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Supporting Information

Crystal plane dependent dopant migration that boosts catalytic oxidation

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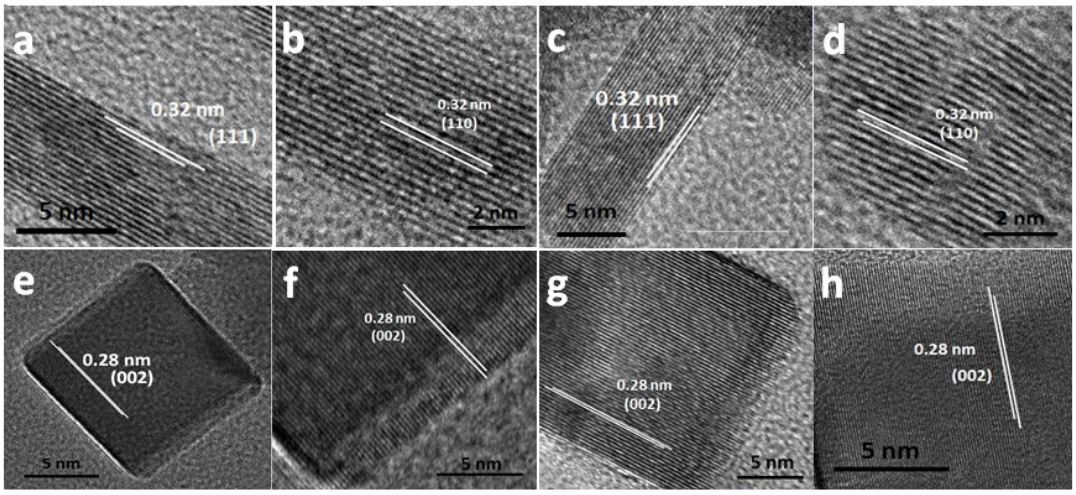

Figure S1. HRTEM images of $Fe_xCe_{1-x}O_{2-\delta}$ samples: (a, b) Rod-N (nanorods under N_2 pretreatment); (c, d) Rod-O (nanorods under O_2 pretreatment); (e, f) Cube-N (nanocubes under N_2 pretreatment); (g, h) Cube-O (nanocubes under O_2 pretreatment).

