Electronic Supplementary Material (ESI) for Catalysis Science & Technology. This journal is © The Royal Society of Chemistry 2014

## **Supplementary Information**



Fig. S1 HRTEM iamges of (a,b) used Au/c-Co<sub>3</sub>O<sub>4</sub>.



Fig. S2 TGA measurements over  $d-Co_3O_4$ ,  $c-Co_3O_4$ ,  $Au/d-Co_3O_4$ , and  $Au/c-Co_3O_4$  in reducing atmosphere (5%H<sub>2</sub>-Ar).



Fig. S3 TEM images of (a) Au/c-Co<sub>3</sub>O<sub>4</sub> and (b) Au/d-Co<sub>3</sub>O<sub>4</sub> after pre-reaction at 350 °C for 5 h.



Fig. S4 Stability tests over Au/c-Co<sub>3</sub>O<sub>4</sub> and Au/d-Co<sub>3</sub>O<sub>4</sub> after pre-reaction at 350 °C for 5 h.