Supporting Information

The Effect of Ce Ion Substituted OMS-2 Nanostructure in Catalytic Activity for Benzene Oxidation

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Figure S1. The N$_2$ adsorption-desorption isotherm of the catalysts.
Figure S2. XRD diffraction pattern of the fresh CM-120 sample (a), the CM-120 sample calcined at 500 °C for 10h (b), and the CM-120 sample after 80 h catalytic reaction (c).
Figure S3. Ce3d XPS spectra of the samples.

The valence state of Ce ions in the samples is characterized by analyzing their Ce3d XPS spectra.\textsuperscript{51-3} Six peaks labeled as v, v', v'' (3d\textsubscript{5/2}), u, u', u''(3d\textsubscript{3/2}) referring to three pairs of spin-orbit doublets can be identified and they are characteristic of Ce\textsuperscript{4+} 3d final states (blue), while four peaks (noted as U\textsubscript{0}, U\textsubscript{0}', U\textsubscript{1}, U\textsubscript{1}') corresponding to Ce\textsuperscript{3+} 3d states (red).\textsuperscript{51-3} The atomic ratio of Ce\textsuperscript{3+}/(Ce\textsuperscript{3+} + Ce\textsuperscript{4+}) in CM-120, CM-180, and pure CeO\textsubscript{2} is estimated by the devolution of their Ce3d XPS spectra to be 0.31, 0.16, 0.13(Table 1), respectively, indicating most of Ce ions exist in the form of Ce\textsuperscript{4+}.

References:

