Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information for the manuscript

Controlled Synthesis of Carbon-supported Co Catalysts from Single-site to Nanoparticles: Characterization of the Structural Transformation and Investigation of their Oxidation Catalysis

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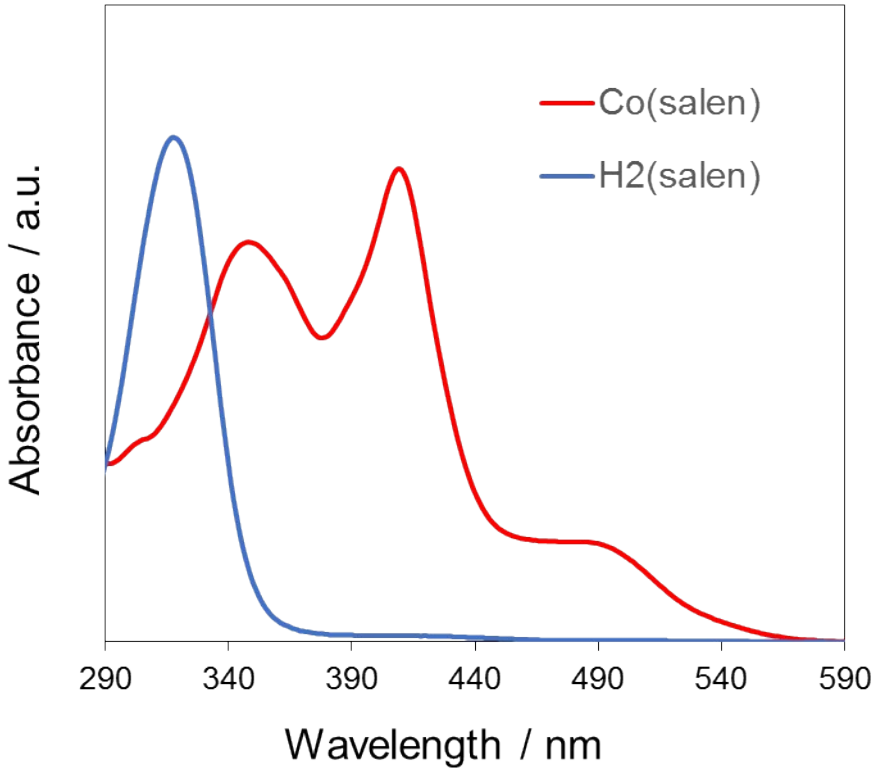

Fig. S1. (a) UV-vis spectra of H_2 salen ligand and Co(salen) complex in dichloromethane (0.1 mM).

