Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Supporting Information for

Binary Cu-Co Catalysts Derived from Hydrotalcites with Excellent Activity and Recyclability towards NH_3BH_3 Dehydrogenation

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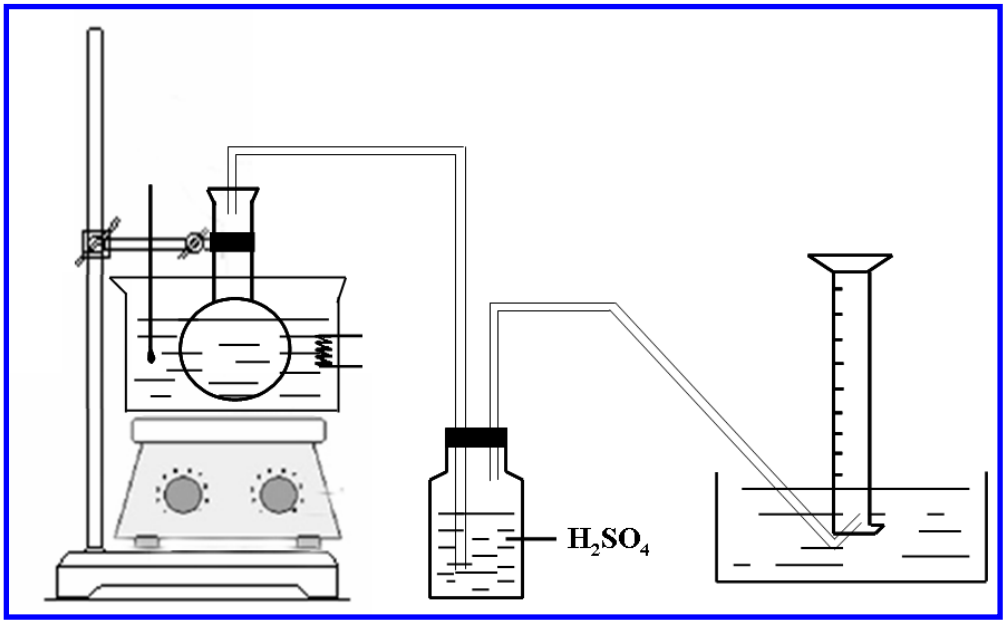


Figure S1. The experimental setup for hydrogen generation from the NH_3BH_3 dehydrogenation.

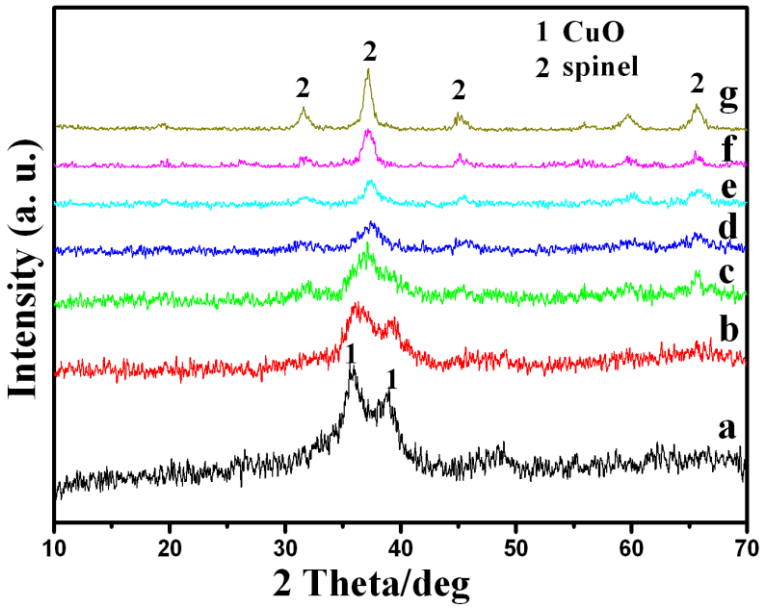


Figure S2. XRD patterns of the $(Cu_xCo_y)_2$Al-MMO samples with various ratios of *x*(Cu) : *y*(Co): a) 1:0, b) 0.87:0.13, c) 0.75:0.25, d) 0.50:0.50, e) 0.25:0.75, f) 0.13:0.87, g) 0:1.

