

Supporting Information

Significant Promotion Effect of Mo Additive on Novel Ce-Zr Mixed Oxide Catalyst for the Selective Catalytic Reduction of NO_x with NH₃

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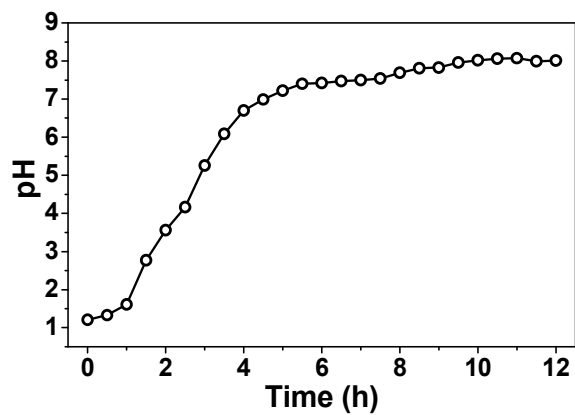


Figure S1. pH values variation during the process of the homogeneous precipitation over optimized $\text{CeMo}_{0.5}\text{Zr}_2\text{O}_x$ catalyst.

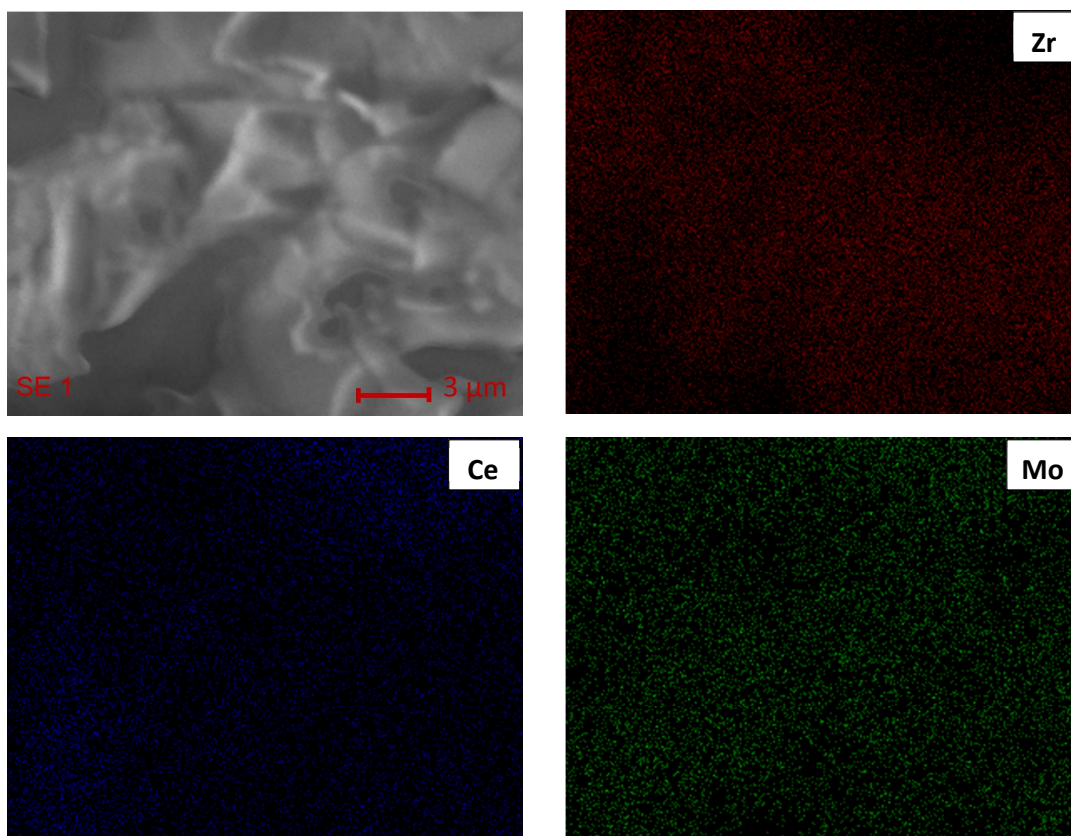


Figure S2. The distribution of Zr, Ce and Mo on $\text{CeMo}_{0.5}\text{Zr}_2\text{O}_x$ catalyst derived from SEM-EDX.

