

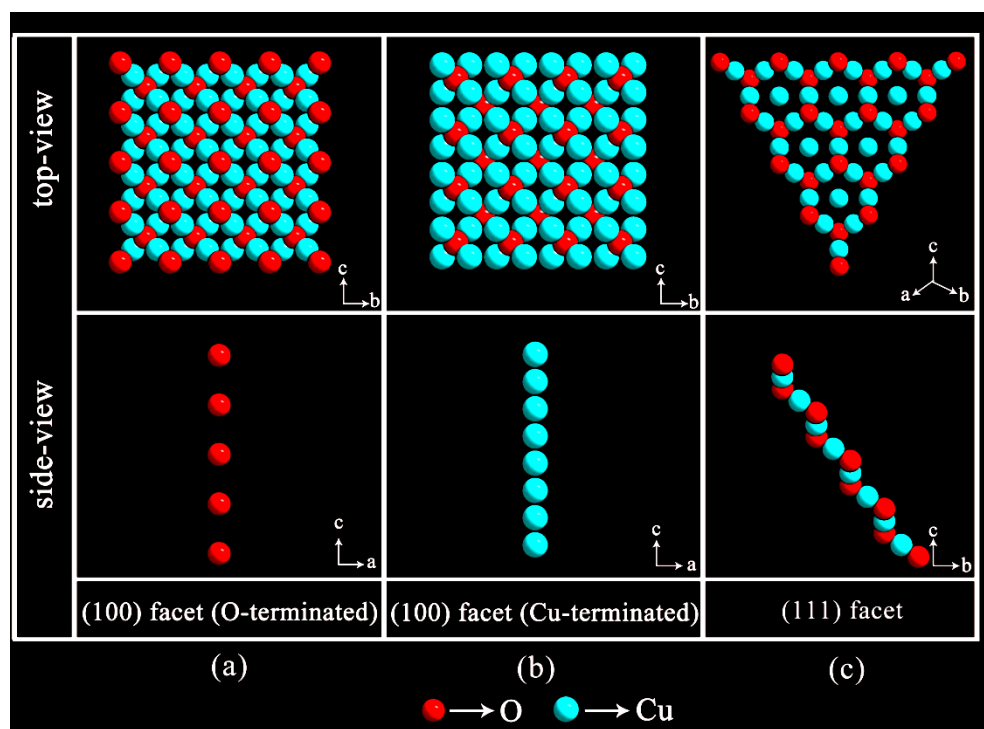
## Electronic Supplementary Information

### Bottom-up assembly of hierarchical $\text{Cu}_2\text{O}$ nanospheres: controllable synthesis, formation mechanism and enhanced photochemical activities