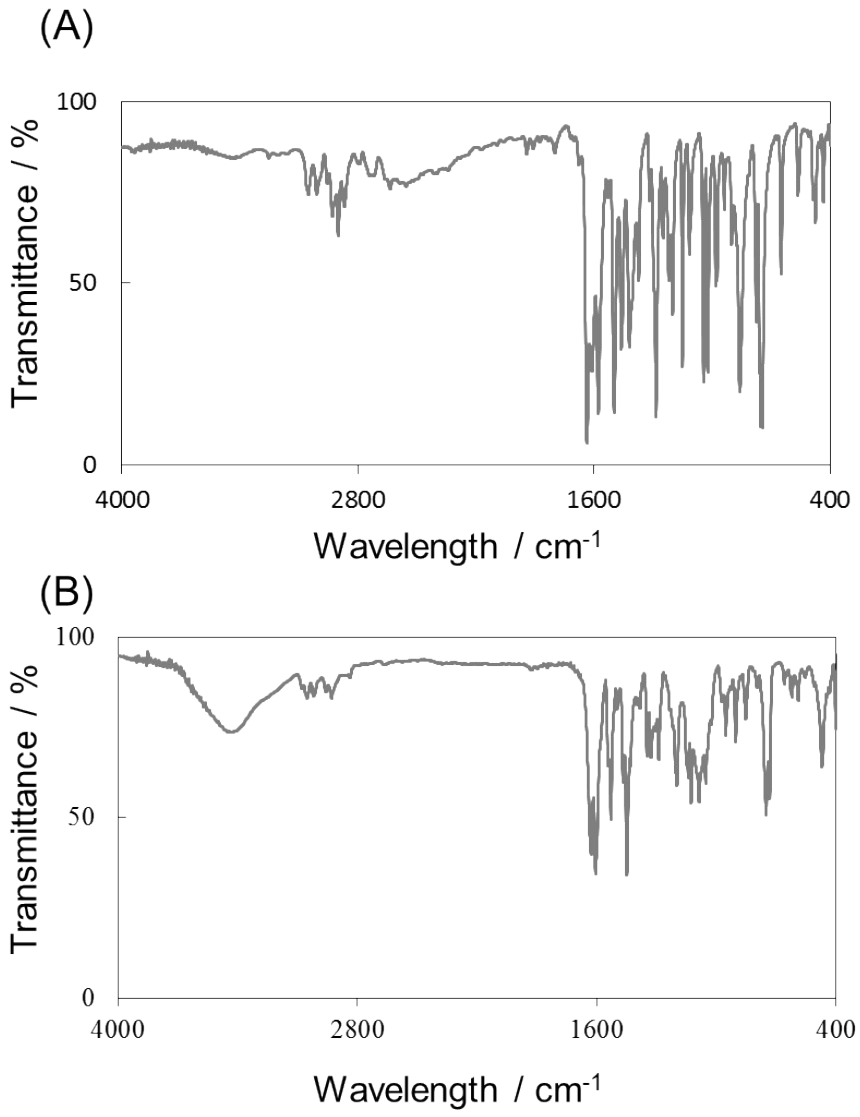

Fig. S2. (a) FT-IR spectra of (A) salen ligand and (B) Co(salen) complex.

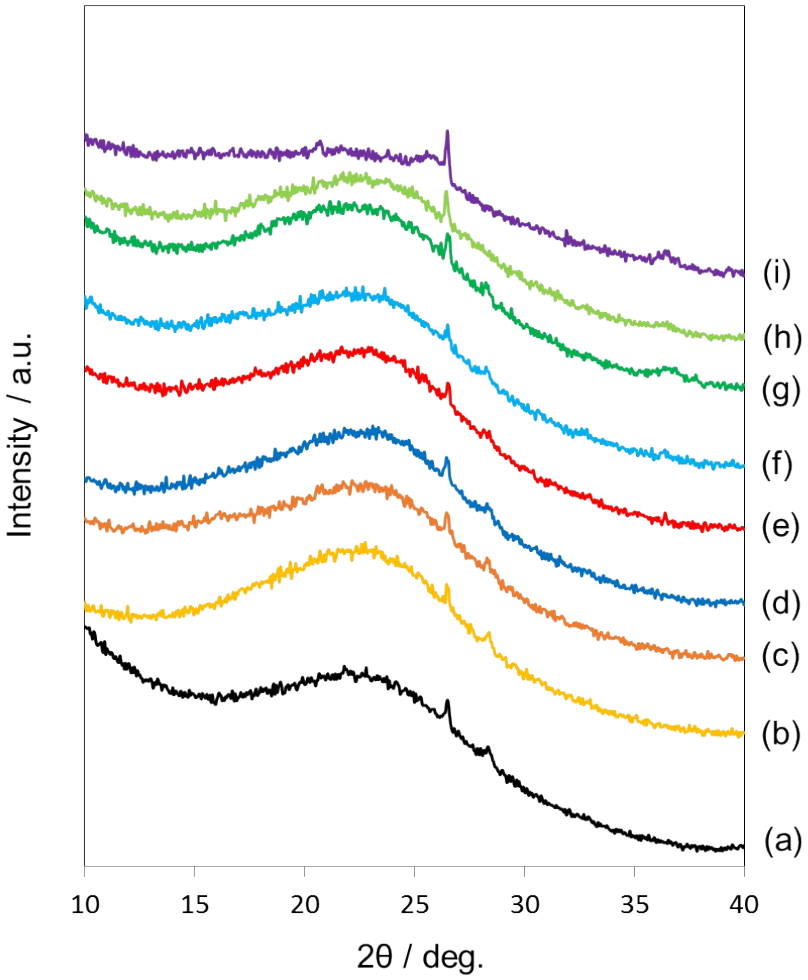

Fig. S3 XRD patterns of Co/AC-salen-T. Calcination temperature T : (a) AC, (b) untreated, (c) 200 ^{o}C, (d) 300 ^{o}C, (e) 400 ^{o}C, (f) 500 ^{o}C, (g) 600 ^{o}C, (h) 800 ^{o}C and (i) 1000 ^{o}C.

