

Supporting Information

Oxygen Storage Capacity and Thermal Stability of CuMnO₂-CeO₂ Composite System

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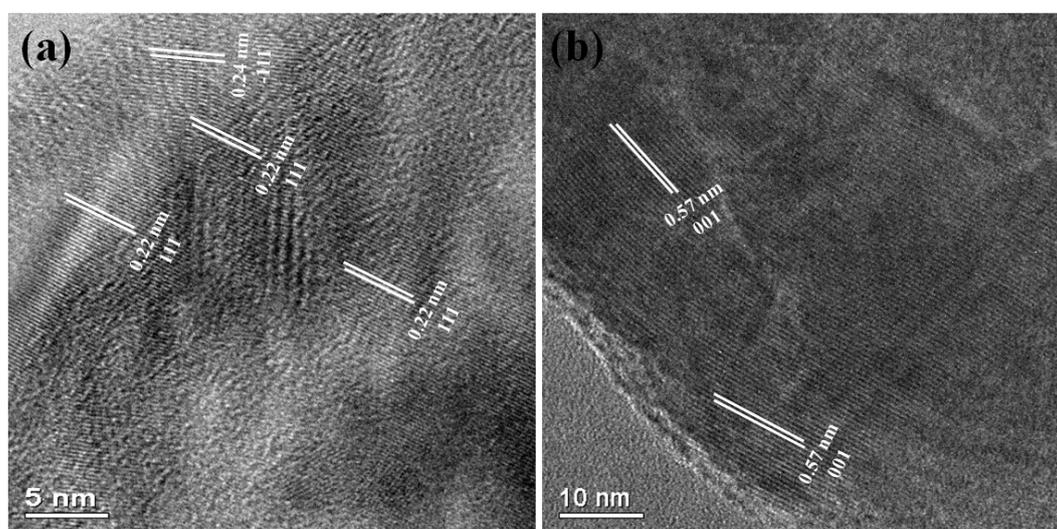


Figure S1. HRTEM images of (a) CuMnO₂-10CeO₂ and (b) CuMnO₂-40CeO₂.

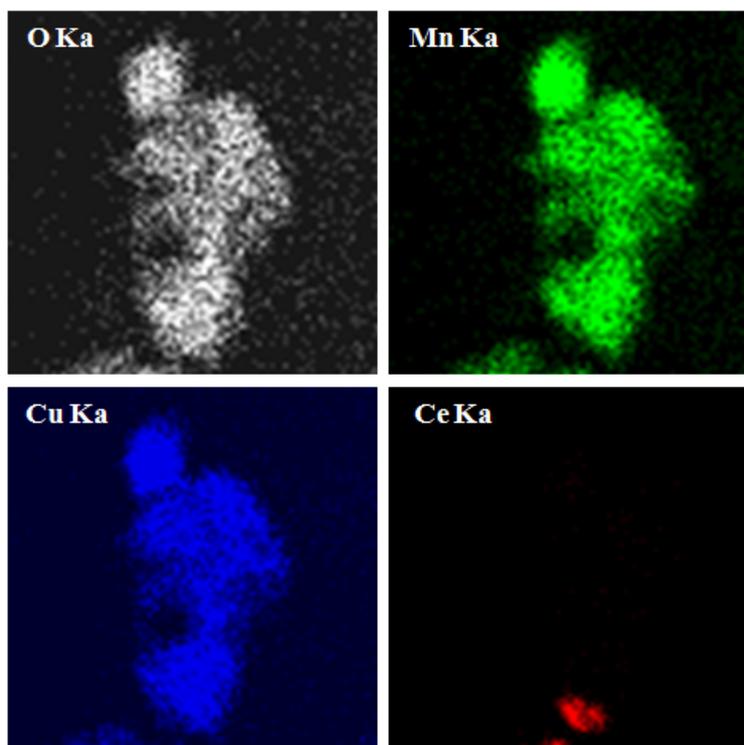


Figure S2. TEM elemental mapping for CuMnO₂-10CeO₂.