Table S1 the designed and actual bulk molar ratios on $\text{CeMo}_a\text{Zr}_2\text{O}_x$ series catalysts prepared by a homogeneous precipitation method

samples	designed molar ratio (Ce : Mo : Zr)	actual molar ratio (Ce : Mo : Zr)
CeZr_2O_x	1 : 0.0 : 2	1 : 0.00 : 1.69
$\text{CeMo}_{0.1}\text{Zr}_2\text{O}_x$	1 : 0.1 : 2	1 : 0.02 : 1.40
$\text{CeMo}_{0.5}\text{Zr}_2\text{O}_x$	1 : 0.5 : 2	1 : 0.42 : 1.72
$\text{CeMo}_{1.0}\text{Zr}_2\text{O}_x$	1 : 1.0 : 2	1 : 0.75 : 1.52
$\text{CeMo}_{1.5}\text{Zr}_2\text{O}_x$	1 : 1.5 : 2	1 : 1.03 : 1.41

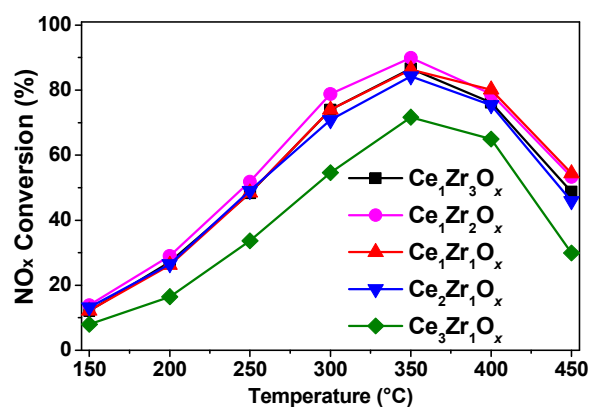


Figure S3. NO_x conversion in NH_3 -SCR reaction as a function of temperature over CeZrO_x series catalysts. Reaction conditions: $[\text{NO}] = [\text{NH}_3] = 500$ ppm, $[\text{O}_2] = 5$ vol.%, GHSV = $50,000 \text{ h}^{-1}$.

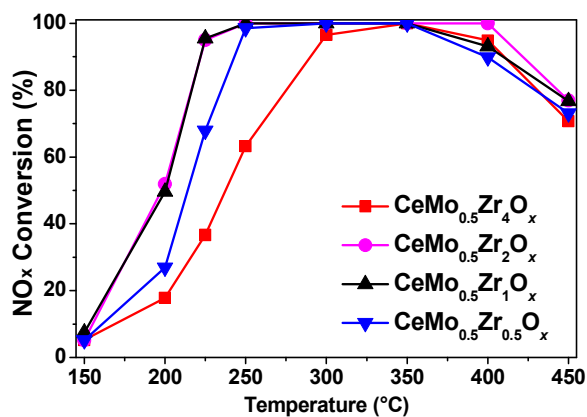


Figure S4. NO_x conversion in NH₃-SCR reaction as a function of temperature over CeMo_{0.5}Zr_bO_x ($b = 0.5, 1.0, 2.0, 4.0$) catalysts. Reaction conditions: [NO] = [NH₃] = 500 ppm, [O₂] = 5 vol.%, GHSV = 50,000 h⁻¹.

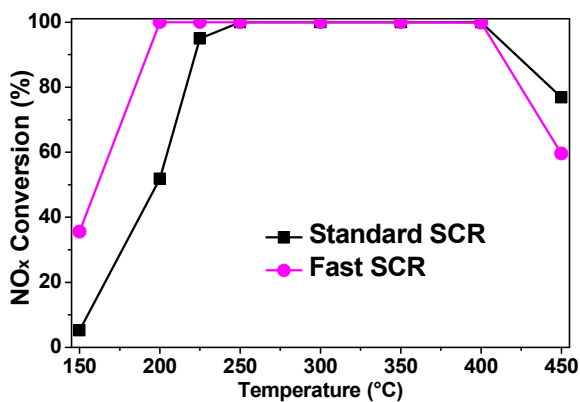


Figure S5. NO_x conversion in NH₃-SCR reaction as a function of temperature over V₂O₅-WO₃/TiO₂ catalysts with various V₂O₅ contents. Reaction conditions: [NO] = 500 ppm (or [NO] = 250 ppm, [NO₂] = 250 ppm), [NH₃] = 500 ppm, [O₂] = 5 vol.%, GHSV = 50,000 h⁻¹.