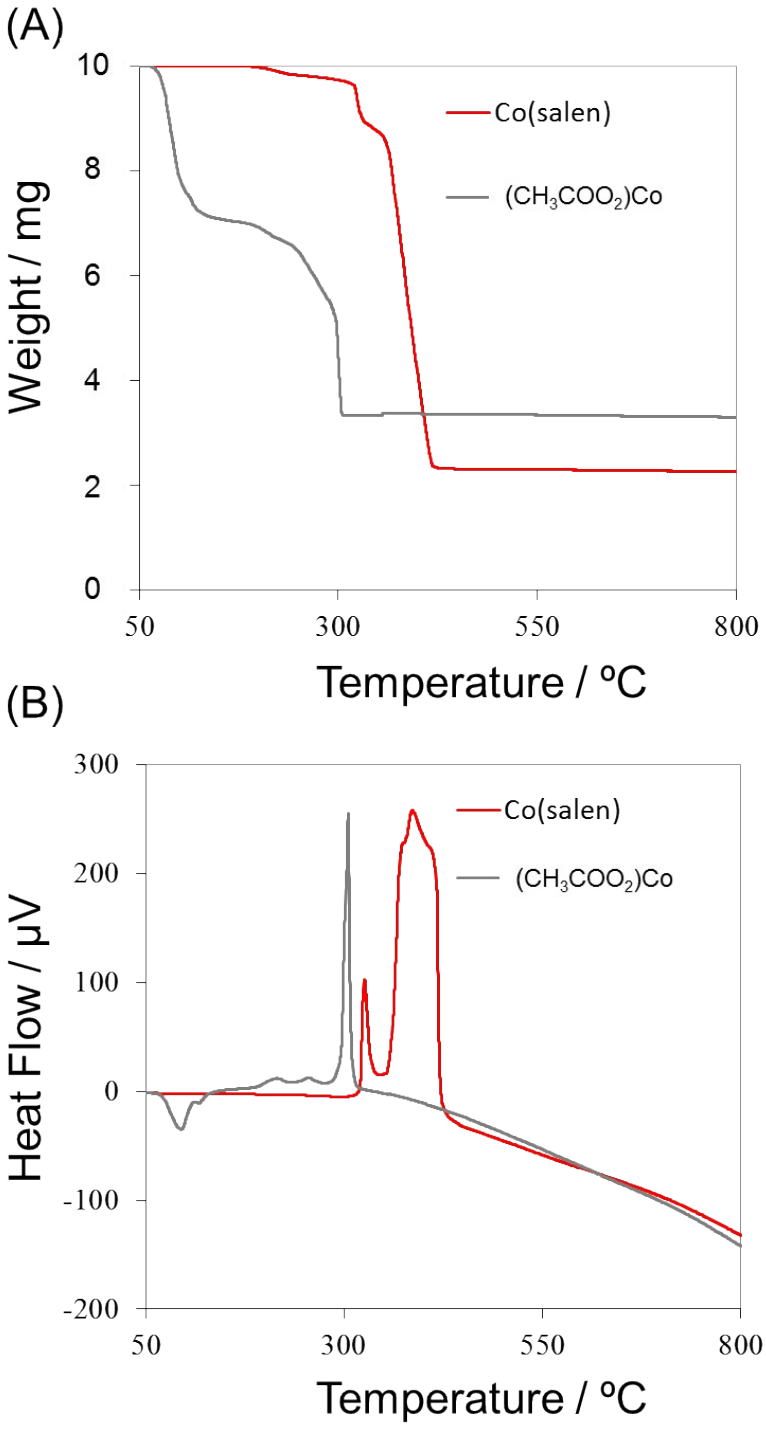

Fig. S4. (A) TG spectra and (B) DTA spectra of Co(salen) and $(CH_3COO)_2Co$.