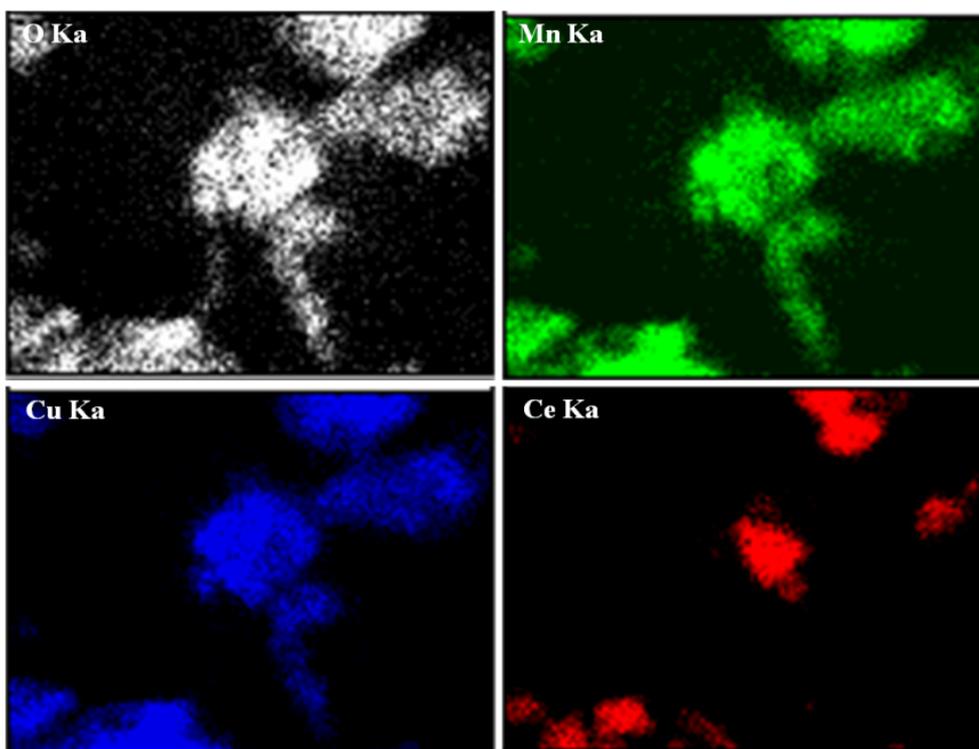


Figure S3. TEM elemental mapping for $\text{CuMnO}_2\text{-40CeO}_2$.

