.7)	(15.9)	(9.8)	(6.7)	(17.5)	(9.2)
Ce-OMC ED	882.2	888.6	898.0	900.7	907.2	916.15	884.4	903.9
	(7.4)	(20.9)	(6.8)	(13.3)	(22.7)	(13.0)	(10.4)	(5.4)

Table S2

Deconvolution of XPS core-level C 1s of the samples.

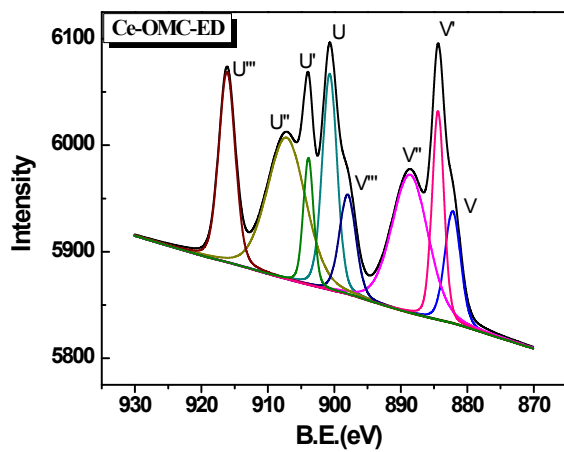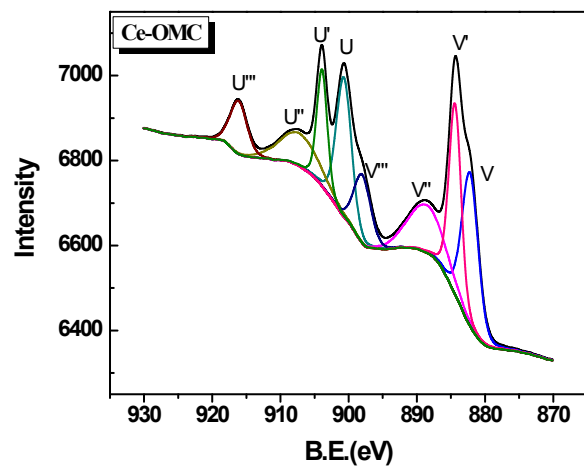| Samples	Binding energy (relative peak areas), eV (%)			
	C-C	C-O	O-C=O	$\pi\text{-}\pi^{*}$
OMC	284.5 (64.8)	286.0 (20.0)	287.5 (6.2)	290.2 (9.0)
OMC ED	284.5 (68.1)	286.2 (22.7)	288.0 (5.3)	289.9 (4.0)
Ce-OMC	284.5 (64.9)	285.9 (22.9)	288.4 (9.9)	291.0 (2.3)
Ce-OMC ED	284.4 (46.6)	286.2 (27.2)	288.0 (18.3)	289.9 (7.9)

Fig. S1 Ce 3d core level XP spectra of the Ce-OMC and Ce-OMC ED.