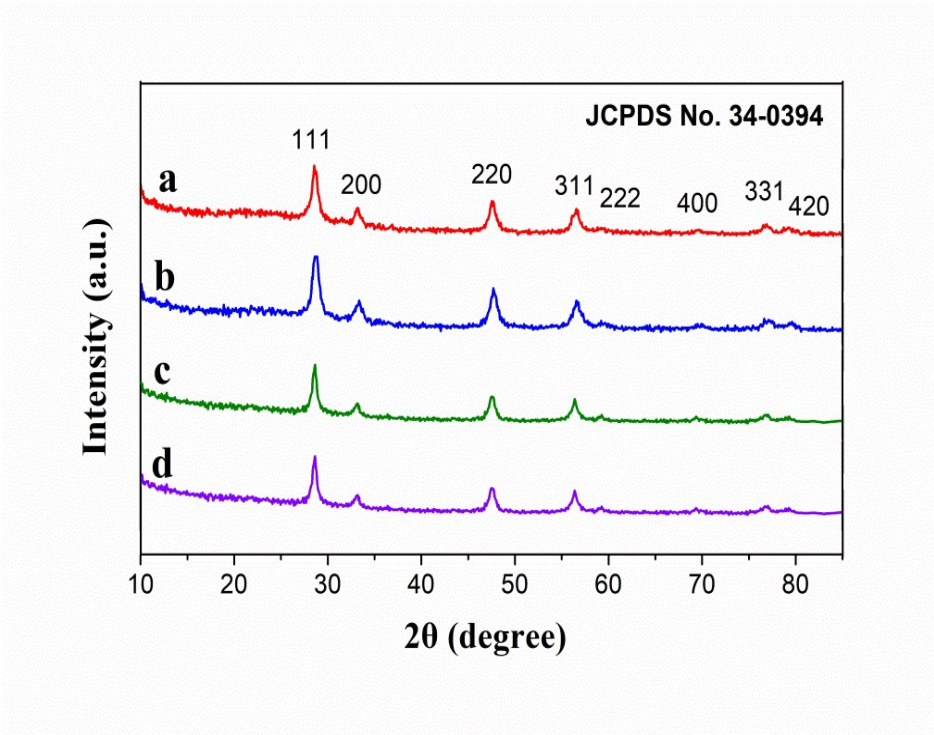

Figure S2. XRD patterns of $Fe_xCe_{1-x}O_{2-\delta}$ samples: (a) Rod-N (nanorods under N_2 pretreatment); (b) Rod-O (nanorods under O_2 pretreatment); (c) Cube-N (nanocubes under N_2 pretreatment); (d) Cube-O (nanocubes under O_2 pretreatment).

Table S1. Analysis of XRD results of samples: Rod-N (nanorods under N_2 pretreatment); Rod-O (nanorods under O_2 pretreatment); Cube-N (nanocubes under N_2 pretreatment); Cube-O (nanocubes under O_2 pretreatment).

Catalysts	Rod-N	Rod-O	Cube-N	Cube-O
$I_{(220)}$ / $I_{(111)}$	0.545	0.552	0.503	0.511
$I_{(200)}$ / $I_{(111)}$	0.421	0.415	0.443	0.457

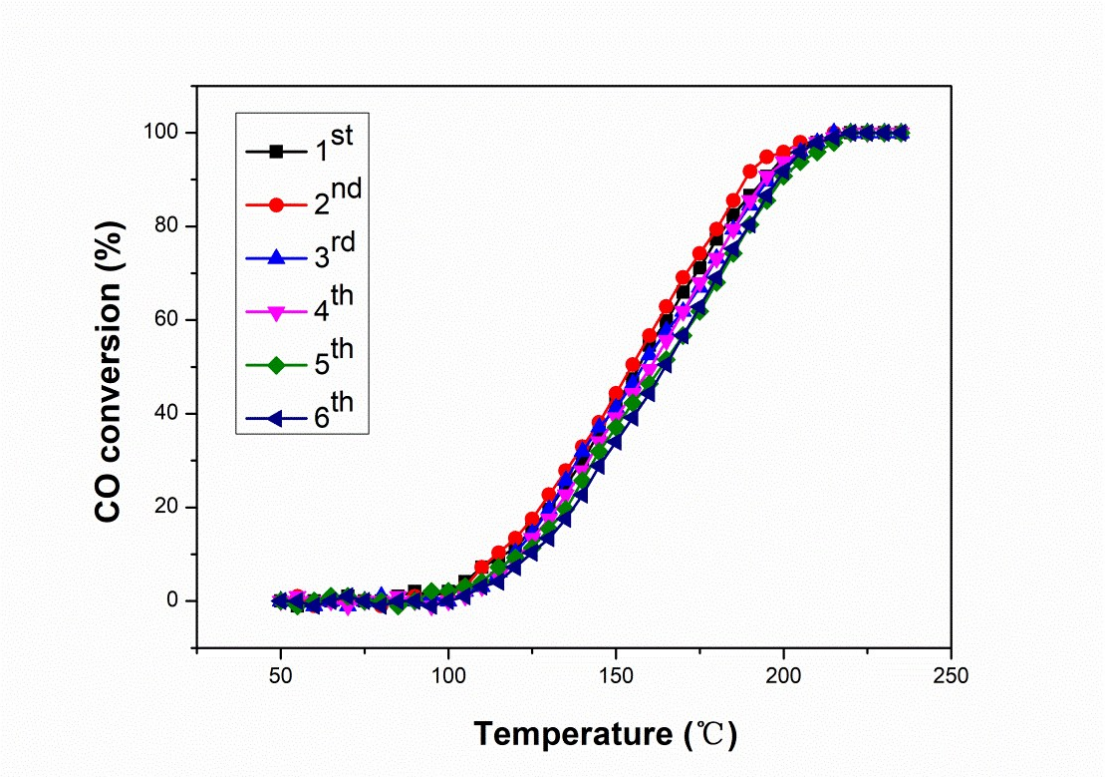

Figure S3. Catalytic stability of the CO oxidation over Cube-O (nanocubes under O_2 pretreatment).