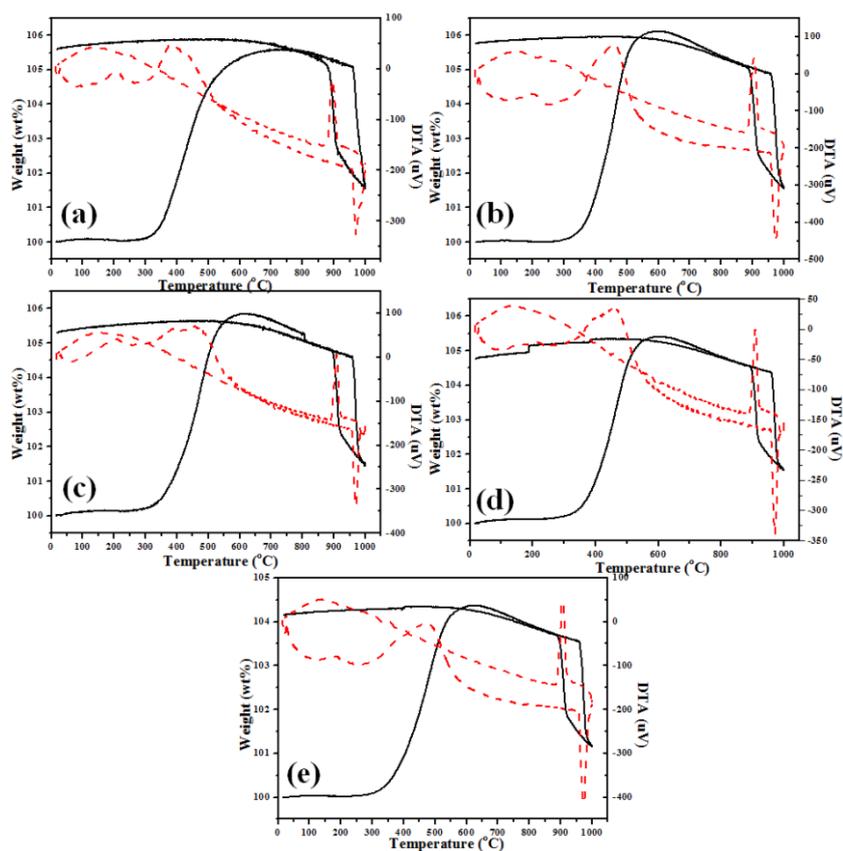


Figure S4. TGA and DTA curves of $\text{CuMnO}_2\text{-xCeO}_2$ at within room temperature to 1000 °C: (a) CuMnO_2 , (b) $\text{CuMnO}_2\text{-5CeO}_2$, (c) $\text{CuMnO}_2\text{-10CeO}_2$, (d) $\text{CuMnO}_2\text{-20CeO}_2$, (e) $\text{CuMnO}_2\text{-40CeO}_2$.

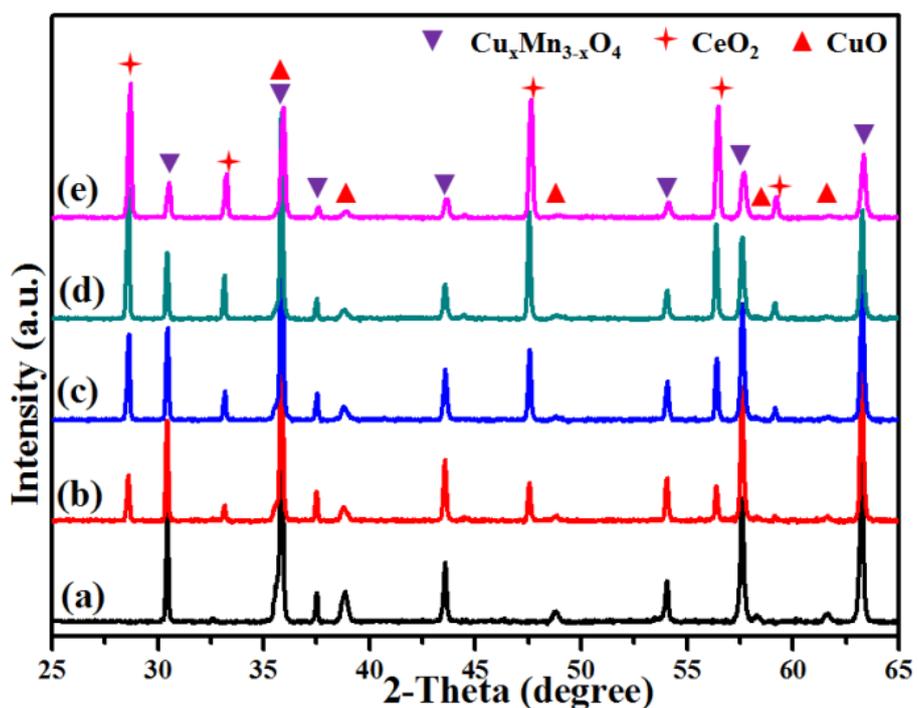


Figure S5. XRD patterns of oxidized $\text{CuMnO}_2\text{-xCeO}_2$ after treated under static air at $1000\text{ }^\circ\text{C}$ for 10 min: (a) CuMnO_2 , (b) $\text{CuMnO}_2\text{-5CeO}_2$, (c) $\text{CuMnO}_2\text{-10CeO}_2$, (d) $\text{CuMnO}_2\text{-20CeO}_2$, (e) $\text{CuMnO}_2\text{-40CeO}_2$.