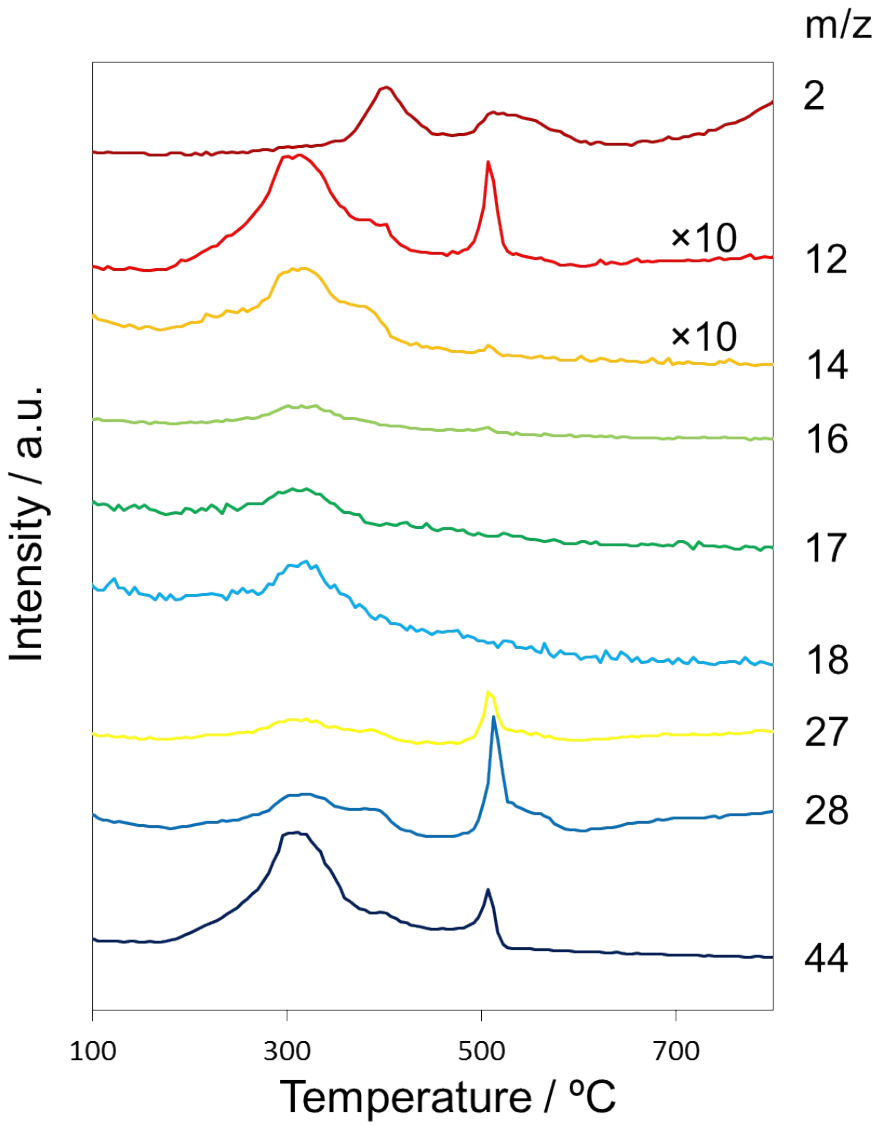

Fig. S5. TPD-MS profile of Co/AC-acetate.

