

Supporting information

Hydroxyl Ions: Flexible Tailoring of Cu₂O Crystals Morphology

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Table S1. Average particle sizes of the Cu₂O nanocrystals synthesized.

Volume of 1.0 M NaOH	R value	pH value
0.750 mL	1	4.72
1.500 mL	2	5.35
2.250 mL	3	5.52
2.625 mL	3.5	5.73
3.000 mL	4	7.52
3.750 mL	5	8.78
4.500 mL	6	9.44
4.875 mL	6.5	10.75
4.950 mL	6.6	11.34
5.025 mL	6.7	11.81
5.100 mL	6.8	12.07
5.175 mL	6.9	12.23
5.250 mL	7	12.47
6.000 mL	8	12.89
6.750 mL	9	13.16
7.500 mL	10	13.57

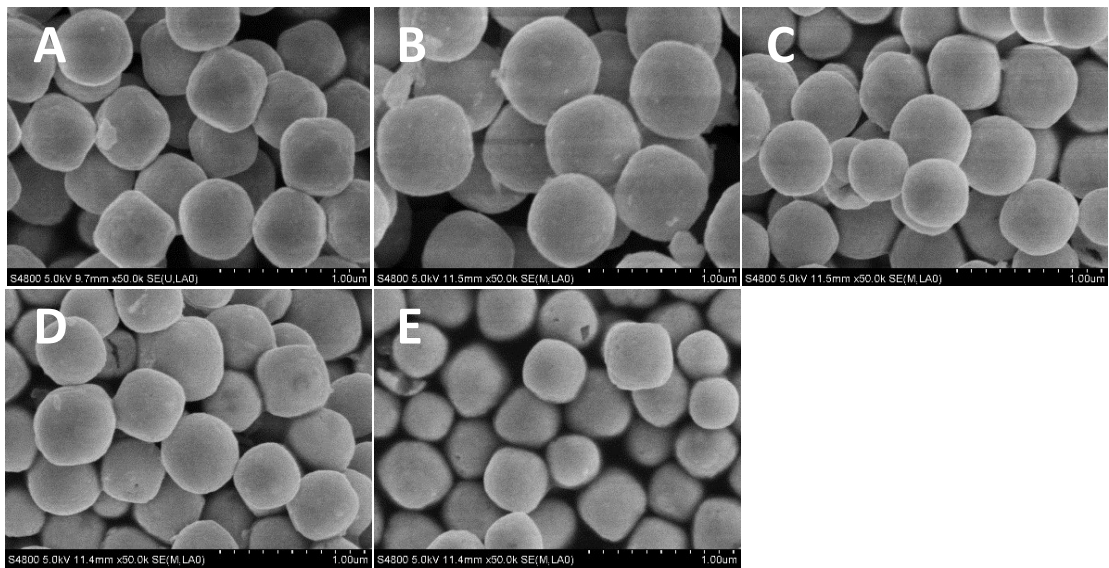


Figure S1. FESEM images of different Cu₂O morphologies obtained with the different molar ratios of OH⁻ to Cu²⁺ (A) 6.5:1, (B) 6.6:1, (C) 6.7:1, (D) 6.8:1 and (E) 6.9:1.

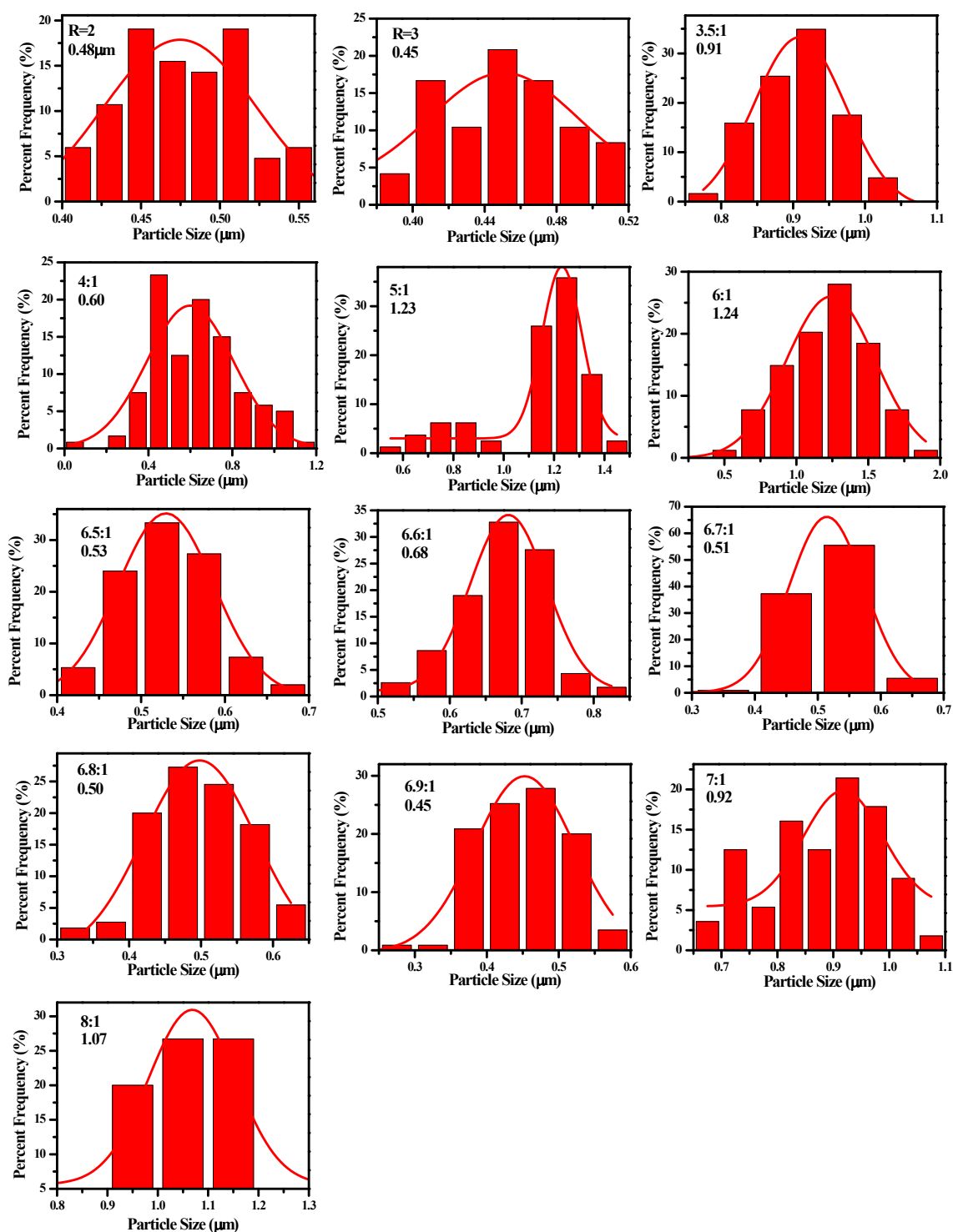


Figure S2. Size distribution histograms for the obtained Cu₂O crystals

Table S2. Average particle sizes and average crystal size of the Cu₂O nanocrystals synthesized.

Sample	Average Particle Size (nm)	Average Crystal Size (nm)
Cu ₂ O (R=2)	480 ± 4.8	34.8
Cu ₂ O (R=3)	450 ± 3.5	33.3
Cu ₂ O (R=3.5)	910 ± 6.7	33.0
Cu ₂ O (R=4)	600 ± 4.2	19.2
Cu ₂ O (R=5)	1230 ± 6.8	27.7
Cu ₂ O (R=6)	1240 ± 12.1	18.7
Cu ₂ O (R=6.5)	530 ± 3.8	26.6
Cu ₂ O (R=6.6)	680 ± 5.8	19.7
Cu ₂ O (R=6.7)	510 ± 3.7	21.0
Cu ₂ O (R=6.8)	500 ± 4.6	22.0
Cu ₂ O (R=6.9)	450 ± 5.2	17.8
Cu ₂ O (R=7)	920 ± 4.8	38.7
Cu ₂ O (R=8)	1070 ± 11.5	40.3
Cu ₂ O (R=9)	1270 ± 13.7	45.3
Cu ₂ O (R=10)	1380 ± 10.8	34.8