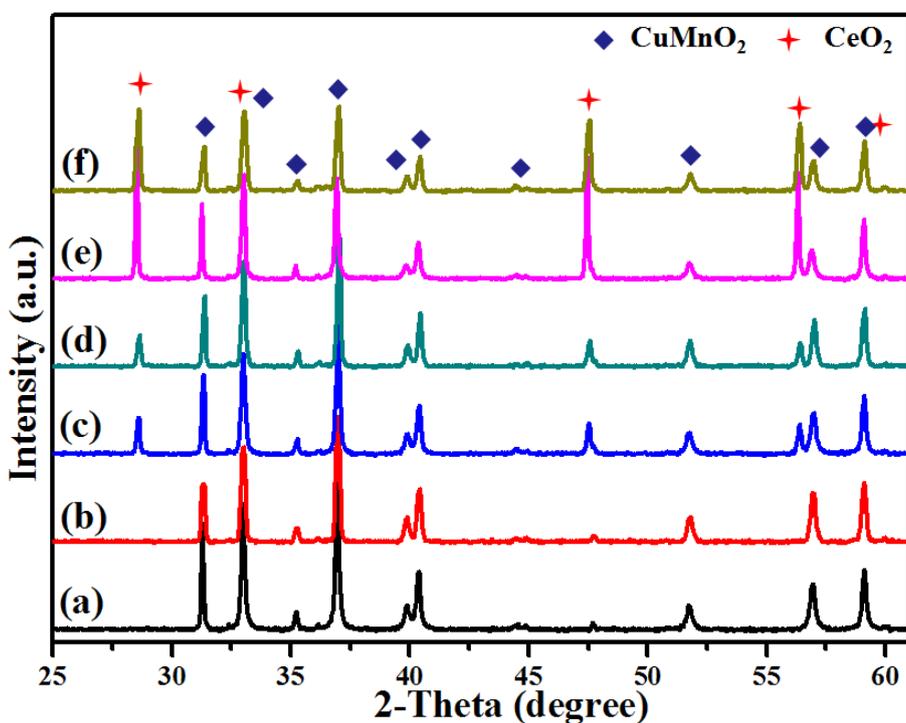


Figure S6. XRD patterns of as-prepared $\text{CuMnO}_2\text{-xCeO}_2$ (a, c and e) and treating the oxidized samples at $900\text{ }^\circ\text{C}$ for 2 h under flowing argon (b, d, f): (a, b) CuMnO_2 , (c, d) $\text{CuMnO}_2\text{-5CeO}_2$, (e, f) $\text{CuMnO}_2\text{-20CeO}_2$.

