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Fig. S1. XRD patterns of Co30Ce oxides, prepared by precipitation method using three different precipitating agents, after calcination at (a) 350 °C and (b) 650 °C.



Fig. S2. TEM images (a) of Co30Ce $_{urea}$ calcined at 650 °C and (b) of Co30Ce $_{NH4}$ calcined at 650 °C.



Fig. S3. Raman spectra of bare Co_3O_4 oxides prepared using three different precipitating agents, after calcination at 350 °C or at 650 °C.



Fig. S4. Raman spectra of Co30Ce oxides prepared using three different precipitating agents, after calcination at 350 °C or at 650 °C.



Fig. S5. Experimental and fitted Co2p photoelectron spectra for Co30Ce oxides precipitated by urea and $(NH_4)_2CO_3$ and calcined at 350 °C.