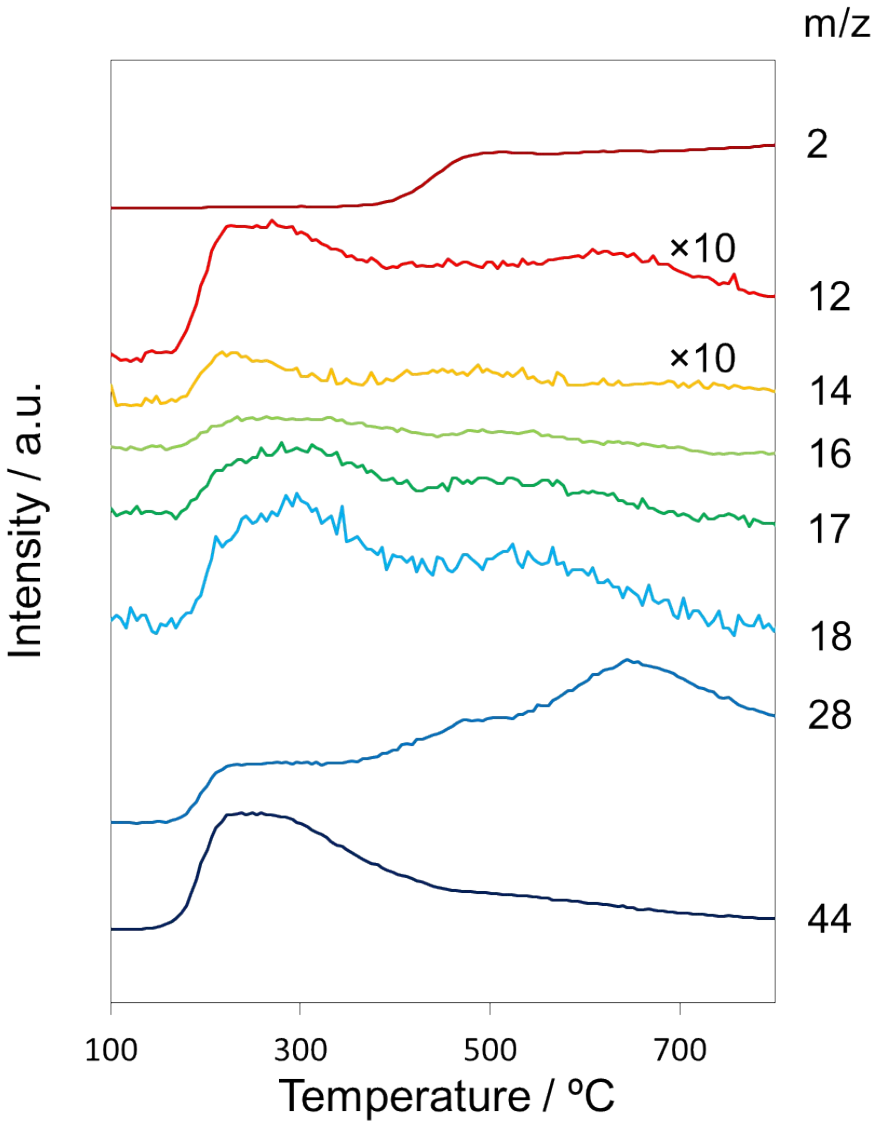

Fig. S6. TPD-MS profile of Co/AC-salen.