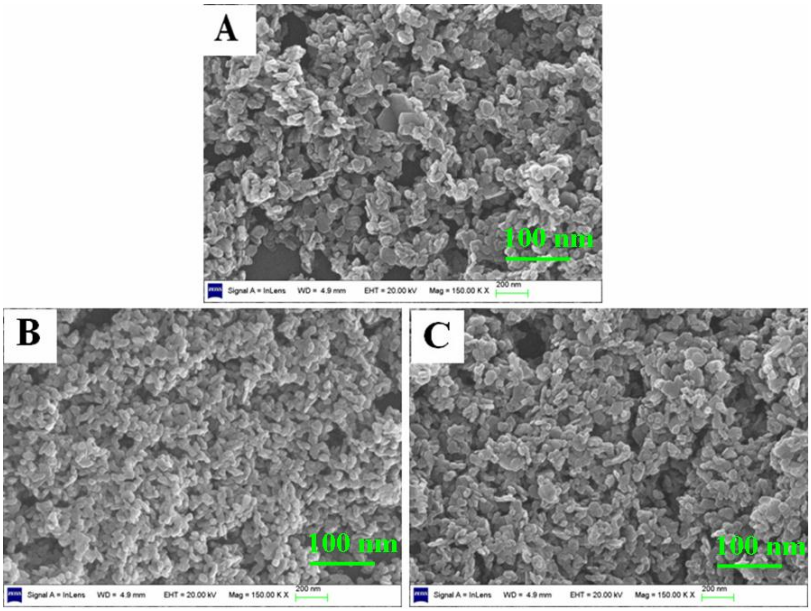


Figure S3. SEM images of the MMO samples: A) Cu_2Al-MMO, B) $(Cu_{0.50}Co_{0.50})_2$Al-MMO, C) Co_2Al-MMO.

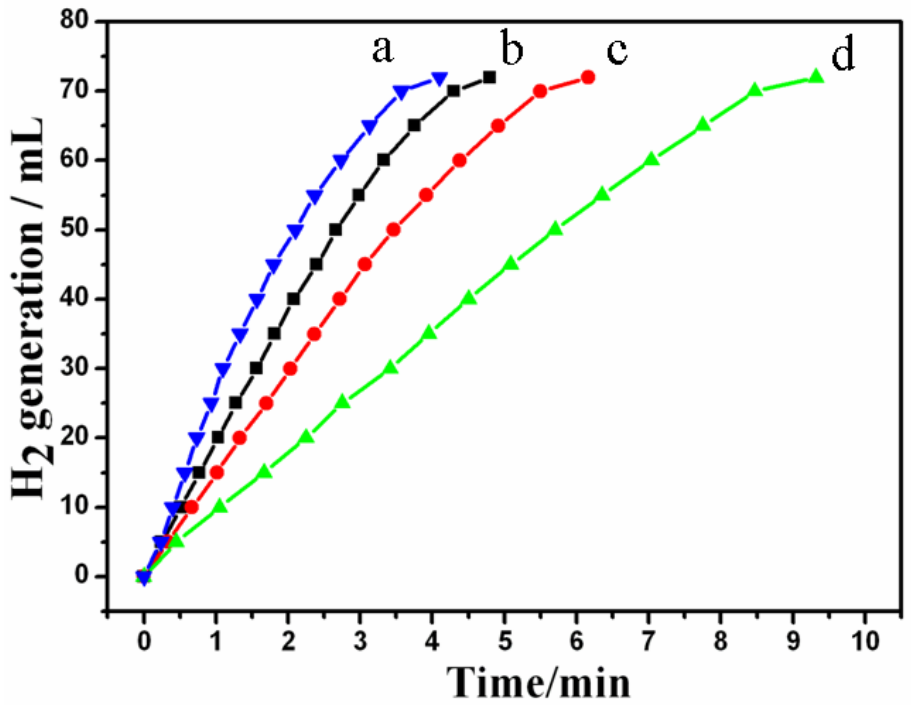


Figure S4. Plot of H_2 volume generated from AB hydrolysis *vs.* time catalyzed by (a) $(Cu_{0.50}Co_{0.50})_2$Al-300, (b) $(Cu_{0.50}Co_{0.50})_2$Al-400, (c) $(Cu_{0.50}Co_{0.50})_2$Al-500, and (d) $(Cu_{0.50}Co_{0.50})_2$Al-600 ($w_{cat.}$= 20 mg, [AB] = 50 mM, (Cu+Co)/AB=0.09, T = 25±1 °C).

