Supporting Information

Understanding the catalytic property for synthesizing NO_x derivative NH_3 by an alternate gas-switching process†

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Table S1. Assignment of peaks due to the resultant cubic CeO_2-ZrO_2 solid solution

	d-spacing (nm) / 2theta (°, Cu Kα)		
	CeO_2 (reference)	Pt@m$Ce_{0.8}Zr_{0.2}O_2$	Ba/Pt@m$Ce_{0.8}Zr_{0.2}O_2$
(111)	0.3132 / 28.5	0.3100 / 28.8	0.3100 / 28.8
(200)	0.2714 / 33.0	0.2691 / 33.3	0.2691 / 33.3
(220)	0.1914 / 47.5	0.1892 / 48.1	0.1899 / 47.9
(311)	0.1634 / 56.3	0.1613 / 57.1	0.1618 / 56.9
(222)	0.1563 / 59.1	0.1551 / 59.6	0.1551 / 59.6
(400)	0.1352 / 69.5	0.1342/ 70.1	0.1342 / 70.1
(331)	0.1242 / 76.7	0.1229 / 77.7	0.1229 / 77.7

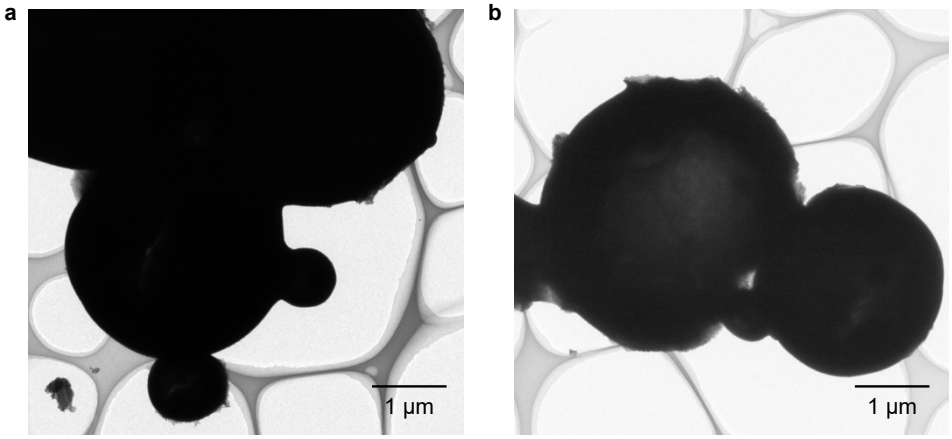

Fig. S1 Representative bright-field TEM images of (a) Pt@m$Ce_{0.8}Zr_{0.2}O_2$ and (b) BaO/Pt@m$Ce_{0.8}Zr_{0.2}O_2$.

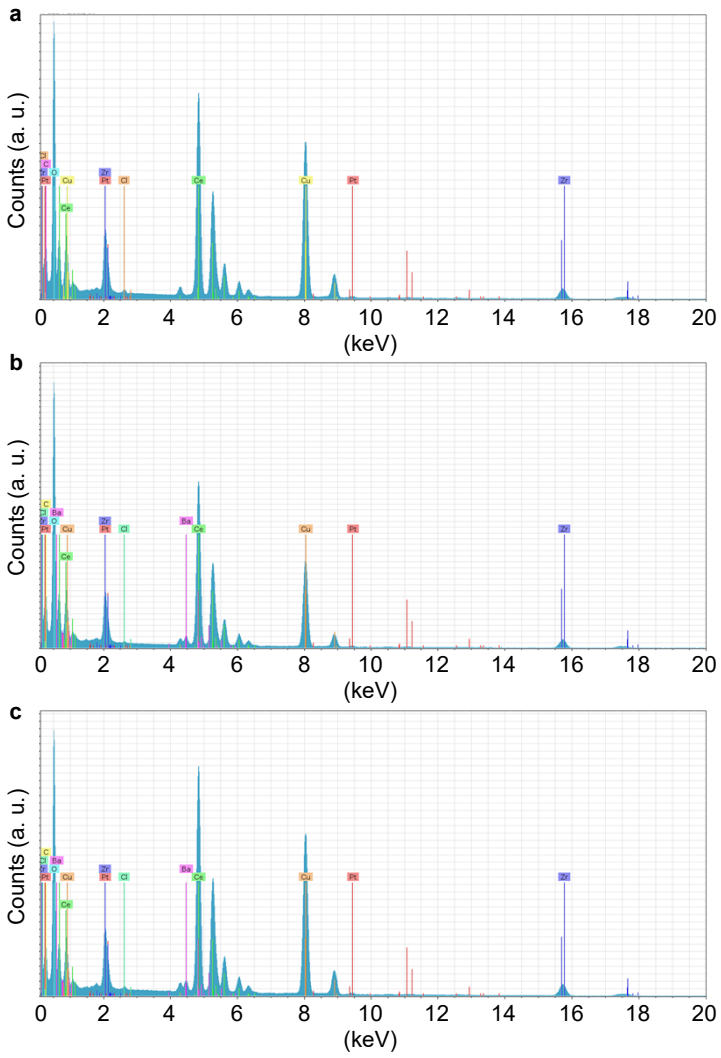

Fig. S2 EDS spectra of (a) fresh Pt@m$Ce_{0.8}Zr_{0.2}O_2$, (b) fresh BaO/Pt@m$Ce_{0.8}Zr_{0.2}O_2$ and (c) BaO/Pt@m$Ce_{0.8}Zr_{0.2}O_2$ after the catalytic reactions.

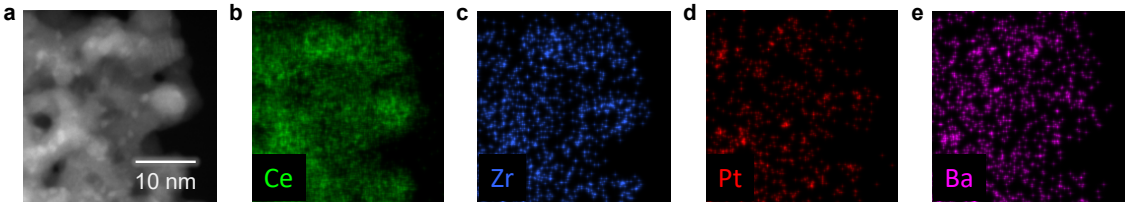

Fig. S3 (a) HAADF-STEM image with the EDS mappings of (b-e) Ce, Zr, Pt and Ba of BaO/Pt@m$Ce_{0.8}Zr_{0.2}O_2$ after the 15 cycles of the gas-switching NTA process.