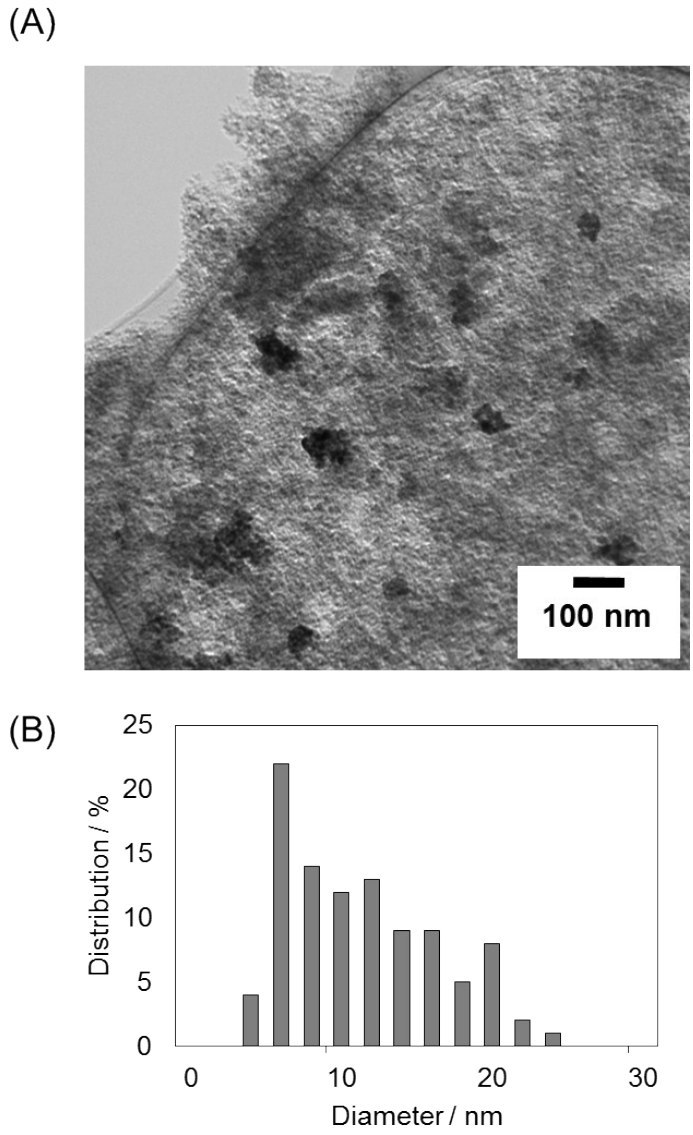

Fig. S7. TEM image (A) and size distribution (B) of Co/AC-acetate-400.

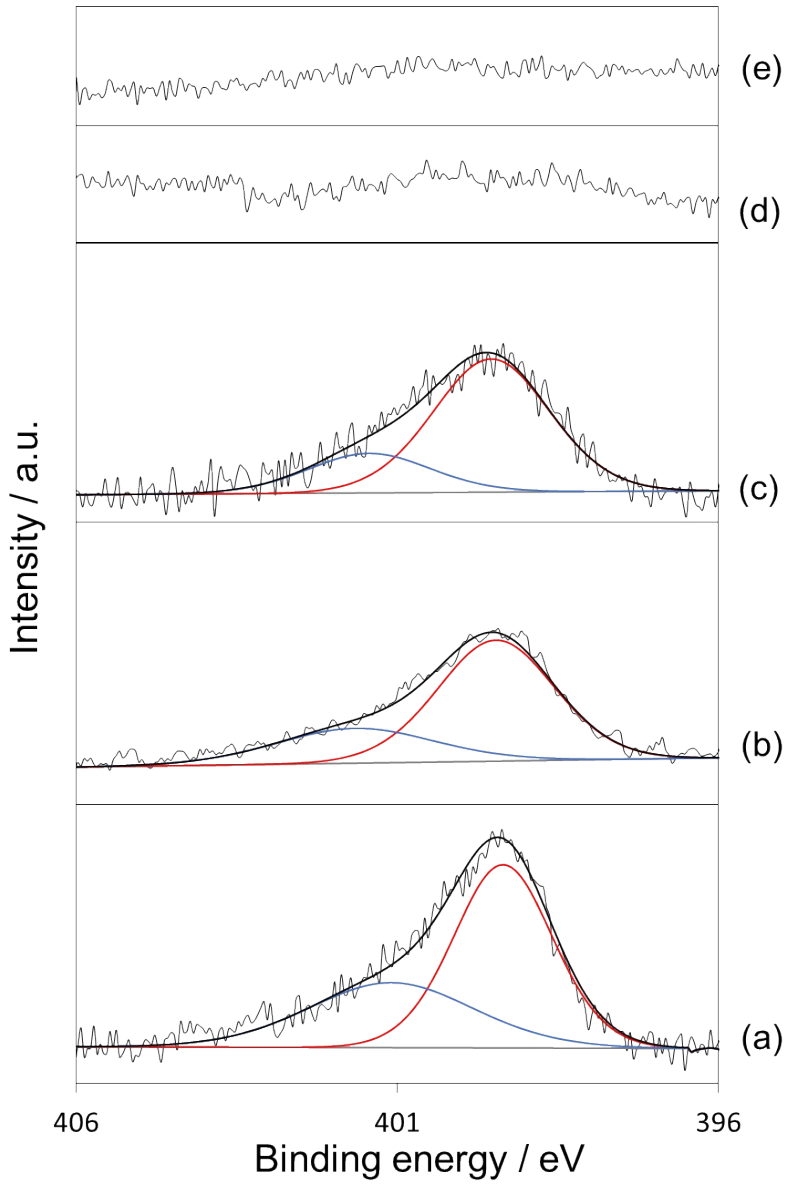

Fig. S8. N 1s XPS spectra of Co/AC-salen-T. T: (a) untreated, (b) 200 ºC, (c) 400 ºC, (d) 600 ºC, and (e) 800 ºC.