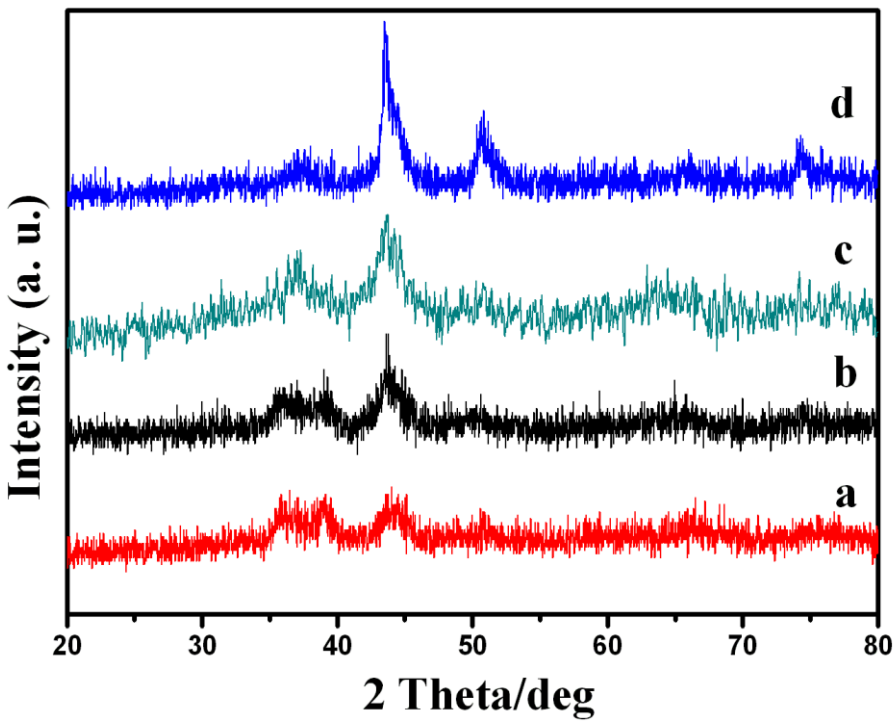


Figure S5. XRD patterns of the $(Cu_{0.50}Co_{0.50})_2$Al-Cat samples obtained by reduction in H_2 at different temperatures: (a) 300 °C, (b) 400 °C, (c) 500 °C, (d) 600 °C.

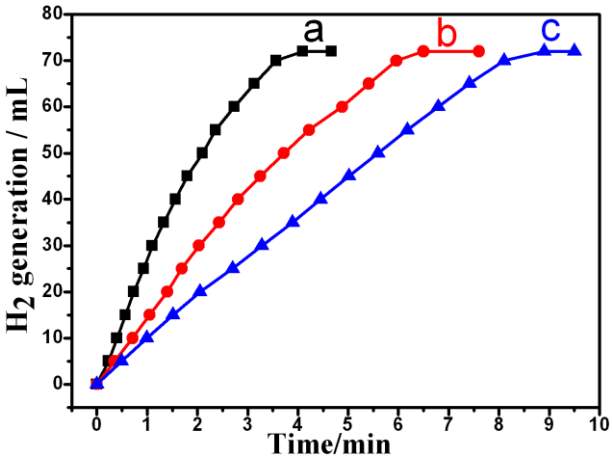
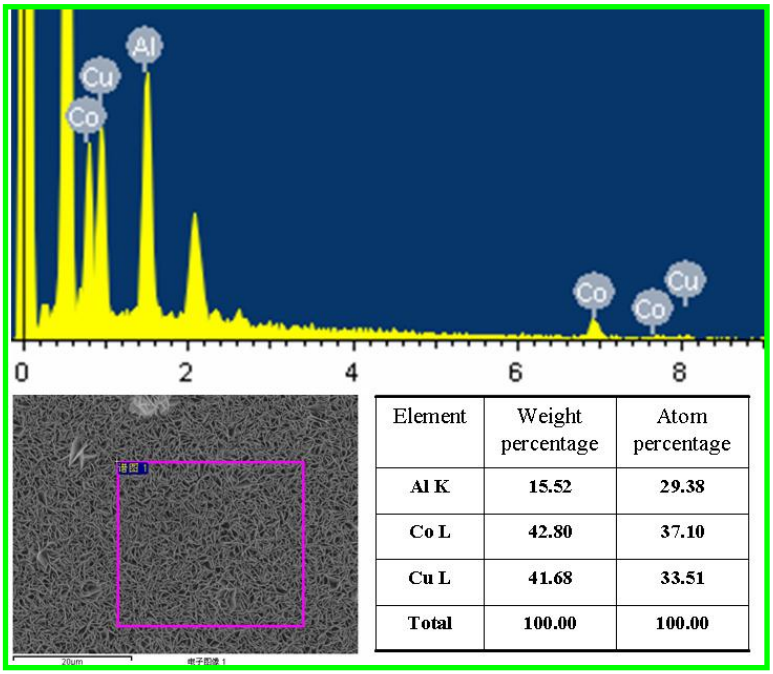


Figure S6. The recyclability for the $(Cu_{0.50}Co_{0.50})_2$Al-Cat powdered catalyst towards NH_3BH_3 dehydrogenation in three consecutive cycles from curve a to c.



Element	Weight percentage	Atom percentage
Al K	15.52	29.38
Co L	42.80	37.10
Cu L	41.68	33.51
Total	100.00	100.00

Figure S7. SEM-EDS analysis for the CuCoAl-LDHs film precursor on Al substrate prepared by the *in situ* growth method.