

Supplementary Data

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- 1- XPS Spectra of (A) Wide Scan Spectra, (B) O 1s, (C) C 1s, (D) Co 2p, (E) P 2p and (F) La 3d_{5/2} Core Levels for the $\text{Co}_3\text{O}_{4(20\%)}\text{-La}_2\text{O}_{3(20\%)}\text{/AC}_{\text{nano}}$ catalyst.
- 2- (A-B) Effect of water content on DO of WCO and (C-D) Effect of FFA of DO of WCO under optimum condition 1 wt.%, at 330 °C for 60 min under microstructured batch close system.
- 3- (A) Reusability of $\text{Co}_3\text{O}_{4(20\%)}\text{-La}_2\text{O}_{3(20\%)}\text{/AC}_{\text{nano}}$ catalyst in DO of WCO at temperature of 330 °C, catalyst amount of 1 wt.% and reaction time of 60 min using microstructured batch close system, (B) XRD diffraction profile (B) TGA profiles for fresh and spent $\text{Co}_3\text{O}_{4(20\%)}\text{-La}_2\text{O}_{3(20\%)}\text{/AC}_{\text{nano}}$ catalyst after 8th runs.

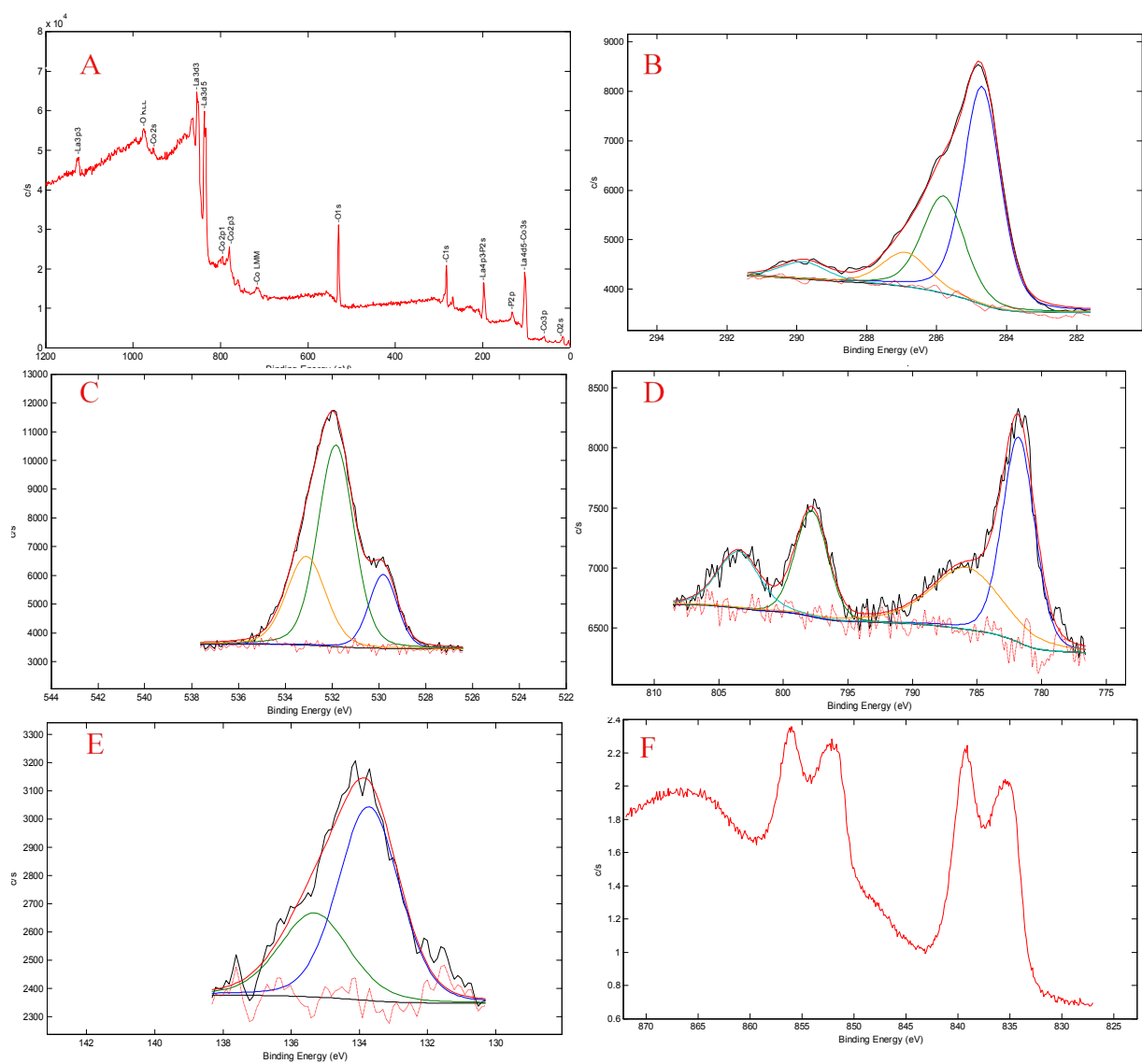


Fig. 1S. XPS Spectra of (A) Wide Scan Spectra, (B) O 1s, (C) C 1s, (D) Co 2P, (E) P 2p and (F) La 3d₅ Core Levels for the $\text{Co}_3\text{O}_4(20)\text{-La}_2\text{O}_3(20)/\text{AC}_{\text{nano}}$ catalyst.