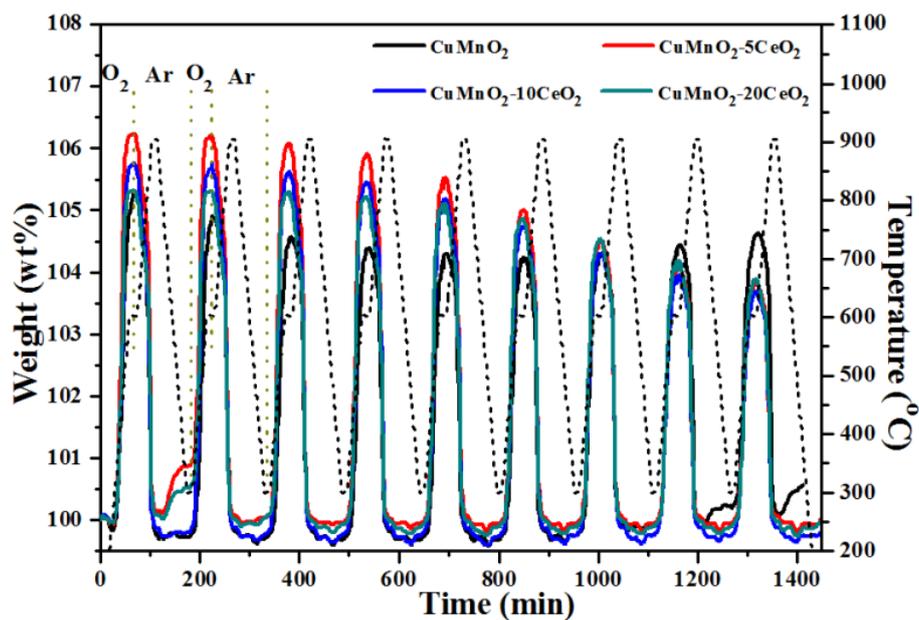


Figure S7. TGA curves of $\text{CuMnO}_2\text{-}x\text{CeO}_2$ composites under alternating O_2 and argon for nine cycles between 300 and 900 °C.

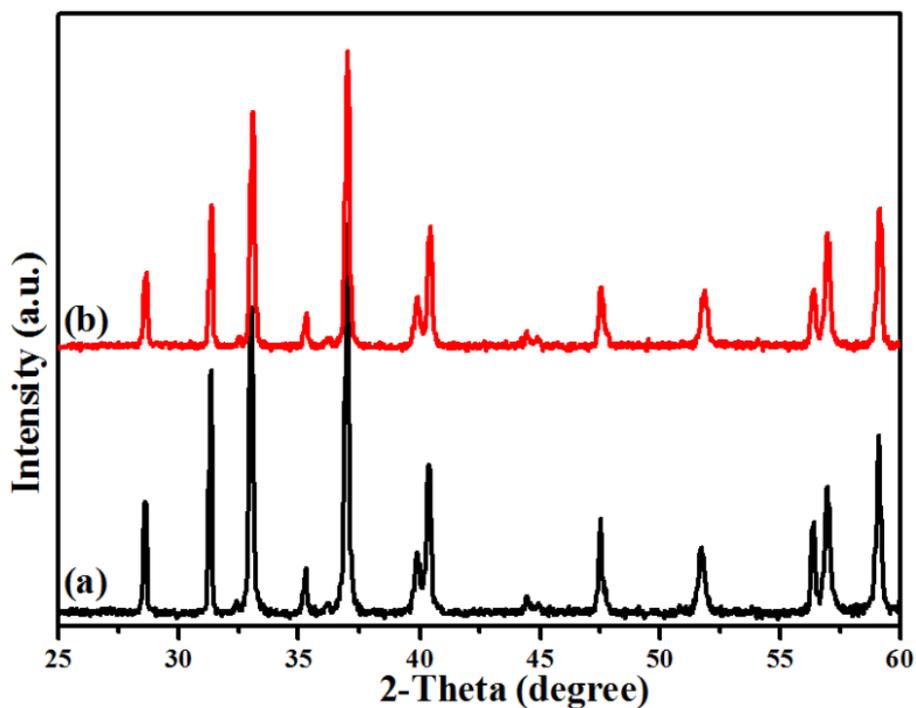


Figure S8. XRD patterns of $\text{CuMnO}_2\text{-}5\text{CeO}_2$: (a) post-annealing at 960 °C for 12 h under flowing argon, (b) alternating O_2 and Ar between 300 and 900 °C for 9 cycles.