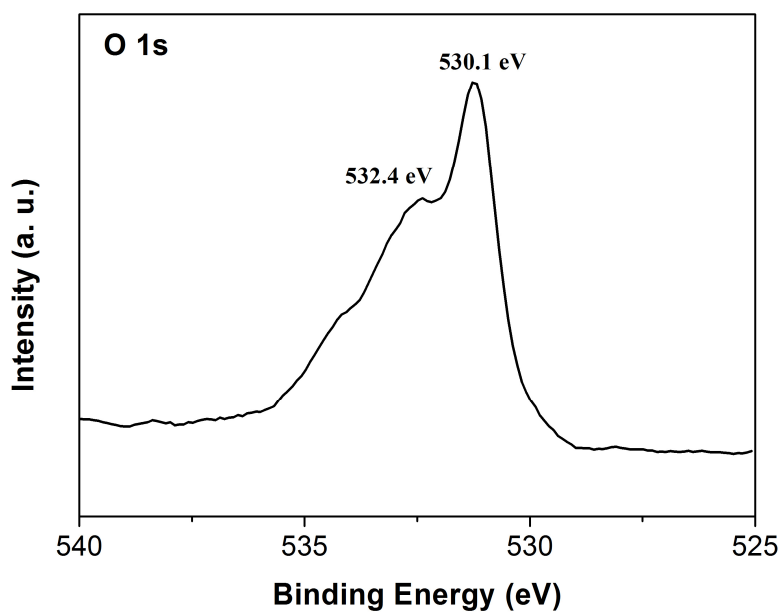
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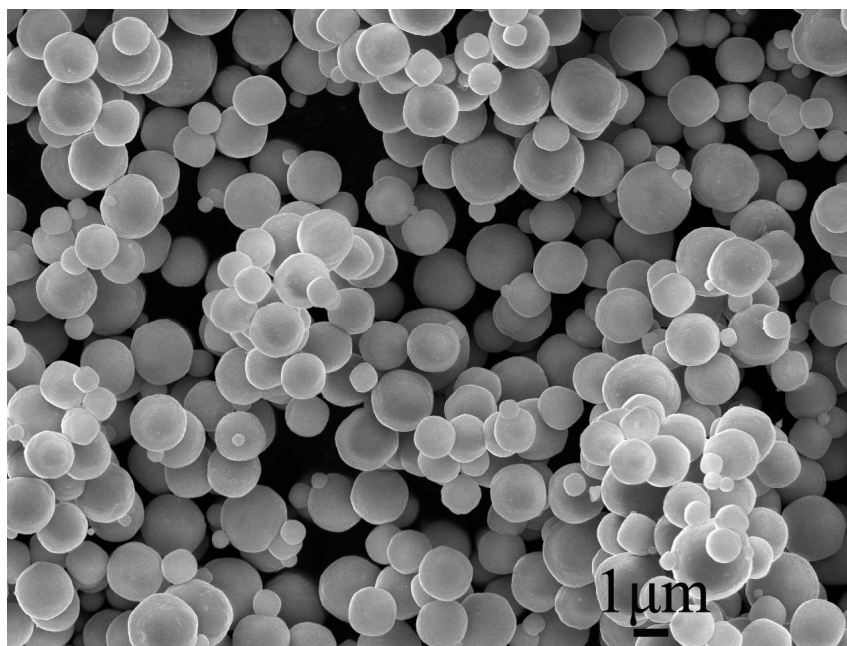
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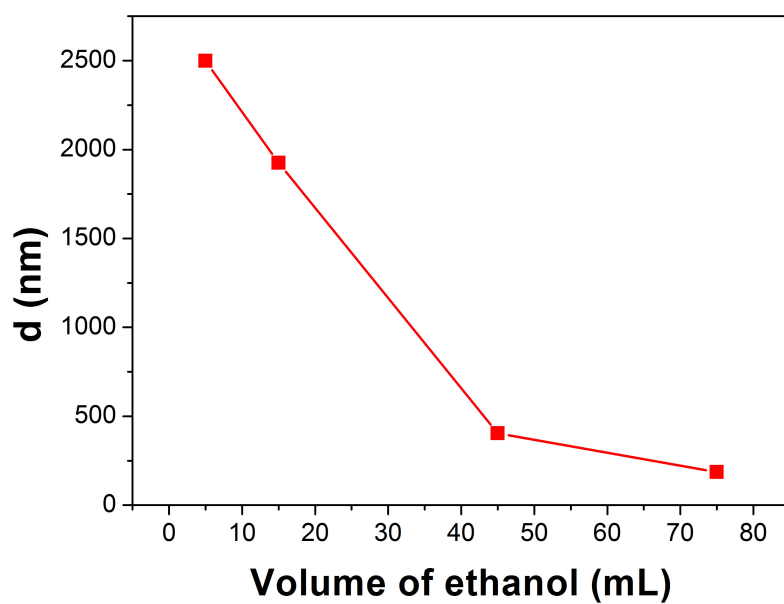
**Fig. S1** The crystallographic structures of  $\{100\}$  (a and b) and  $\{111\}$  (c) facets of  $\text{Cu}_2\text{O}$  crystal.



