

## Supporting Information

### Ambient Pressure XPS and IRRAS Investigation of Ethanol Steam Reforming on Ni-CeO<sub>2</sub>(111) Catalysts: An In Situ Study of C-C and O-H Bond Scission

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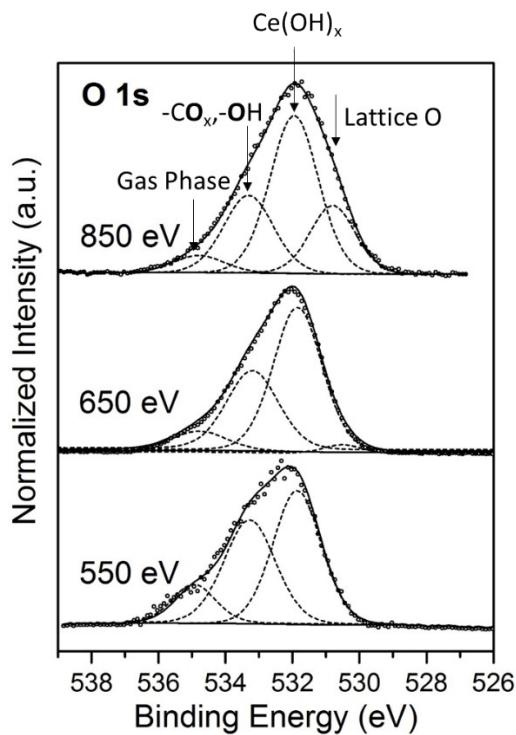


Figure S1. O 1s spectra after the ethanol steam reforming reaction on Ni-CeO<sub>2</sub>(111) surface with different incident photon energy as indicated.

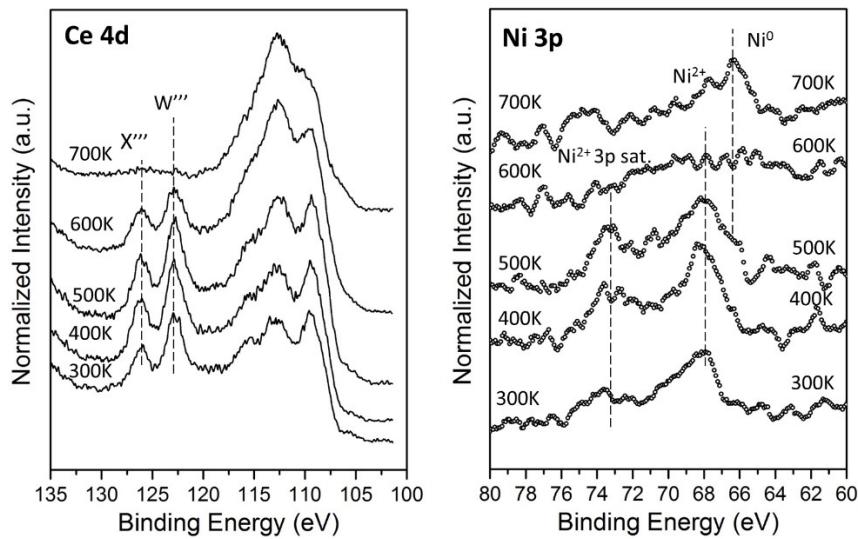


Figure S2. Ce 4d and Ni 3p spectra for the Ni-CeO<sub>2</sub>(111) surface under the reaction with 40 mTorr ethanol