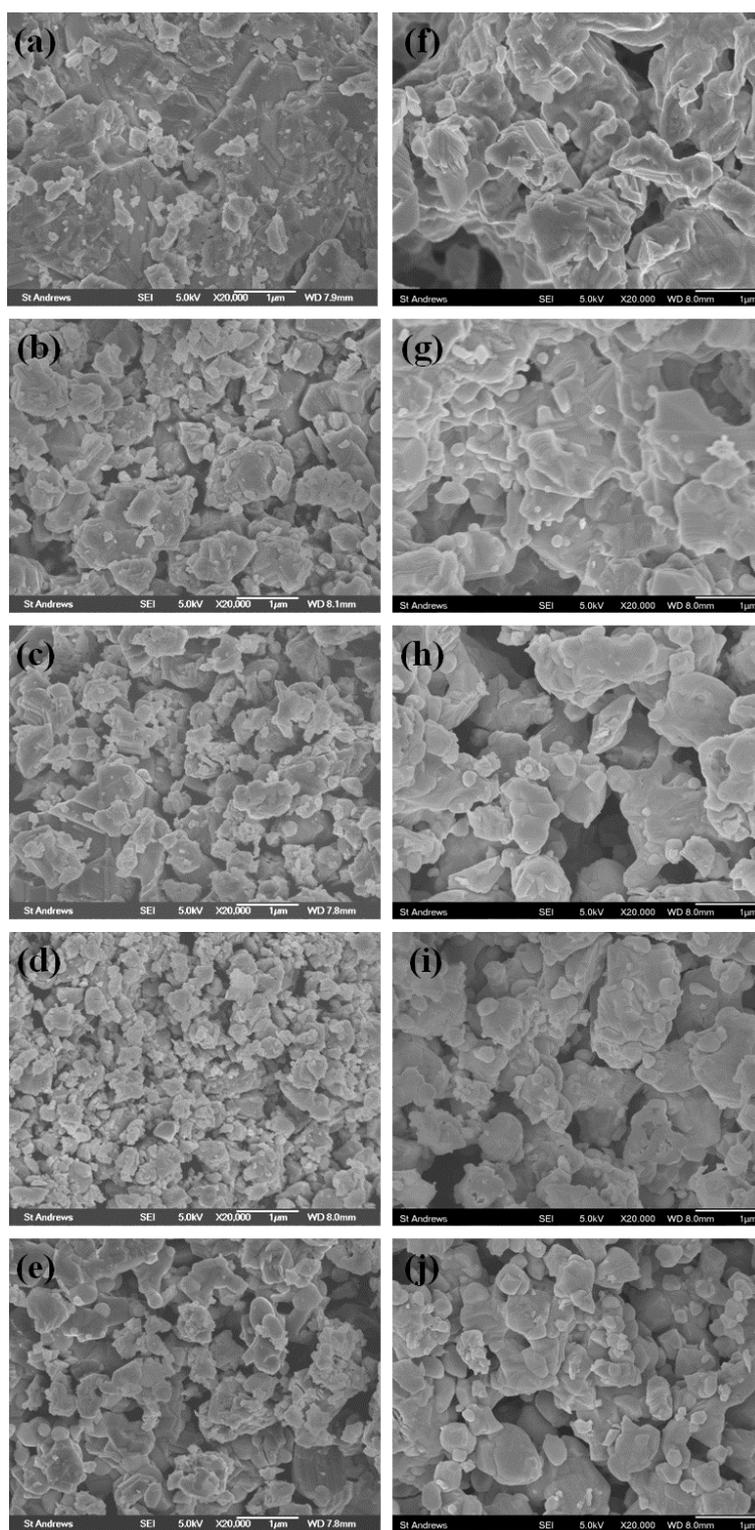


Figure S9. FESEM images for as-prepared $\text{CuMnO}_2\text{-xCeO}_2$ (a-e) and after TGA treated under alternating O_2 and Ar between 300 and 900 °C for nine cycles (f-j): CuMnO_2 (a, f), $\text{CuMnO}_2\text{-5CeO}_2$ (b, g), $\text{CuMnO}_2\text{-10CeO}_2$ (c, h), $\text{CuMnO}_2\text{-20CeO}_2$ (d, i) and $\text{CuMnO}_2\text{-40CeO}_2$ (e, j).

