

Supporting Information

Synthesis of $\text{CeO}_2/\text{Co}_3\text{O}_4$ catalyst with a remarkable performance for soot oxidation reaction

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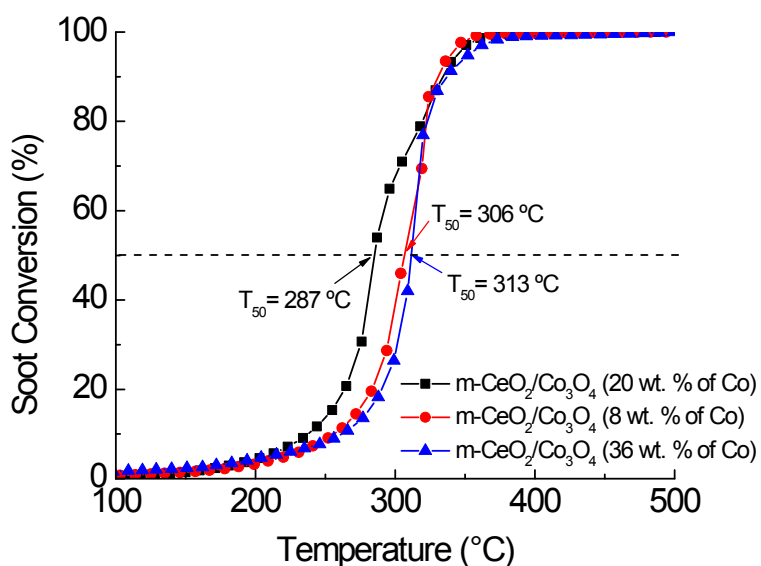


Fig. S1. Soot conversion (%) versus temperature (°C) for m-CeO₂/Co₃O₄ (8 wt. % of Co), m-CeO₂/Co₃O₄ (20 wt. % of Co), and m-CeO₂/Co₃O₄ (36 wt. % of Co) in tight contact.

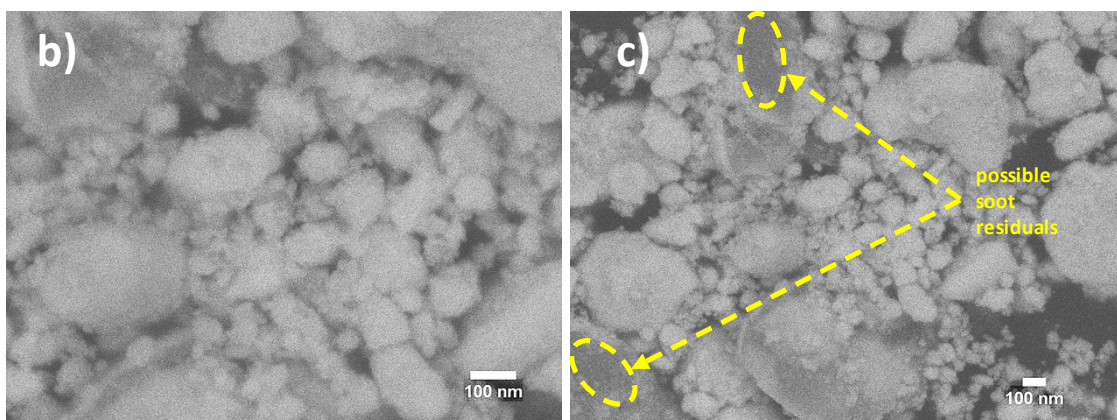
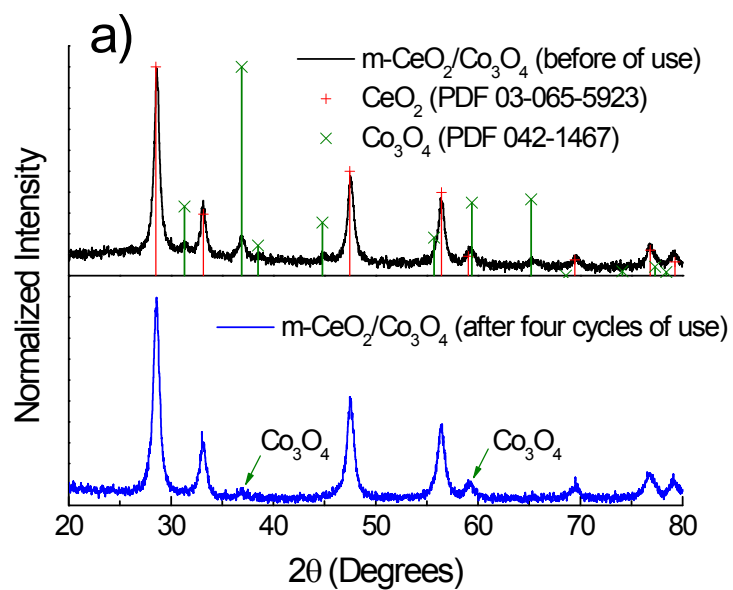


Fig. S2. a) X-ray diffraction patterns of m-CeO₂/Co₃O₄ before and after use in soot oxidation reaction, b) and c) Secondary electron images of m-CeO₂/Co₃O₄ after four cycles of use in soot oxidation reaction.