**Fig. S2** The O 1s XPS spectrum of the as-prepared hierarchical Cu<sub>2</sub>O crystals.



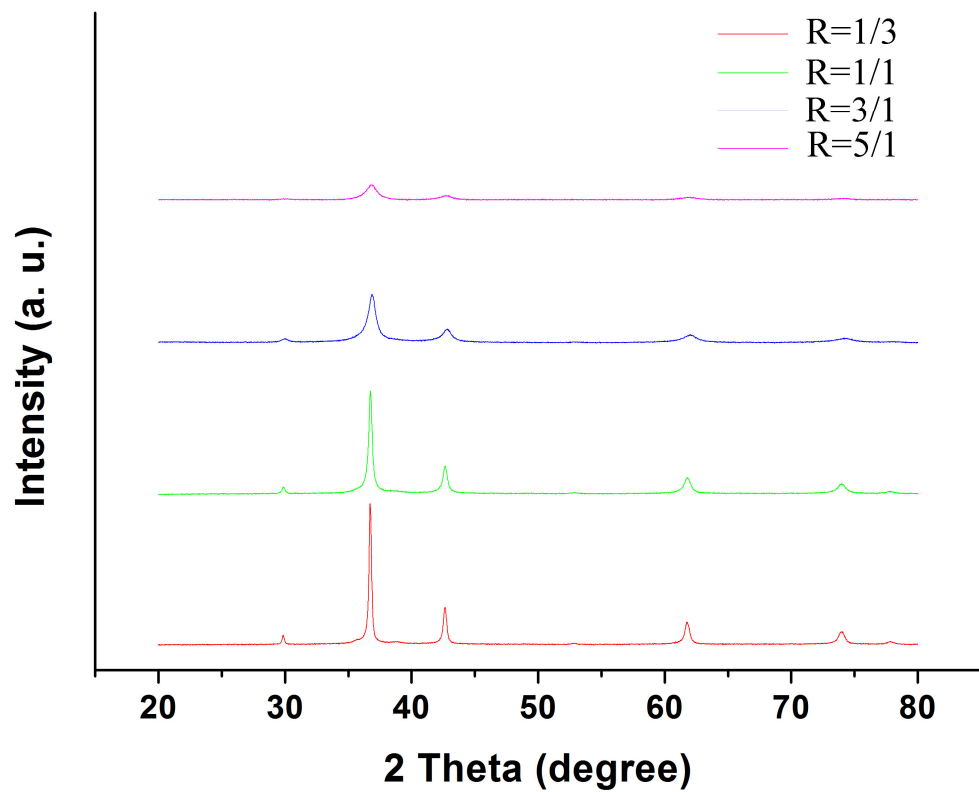
**Fig. S3** FESEM image of the product obtained in the absence of anhydrous ethanol.



**Fig. S4** A plot of the size transformation of the products obtained at different volume of anhydrous ethanol.

**Table 1**

Products	Average size (nm)
Fig. 1c	185 ± 19
Fig. 4e	2497 ± 130
Fig. 4f	1925 ± 118
Fig. 4g	404 ± 30
Fig. 5c	466 ± 32
Fig. 5d	150 ± 20



**Fig. S5** XRD patterns of the products obtained in different volume ratio of anhydrous ethanol to ultrapure water ( $R$ ). The inset shows the corresponding  $R$  values.

