

# Reaction Kinetics and Mechanism of VOCs Combustion on Mn-Ce-SBA-15

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**Table S1.** Binding energies and FWHM of corresponding’s curve-fitting peaks based on standard spectra of Ce<sup>3+</sup> and Ce<sup>4+</sup>.

Ce/SBA 15										
Ox. state	4+	4+	4+ Sat.	4+	4+	4+ Sat.	3+	3+	3+	3+
name	Ce3d <sub>5/2</sub> V	Ce3d <sub>5/2</sub> VII	Ce3d <sub>5/2</sub> VIII	Ce3d <sub>3/2</sub> U	Ce3d <sub>3/2</sub> UII	Ce3d <sub>3/2</sub> UIII	Ce3d <sub>5/2</sub> V0	Ce3d <sub>5/2</sub> VI	Ce3d <sub>3/2</sub> U0	Ce3d <sub>3/2</sub> UI
BE, eV	882.22	888.62	898.01	900.62	907.02	917.14	881.5	885.2	900.1	903.8
FWHM, eV	3.47	2.67	3.5	3.31	2.1	2.86	2.99	3.49	2.88	3.45
MnCe (1:0.5)										
BE, eV	882.48	888.88	898.01	900.88	907.28	916.61	881	884.7	899.6	903.3
FWHM, eV	2.21	3.78	3.04	3.4	2.53	2.7	2.99	3.5	3.49	3.49
MnCe (1:2)										
BE, eV	882.14	888.54	898.01	900.87	907.14	917.35	881.29	884.99	899.89	903.59
FWHM, eV	2.67	2.57	3.49	3.79	2.51	2.82	3.49	3.79	3.8	3.8

**Table S2.** Binding energies, FWHM and splitting of corresponding's curve-fitting peaks of standard spectra of Ce<sup>3+</sup> and Ce<sup>4+</sup>.

Standard Ce <sup>4+</sup>						
Ox. state	4+	4+	4+ Sat.	4+	4+	4+ Sat.
name	Ce3d <sub>5/2</sub> V	Ce3d <sub>5/2</sub> VII	Ce3d <sub>5/2</sub> VIII	Ce3d <sub>3/2</sub> U	Ce3d <sub>3/2</sub> UII	Ce3d <sub>3/2</sub> UIII
BE, eV	882.68	889.08	898.38	901.08	907.48	916.78
FWHM, eV	2.76	4.2	2.29	2.52	4.47	2.17
Δ=V+, eV	V	6.4	15.7	18.4	24.8	34.1
Standard Ce <sup>3+</sup>						
Ox. State	3+	3+	3+	3+		
name	Ce3d <sub>5/2</sub> V0	Ce3d <sub>5/2</sub> VI	Ce3d <sub>3/2</sub> U0	Ce3d <sub>3/2</sub> UI		
BE, eV	881.02	884.72	899.62	903.32		
FWHM, eV	2.9	3.57	3.52	3.89		
Δ=V0+ , eV	V0	3.7	18.6	22.3		