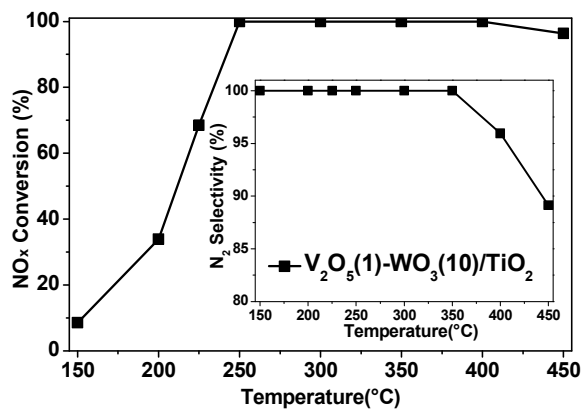


Figure S6. NO_x conversion and N₂ selectivity (inserted) in NH₃-SCR reaction as a function of temperature over V₂O₅(1)-WO₃(10)/TiO₂ catalyst. Reaction conditions: [NO] = [NH₃] = 500 ppm, [O₂] = 5 vol.%, GHSV = 50,000 h⁻¹.

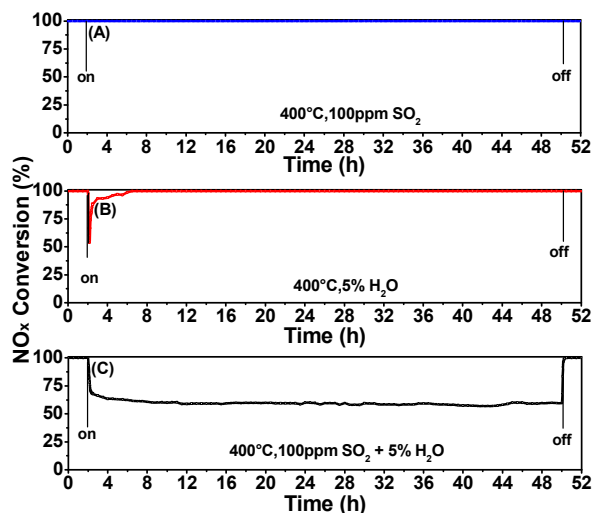


Figure S7. The effect of SO₂ (A), H₂O (B) and SO₂ + H₂O (C) on the SCR activity over CeMo_{0.5}Zr₂O_x catalyst at 400 °C. Reaction conditions: [NO] = [NH₃] = 500 ppm, [O₂] = 5 vol.%, [SO₂] = 100 ppm, [H₂O] = 5 vol.%, GHSV = 50,000 h⁻¹.

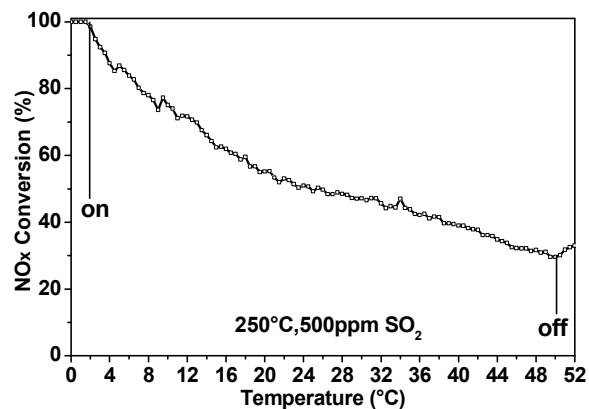


Figure S8. The effect of 500 ppm SO_2 on the SCR activity over $\text{CeMo}_{0.5}\text{Zr}_2\text{O}_x$ catalyst at 250 °C. Reaction conditions: $[\text{NO}] = [\text{NH}_3] = 500 \text{ ppm}$, $[\text{O}_2] = 5 \text{ vol.}\%$, $[\text{SO}_2] = 500 \text{ ppm}$, $[\text{H}_2\text{O}] = 5 \text{ vol.}\%$, GHSV = $50,000 \text{ h}^{-1}$.

