

### Supplementary information:

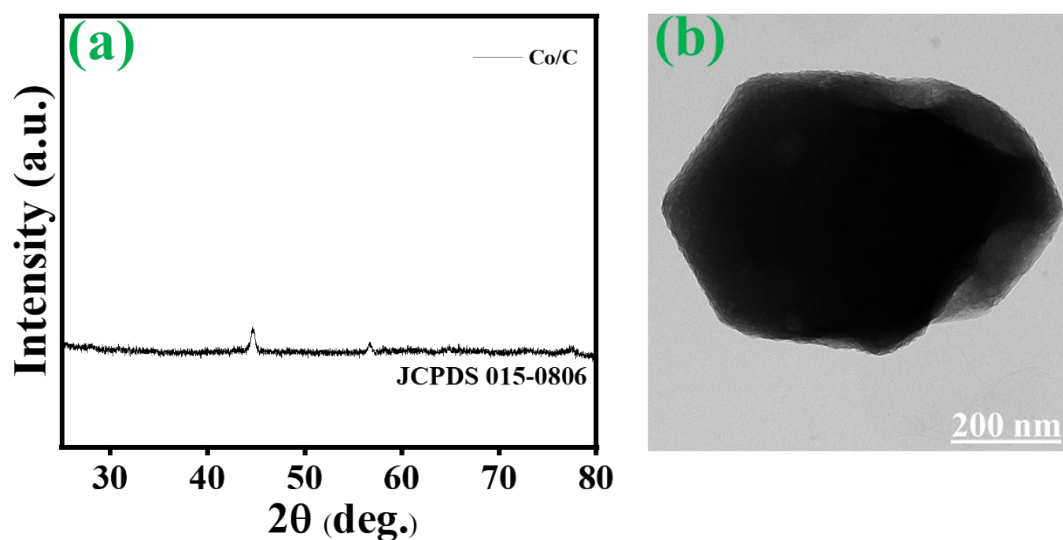


Fig. S1. (a) XRD pattern of intermediate Co/C. (b) TEM image obtained for Co/C.

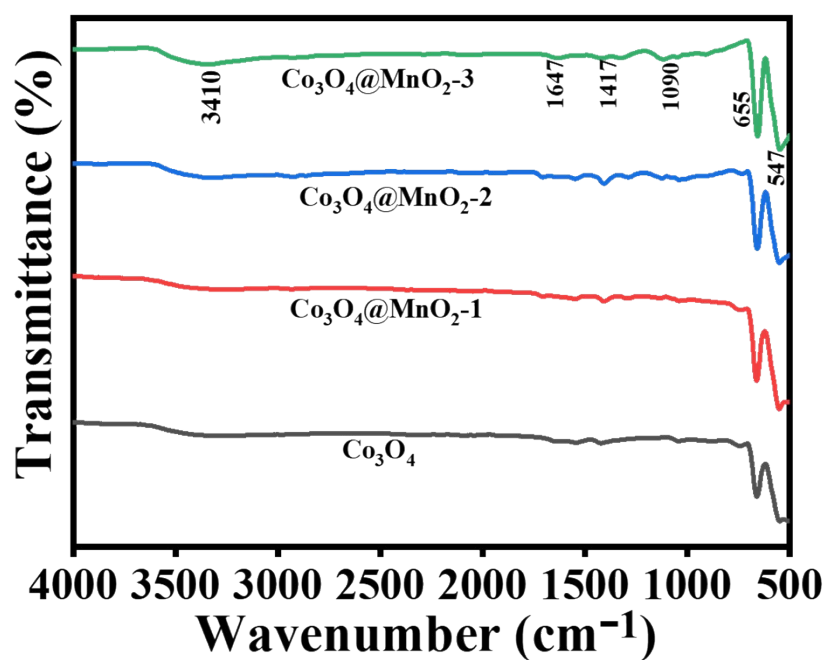


Fig. S2. FTIR analysis of  $\text{Co}_3\text{O}_4$ ,  $\text{Co}_3\text{O}_4@MnO_2-1$ ,  $\text{Co}_3\text{O}_4@MnO_2-2$  and  $\text{Co}_3\text{O}_4@MnO_2-3$

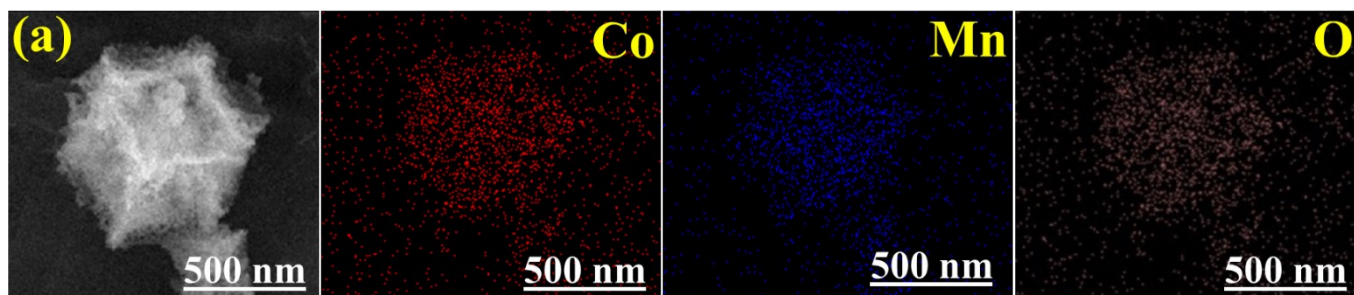


Fig. S3. Elemental mapping of  $\text{Co}_3\text{O}_4@\text{MnO}_2\text{-3}$