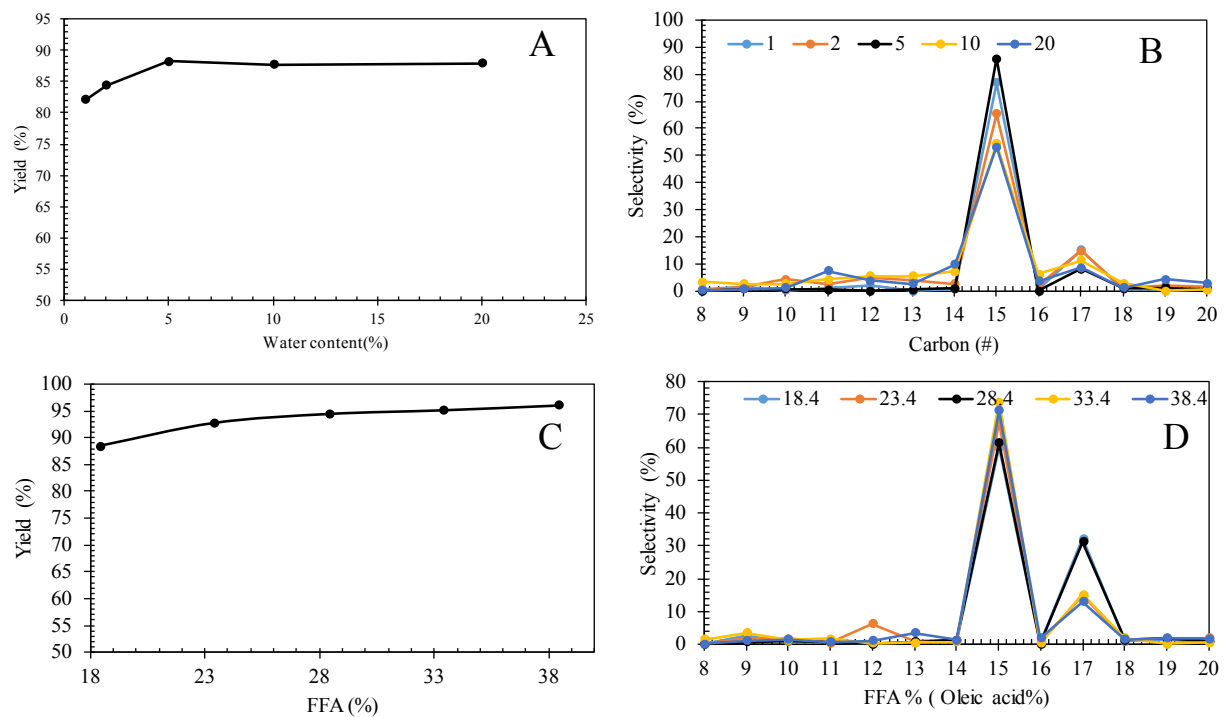


Fig. 2S. (A-B) Effect of water content on DO of WCO and (C-D) Effect of FFA of DO of WCO under optimum condition 1wt.%, at 330°C for 60 min under microstructured batch close system.