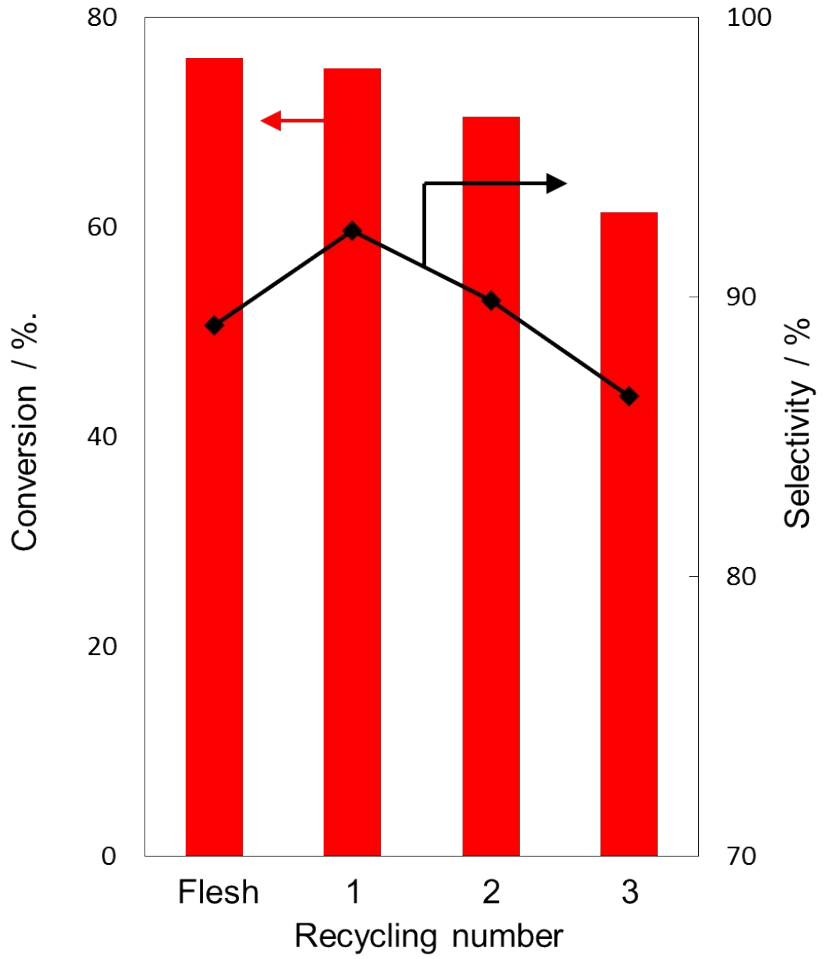

Fig. S9. Conversion of ethylbenzene and selectivity of acetophenone in the recycling test after 24 h over Co/AC-salen-400.