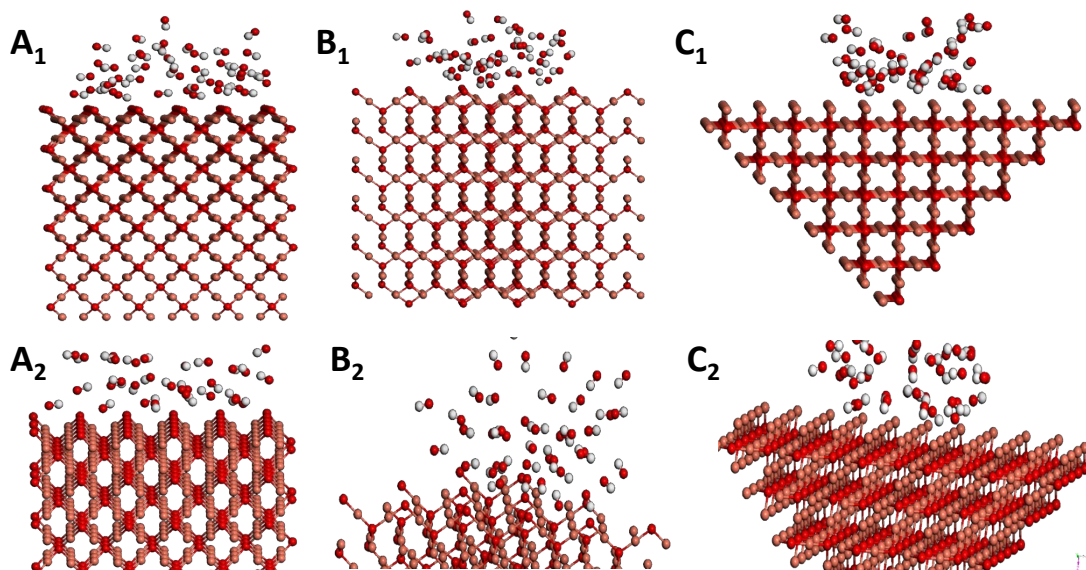


Figure S3. Optimized structures of OH⁻ ions adsorbed on Cu₂O (100) (A₁, A₂), (111) facets (B₁, B₂) and (110) facets (C₁, C₂).

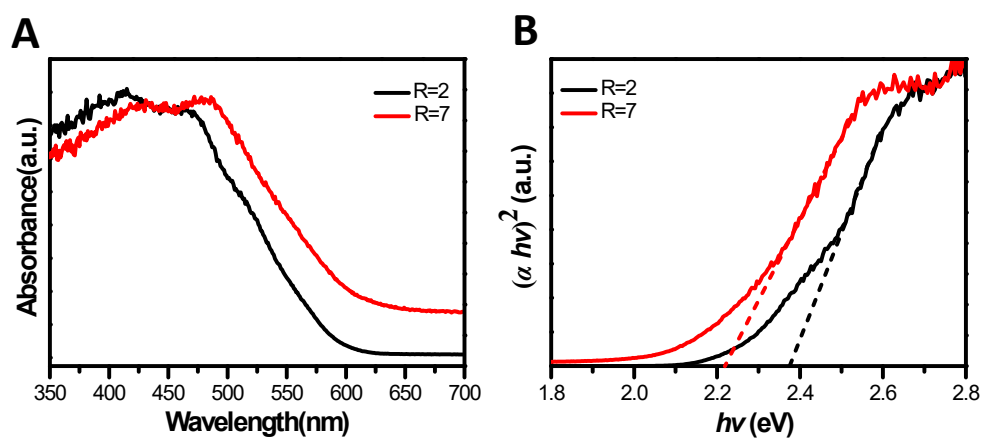


Fig. S4 (A) Reflectance UV-vis absorption spectra and Tauc plots of RD (R=2) and hexapod Cu₂O crystals (R=7).