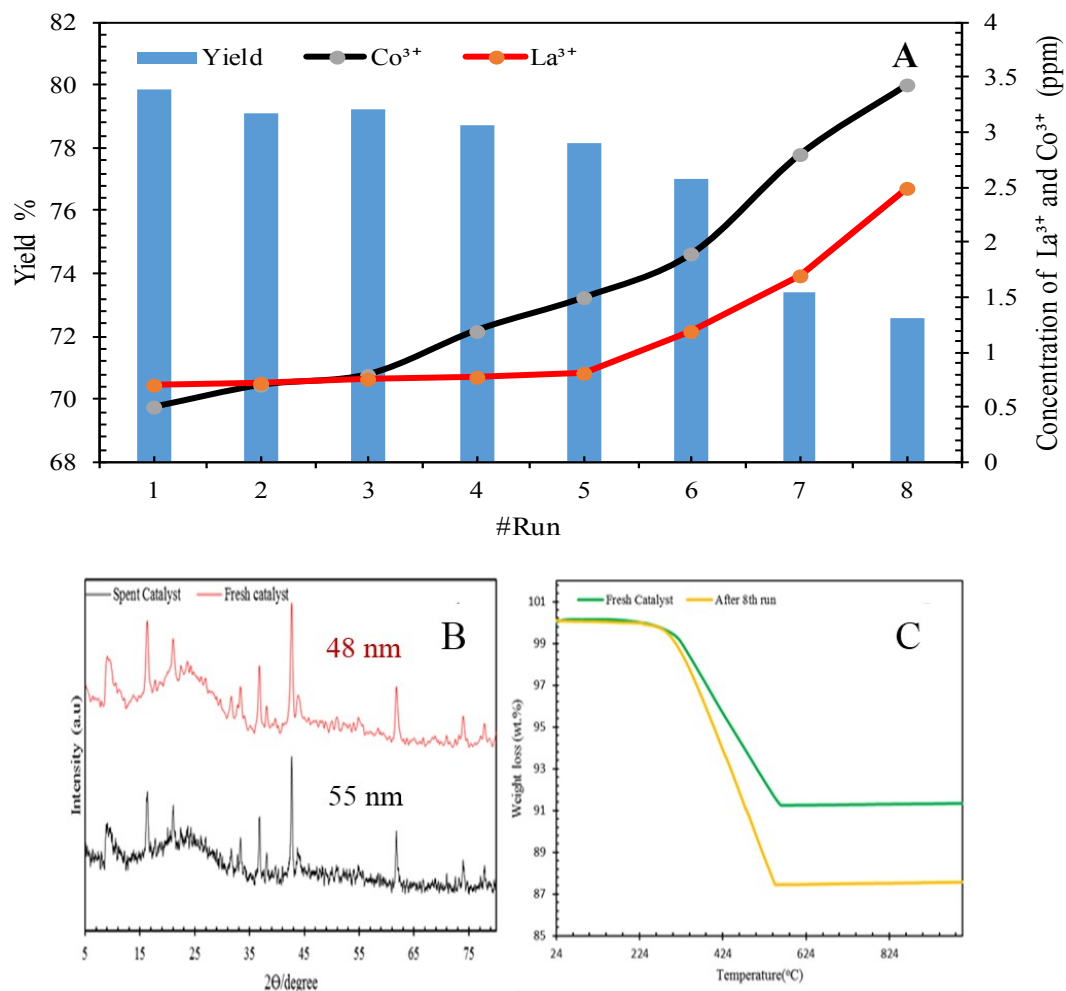


Fig. 3S. (A) Reusability of $\text{Co}_3\text{O}_4(20\%)\text{-La}_2\text{O}_3(20\%)/\text{AC}_{\text{nano}}$ catalyst in DO of WCO at temperature of 330 °C, catalyst amount of 1 wt.% and reaction time of 60 min using microstructured batch close system, (B) XRD diffraction profile (C) TGA profiles for fresh and spent $\text{Co}_3\text{O}_4(20\%)\text{-La}_2\text{O}_3(20\%)/\text{AC}_{\text{nano}}$ catalyst after 8th runs.

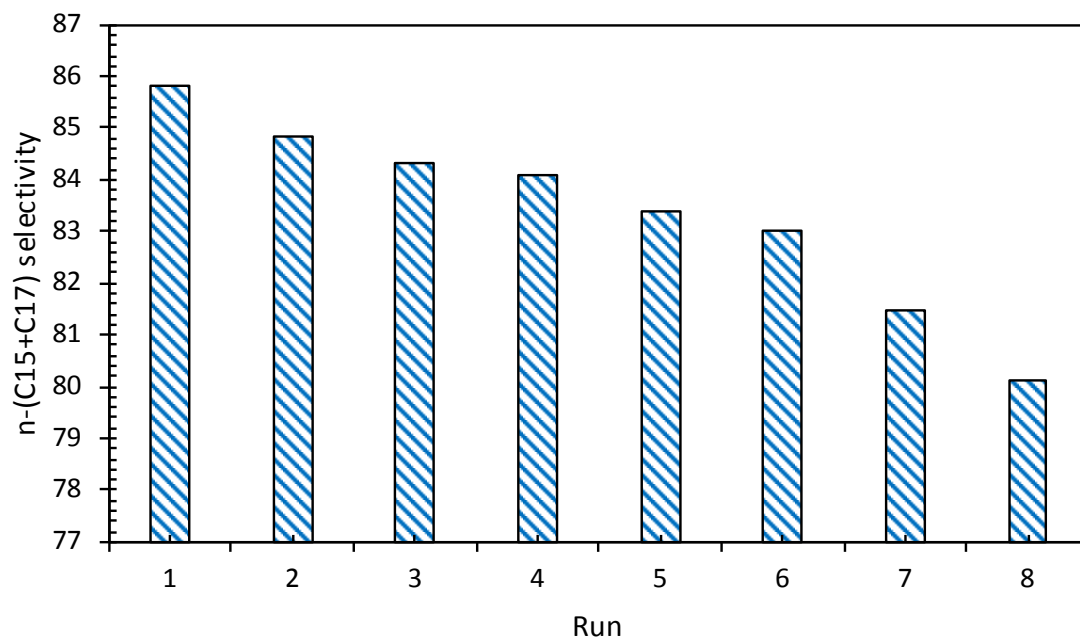


Fig. S4. $n\text{-(C}_{15}\text{+C}_{17})$ selectivity with the number of DO cycles at a temperature of 330 °C, catalyst amount of 1 wt.% and reaction time of 60 min using microstructured batch close system.