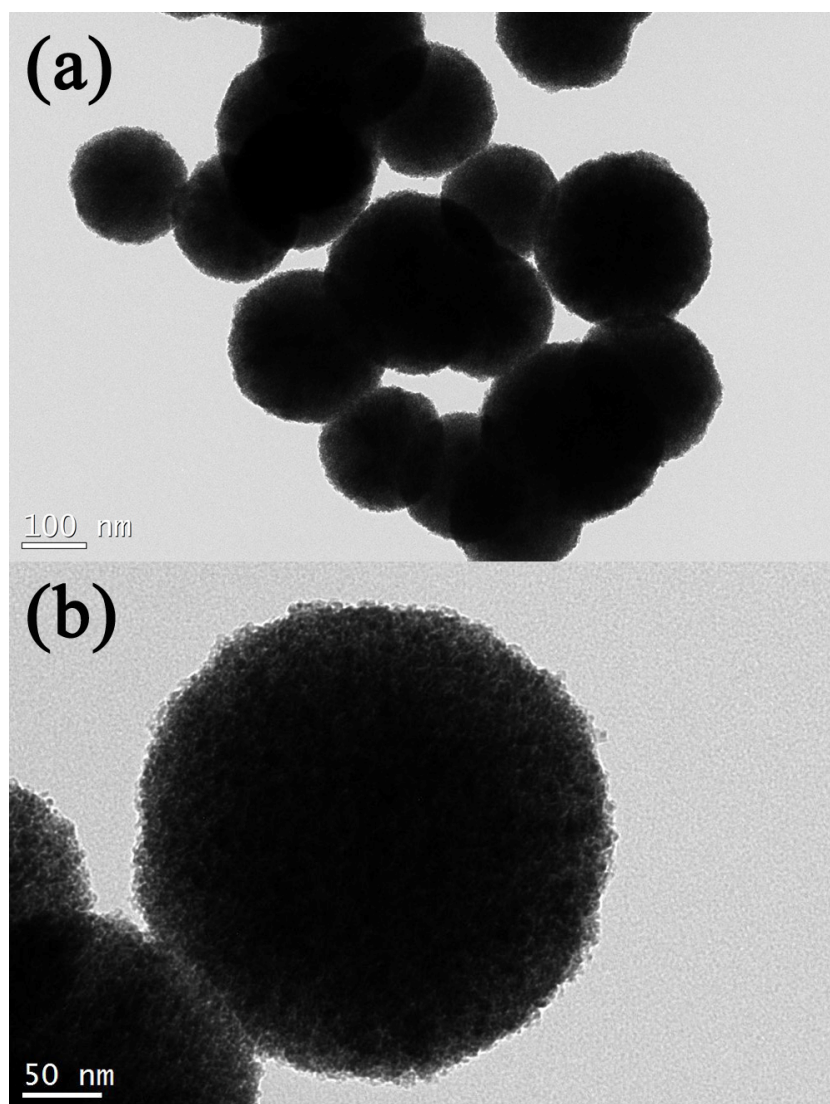


Fig. S6 TEM image of the product obtained in the presence of glycol under otherwise the same reaction conditions.

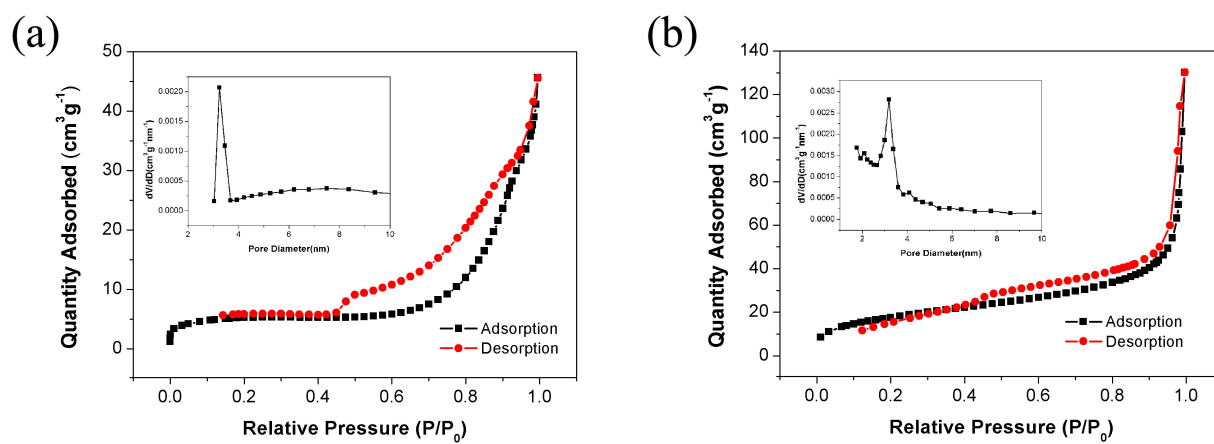


Fig. S7 Typical nitrogen gas adsorption-desorption isotherms and pore size distribution curves (insets) of the hierarchical Cu<sub>2</sub>O nanospheres: (a) sample A; (b) sample B.