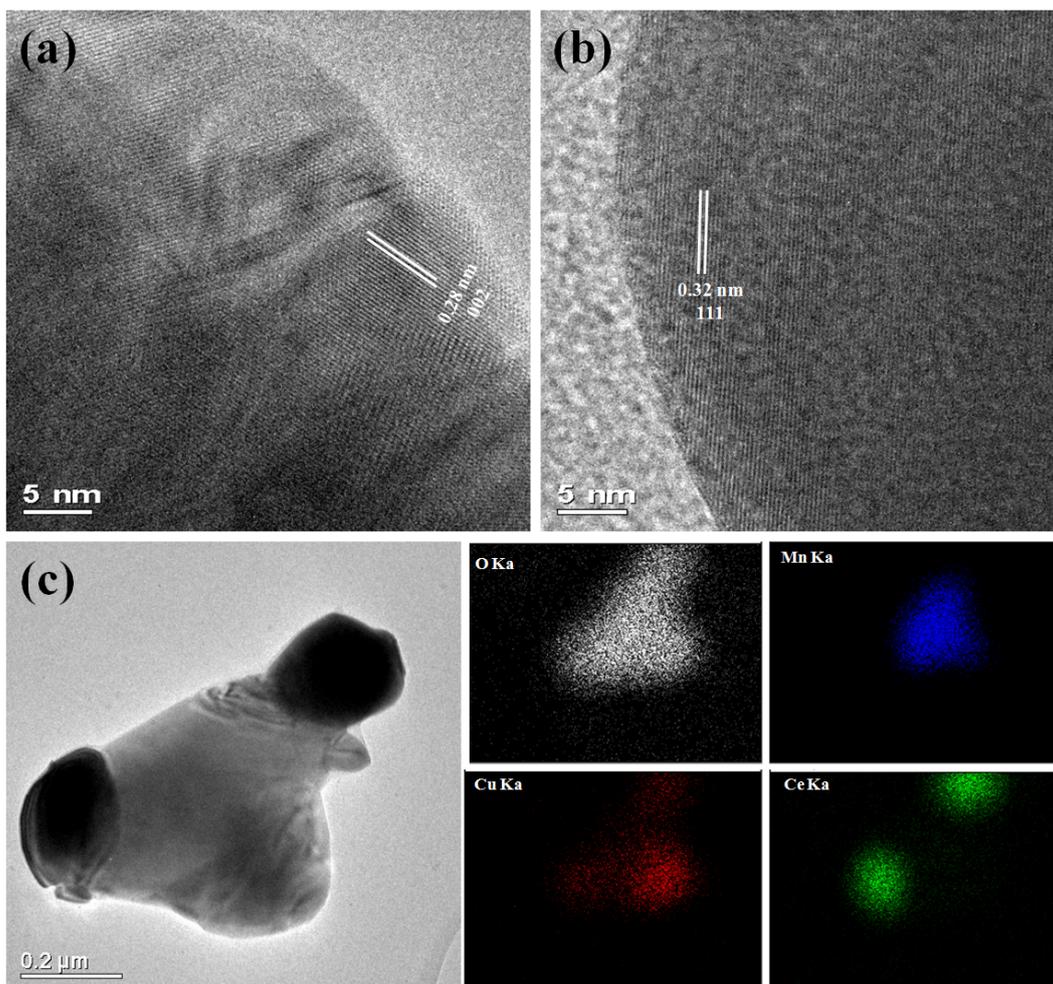


Figure S10. HRTEM images of CuMnO_2 - 10CeO_2 after TGA test under alternating O_2 and argon for nine cycles between 300 and 900 $^\circ\text{C}$: (a) CuMnO_2 , (b) CeO_2 . TEM images of CuMnO_2 - 10CeO_2 (c) and its TEM elemental mappings.