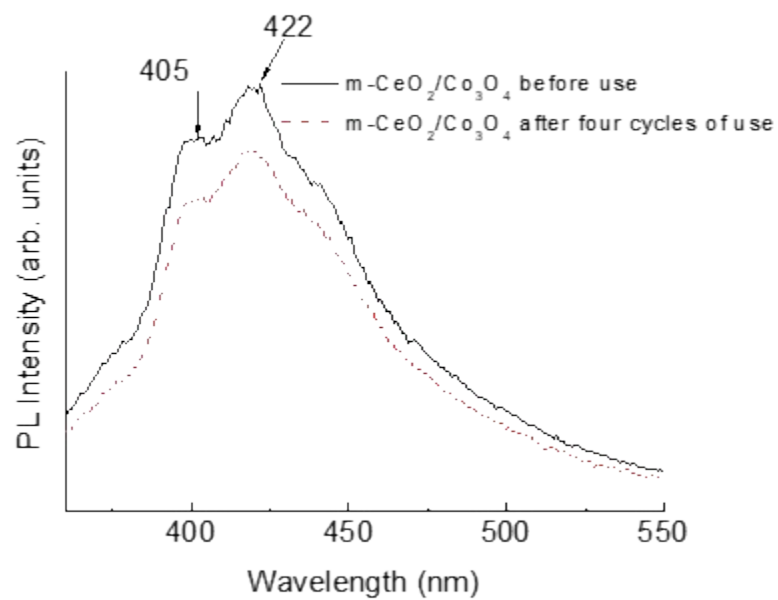


Fig. S3. Photoluminescence (PL) spectra of m-CeO₂/Co₃O₄ before and after use.

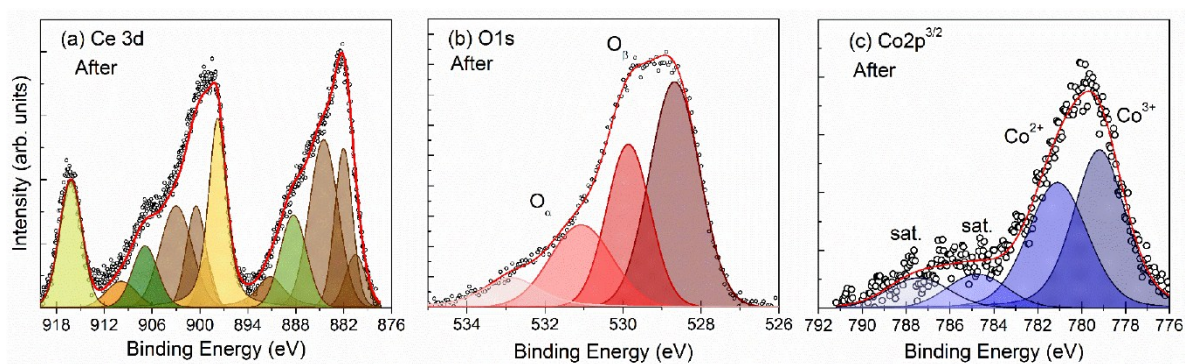


Fig. S4. XPS of m-CeO₂/Co₃O₄ for a) Ce 3d, b) O 1s and c) Co 2p_{3/2} after four cycles of use.

Table S1. Position of each peak for deconvolute ion of Ce3d.

Ce3d	BE(eV)		BE(eV)		
	Ce 3d ^{5/2}		Ce3d ^{3/2}		
Ce ³⁺	880.5	u ₀	899.3	v ₀	sat
	884.5	u ₁	903.1	v ₁	
Ce ⁴⁺	882.0	u	900.5	u	sat
	888.3	u ₂	906.9	v ₂	sat
	891.2	u ₄	909.9	v ₄	damage
	897.8	u ₃	916.3	v ₃	

Table S2. Ratios of cerium and cobalt ions present on m-CeO₂/Co₃O₄ before and after four cycles of use.

m-CeO ₂ /Co ₃ O ₄	Before	After
Ce ³⁺ / Ce ⁴⁺	0.9	0.7
Co ³⁺ / Co ²⁺	1.3	1.2