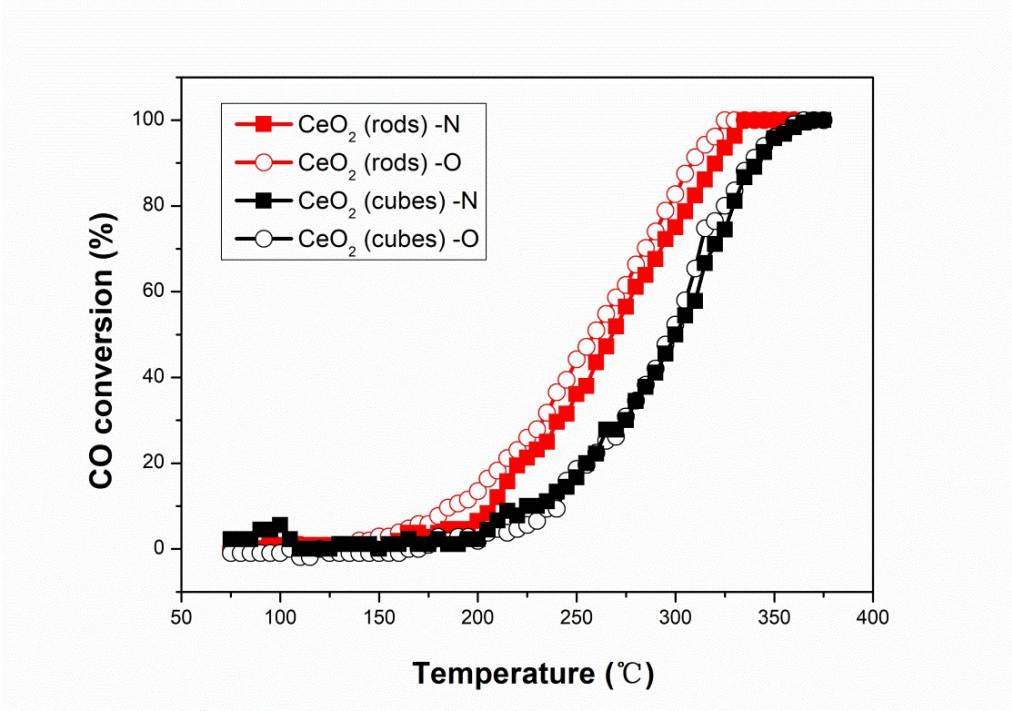

Figure S4. Catalytic activities of the CO + O_2 reaction over CeO_2 nanorods activated in N_2 atmosphere; CeO_2 nanorods activated in O_2 atmosphere; CeO_2 nanocubes activated in N_2 atmosphere; CeO_2 nanocubes activated in O_2 atmosphere.

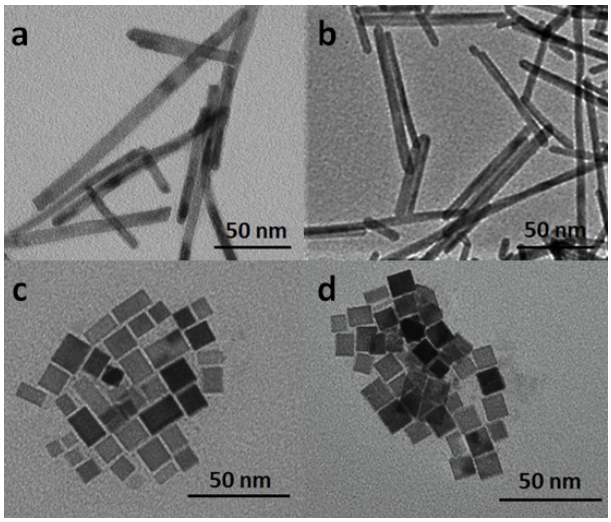

Figure S5. TEM images of used $Fe_xCe_{1-x}O_{2-\delta}$ samples: (a) Rod-N (nanorods under N_2 pretreatment); (b) Rod-O (nanorods under O_2 pretreatment); (c) Cube-N (nanocubes under N_2 pretreatment); (d) Cube-O (nanocubes under O_2 pretreatment).