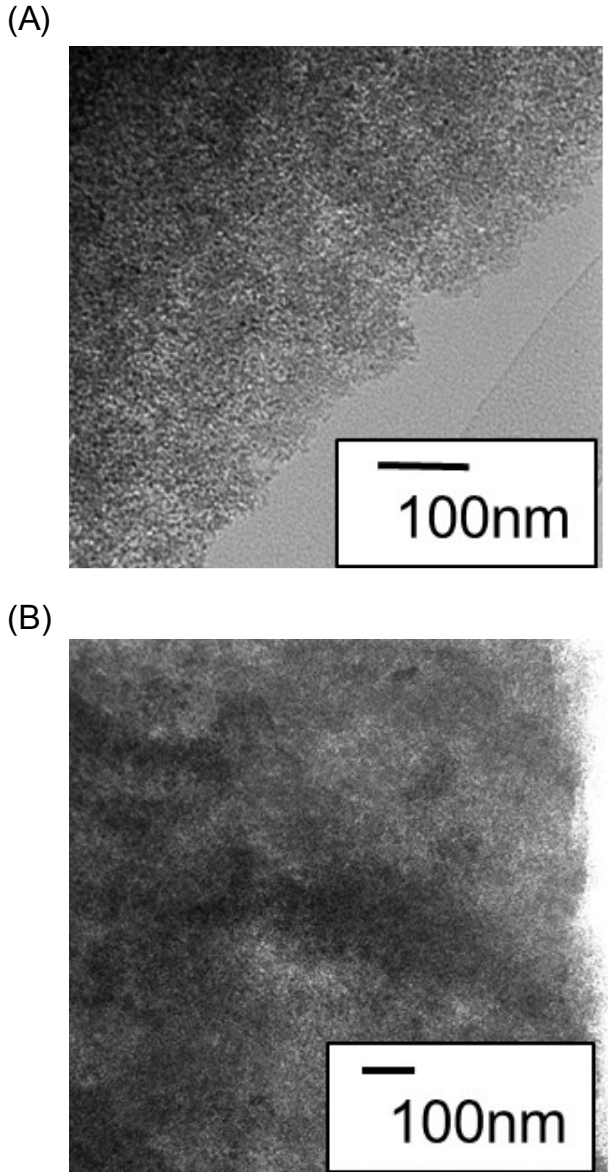

Fig. S10. TEM images of Co/AC-salen-400: (A) fresh catalyst and (B) after recycling test.

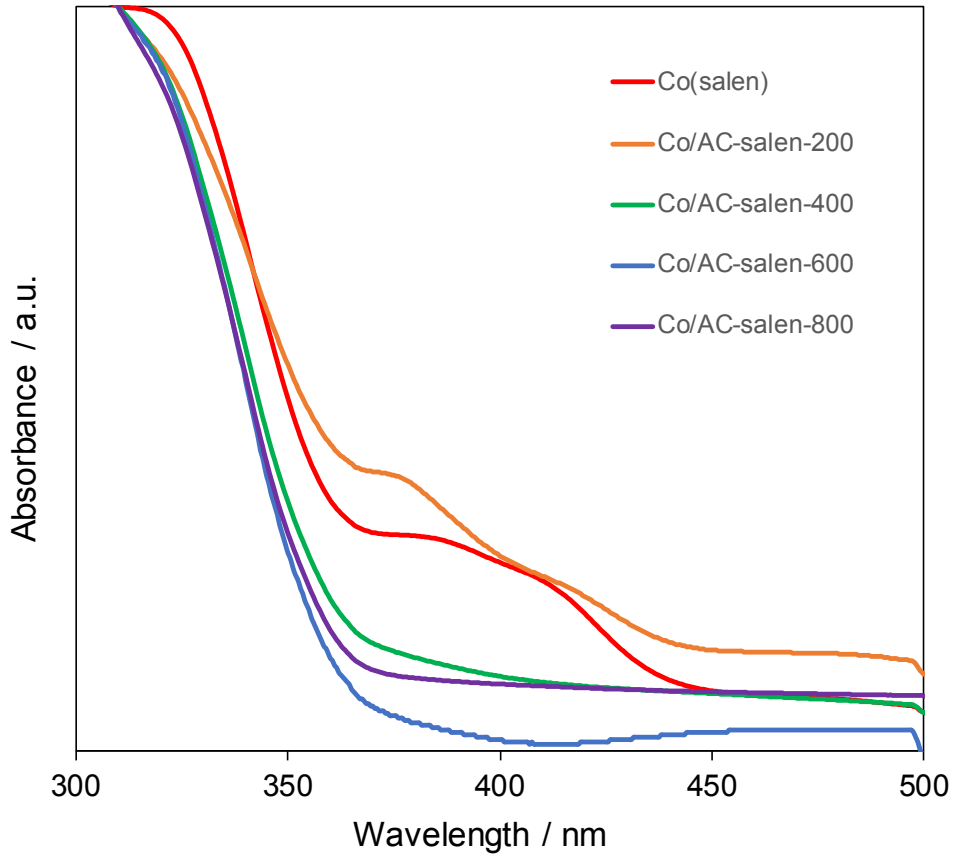

Fig. S11. UV-vis spectra of reaction solution after 24 h of reaction in the oxidation of ethylbenzene over Co(salen) and Co/AC-salen-T (T: 200 ºC, 400 ºC, 600 ºC and 800 ºC).