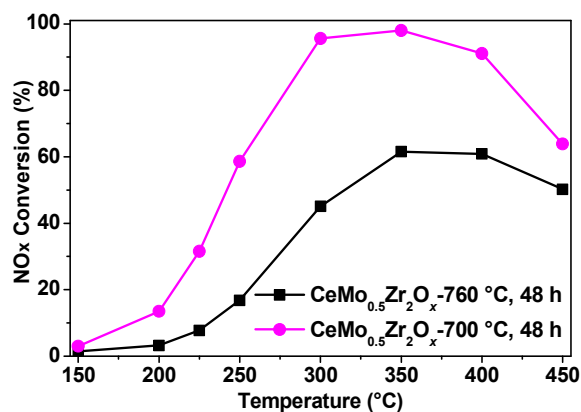


Figure S9. NO_x conversion in NH_3 -SCR reaction as a function of temperature over $\text{CeMo}_{0.5}\text{Zr}_2\text{O}_x$ catalysts hydrothermal aged at 700 or 760 °C for 48 h. Reaction conditions: $[\text{NO}] = [\text{NH}_3] = 500 \text{ ppm}$, $[\text{O}_2] = 5 \text{ vol.}\%$, GHSV = $50,000 \text{ h}^{-1}$.

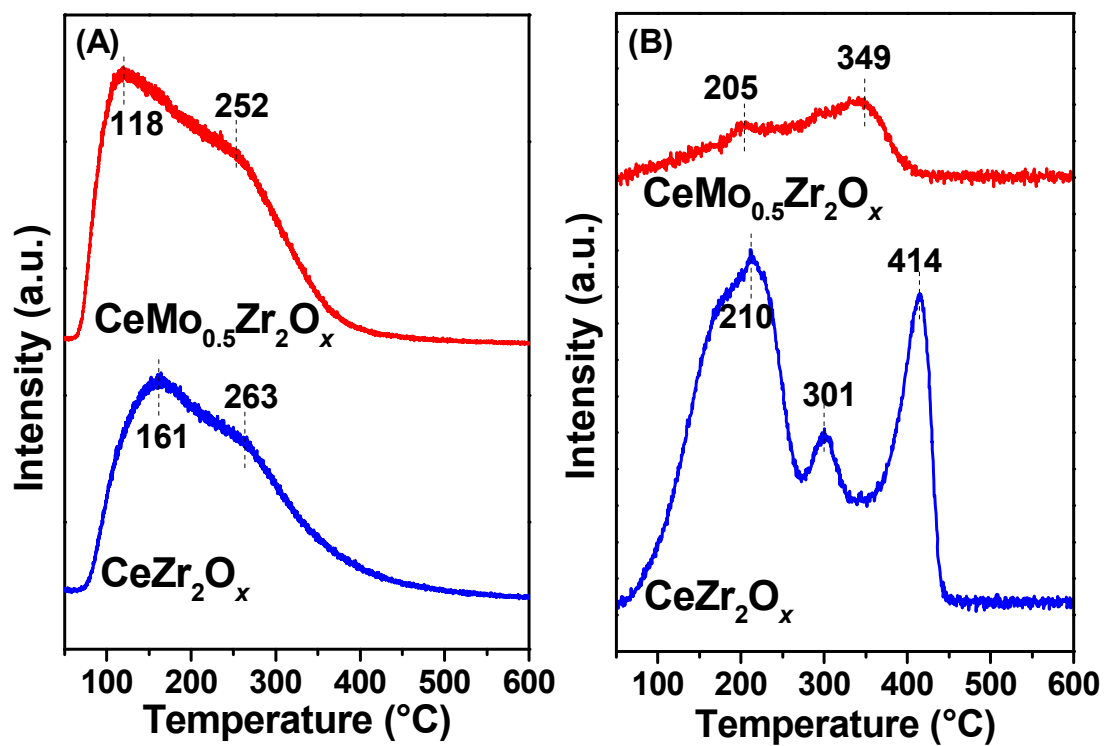


Figure S10. NH_3 -TPD (A) and NO -TPD (B) results over CeZr_2O_x and $\text{CeMo}_{0.5}\text{Zr}_2\text{O}_x$

catalysts.