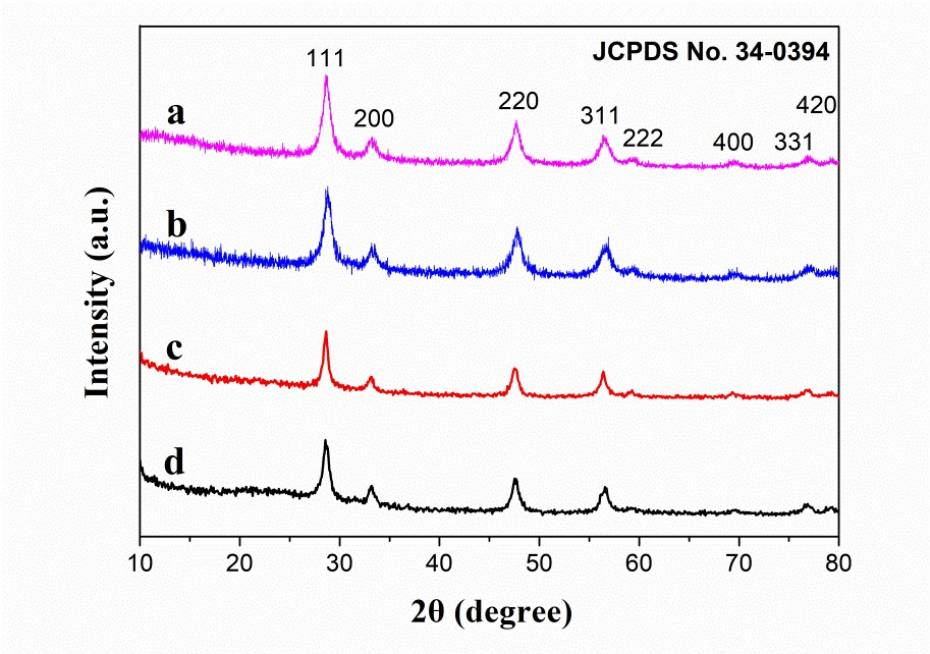

Figure S6. XRD patterns of used $Fe_xCe_{1-x}O_{2-\delta}$ samples: (a) Rod-N (nanorods under N_2 pretreatment); (b) Rod-O (nanorods under O_2 pretreatment); (c) Cube-N (nanocubes under N_2 pretreatment); (d) Cube-O (nanocubes under O_2 pretreatment).

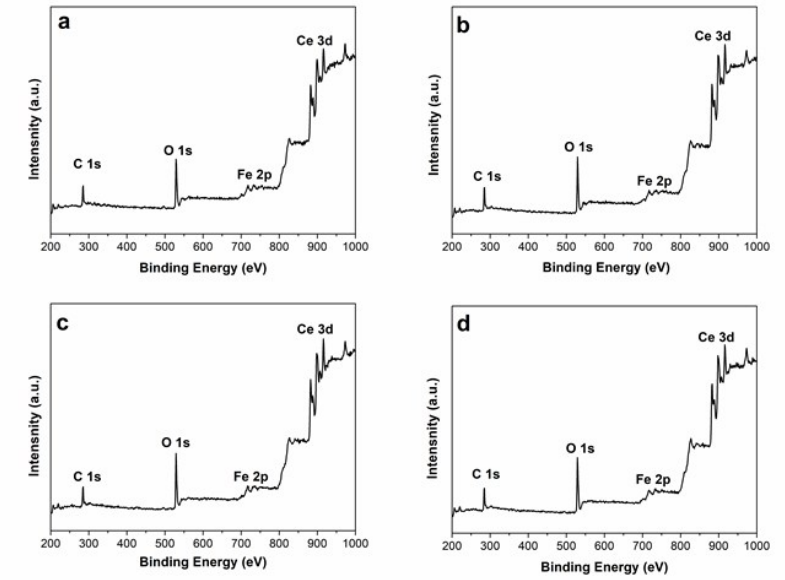

Figure S7. XPS survey spectrum of $Fe_xCe_{1-x}O_{2-\delta}$ samples: (a) Rod-N (nanorods under N_2 pretreatment); (b) Rod-O (nanorods under O_2 pretreatment); (c) Cube-N (nanocubes under N_2 pretreatment); (d) Cube-O (nanocubes under O_2 pretreatment).