

Electronic supplementary Information (ESI)

Supporting Table

Table S1. EXAFS parameters obtained from the analysis of Ce K- and Sn K-edge spectra $\text{Ce}_{1-x}\text{Sn}_x\text{O}_2$.

Ce K-edge	Bond	C.N.	Bond length (Å)	$\sigma^2(\text{Å}^2)$
$\text{Ce}_{0.8}\text{Sn}_{0.2}\text{O}_2$	Ce-O	8	2.311(5)	0.010(1)
$\text{Ce}_{0.7}\text{Sn}_{0.3}\text{O}_2$	Ce-O x 6	6.4(5)	2.321(6)	0.011(1)
	Ce-O x 2	1.6(5)	2.54(2)	0.005(2)
$\text{Ce}_{0.65}\text{Sn}_{0.35}\text{O}_2$	Ce-O	5.9(5)	2.321(7)	0.012(1)
	Ce-O	2.1(5)	2.56(2)	0.005(2)
$\text{Ce}_{0.6}\text{Sn}_{0.4}\text{O}_2$	Ce-O	3.7(3)	2.29(1)	0.011(2)
	Ce-O	4.3(3)	2.45(3)	0.017(3)
$\text{Ce}_{0.55}\text{Sn}_{0.45}\text{O}_2$	Ce-O	3.7(3)	2.29(1)	0.011(3)
	Ce-O	4.3(3)	2.49(4)	0.017(3)
$\text{Ce}_{0.5}\text{Sn}_{0.5}\text{O}_2$	Ce-O	3.7(3)	2.26(1)	0.015(4)
	Ce-O	4.3(3)	2.50(4)	0.015(3)
Sn K-edge				
$\text{Ce}_{0.8}\text{Sn}_{0.2}\text{O}_2$	Sn-O	8	2.051(2)	0.006(1)
$\text{Ce}_{0.7}\text{Sn}_{0.3}\text{O}_2$	Sn-O	8	2.053(6)	0.005(1)
$\text{Ce}_{0.65}\text{Sn}_{0.35}\text{O}_2$	Sn-O	8	2.051(3)	0.006(1)
$\text{Ce}_{0.6}\text{Sn}_{0.4}\text{O}_2$	Sn-O	8	2.054(2)	0.005(1)
$\text{Ce}_{0.55}\text{Sn}_{0.45}\text{O}_2$	Sn-O	8	2.051(2)	0.005(1)
$\text{Ce}_{0.5}\text{Sn}_{0.5}\text{O}_2$	Sn-O	8	2.052(2)	0.005(1)

Supporting Figures

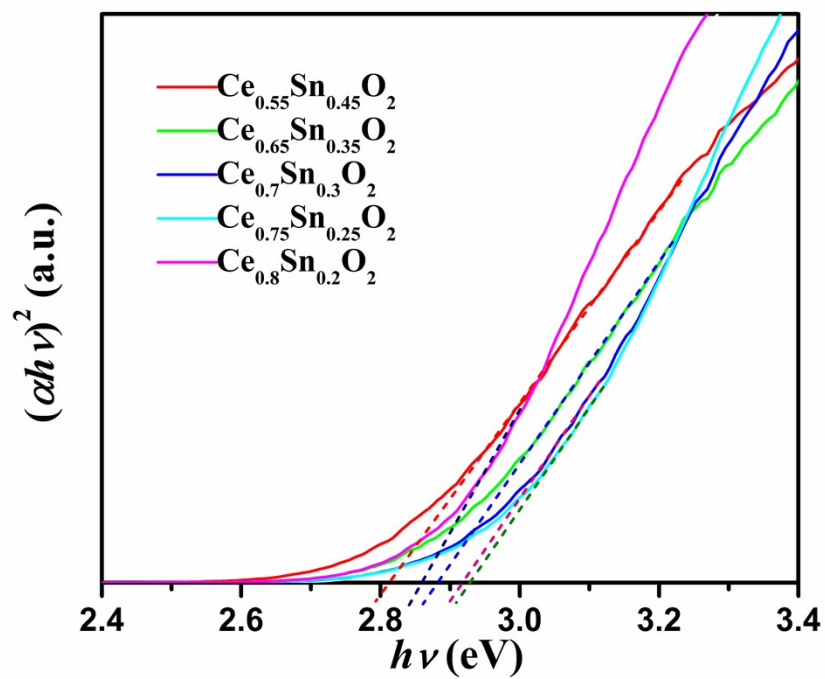


Figure S1. Band gaps of the $\text{Ce}_{1-x}\text{Sn}_x\text{O}_2$ solid solutions at different Sn concentrations

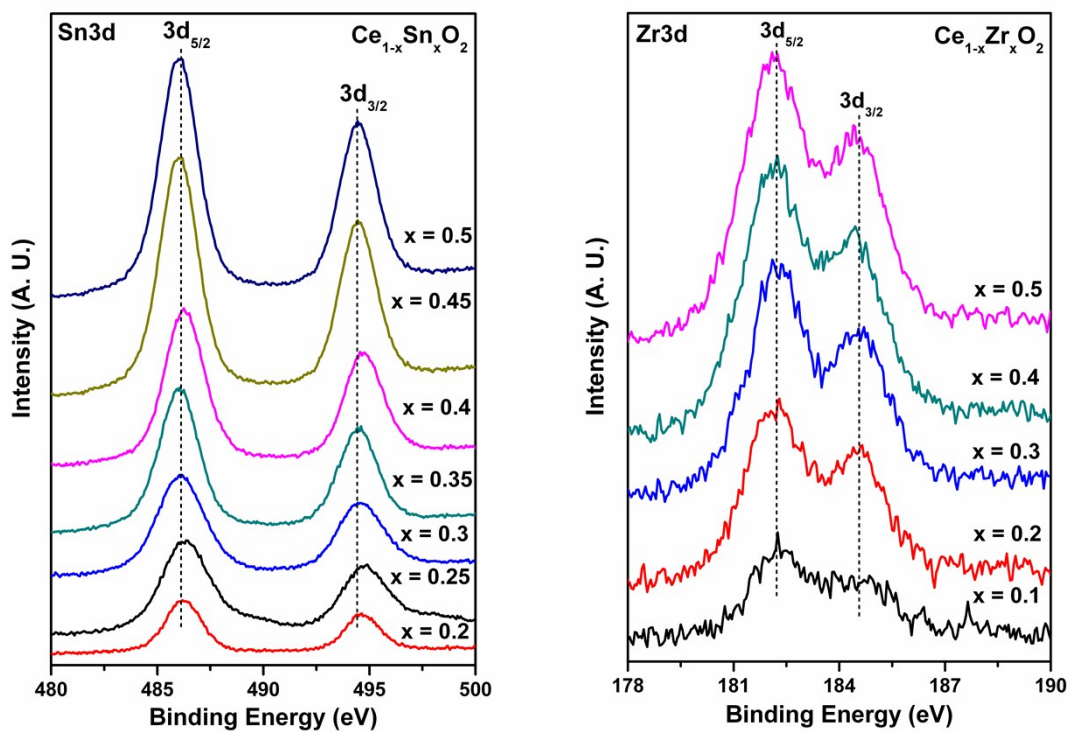


Fig. S2. XPS of Sn3d and Zr3d core levels in $Ce_{1-x}M_xO_2$ (M = Sn and Zr) solid solutions.



Figure S3. Visible color change in $\text{Ce}_{1-x}\text{Sn}_x\text{O}_2$ with increasing Sn substitutions.