## Supplementary information for

## Glucose-mediated template-free synthesis of hollow CuO microspheres

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Fig. S1 XRD patterns of samples prepared at different synthesis time. Because only trace amount of sample could be obtained when the reaction time is 1 h, thus the XRD



pattern of this sample is not recorded.

Fig. S2 SEM image of the sample obtained via the direct hydrothermal treatment of

 $Cu(NO_3)_2$ .



Fig. S3 TGA curves of (a) pure  $Cu(NO_3)_2$  and (b) the mixture of glucose and  $Cu(NO_3)_2$  under air atmosphere. The molar ratio of anhydrous glucose to  $Cu(NO_3)_2 \cdot 3H_2O$  is kept at 0.138.



Fig. S4 SEM images of samples obtained using (a)  $CuCl_2$  and (b)  $CuSO_4 \cdot 5H_2O$  as copper source, (c) XRD pattern of (a).

0.0515 g of glucose was also hydrothermally treated with 0.2774 g of CuCl<sub>2</sub> and 0.5175 g of CuSO<sub>4</sub>·5H<sub>2</sub>O (the corresponding molar ratio is kept at 0.138), respectively. The other reaction conditions were maintained constant. Apparently, the two samples show great difference in morphology as compared to the samples prepared using Cu(NO<sub>3</sub>)<sub>2</sub> as copper source. More importantly, CuCl but not CuO is prepared via the hydrothermal reaction between glucose and CuCl<sub>2</sub>, and some unknown impurities could also be identified. The formation of CuCl suggests the reduction capacity of glucose. On the other hand, only trace amount of sample could be obtained by using CuSO<sub>4</sub> as copper source, the corresponding XRD pattern is not recorded. Even though, it could be concluded that different reaction mechanism occurs during the hydrothermal treatment using CuCl<sub>2</sub> and CuSO<sub>4</sub> as metal source, as compared with Cu(NO<sub>3</sub>)<sub>2</sub>.



Fig. S5 XRD patterns of samples prepared using (a)  $Co(NO_3)_2$ , (b)  $Ni(NO_3)_2$ , (c)

 $Fe(NO_3)_3$  and (d)  $Zn(NO_3)_2$  as metal source.