Electronic Supplementary Material (ESI) for Green Chemistry. This journal is © The Royal Society of Chemistry 2016

## Efficient Hydrogenolysis of 5-Hydroxymethylfurfural to 2,5-

## Dimethylfuran over Cobalt and Copper Bimetallic Catalyst on N-

## Graphene-Modified Al<sub>2</sub>O<sub>3</sub>

Weiwei Guo, Hangyu Liu, Suqi Zhang, Hongling Han, Huizhen Liu\*, Tao Jiang\*, Buxing Han, Tianbin Wu

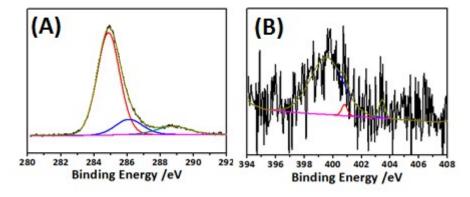


Figure S1 XPS spectrum of NGr/ $\alpha$ -Al $_2$ O $_3$ : (A) C 1s XPS spectra, (B) N 1s XPS spectra

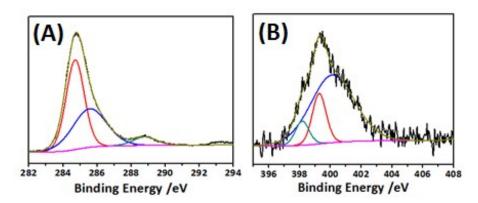


Figure S2 XPS spectrum of Cu/NGr/ $\alpha$ -Al $_2$ O $_3$ : (A) C 1s XPS spectra, (B) N 1s XPS spectra

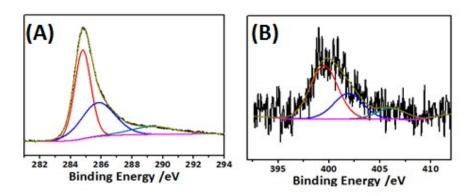


Figure S3 XPS spectrum of  $Cu^{\$}/NGr/\alpha$ -Al $_2O_3$ : (A) C 1s XPS spectra, (B) N 1s XPS spectra

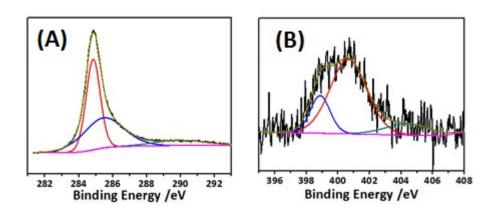


Figure S4 XPS spectrum of Co/NGr/ $\alpha$ -Al $_2$ O $_3$ : (A) C 1s XPS spectra, (B) N 1s XPS spectra

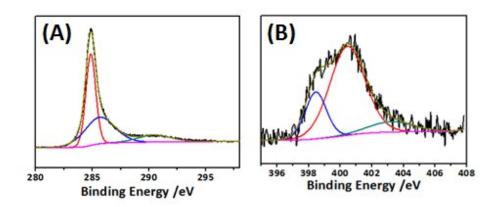


Figure S5 XPS spectrum of  $Co^{@}/NGr/\alpha$ -Al $_2O_3$ : (A) C 1s XPS spectra, (B) N 1s XPS spectra

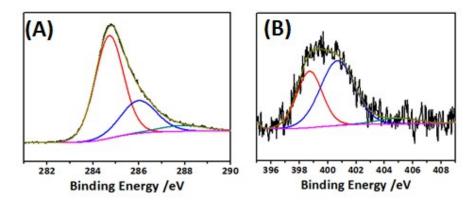


Figure S6 XPS spectrum of  $CuCo^{@}/NGr/\alpha$ -Al<sub>2</sub>O<sub>3</sub> after being reused one time: (A) C 1s XPS spectra, (B) N 1s XPS spectra