

Supporting Information

Fabrication of Ultrathin CuO Nanowires Augmenting Oriented Attachment Crystal Growth Directed Self-Assembly of Cu(OH)₂ Colloidal Nanocrystals

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Table S1: The dimension analysis of Cu(OH)₂ nanowires at different stirring time intervals.

Stirring time	Average Length (nm)± SD	Average Diameter (nm) ± SD
5 min	201.9±13.0	2.4± 0.4
10 min	222.2±17.1	2.4± 0.4
15 min	285.4±28.9	5.2± 1.2
30 min	352.1±26.7	5.5± 1.2
45 min	440.6±24.5	5.1± 0.7
1 h	457.3±27.0	5.0± 0.9
2 h	480.9±31.4	5.0± 1.0
3 h	499.6±25.5	5.9± 0.9
4 h	518.2±24.7	5.0± 1.1
5 h	550.7±22.6	5.0± 1.0
6 h	545.6±16.8	5.3± 1.6

Note: Average lengths of nanowires were calculated by taking nanowires with maximum lengths and nanowires with minimum lengths, thus SD represents the deviation of nanowires lengths.

Table S2: Length and diameter of Cu(OH)₂ NWs with respect to different aging time after 4hrs of stirring.

Trial #	Aging time [h]	Average Length (nm) ± SD	Average Diameter (nm) ± SD
1	6	658.7±32.6	6.4± 2.1
2	6	659.3±72.9	7.2± 2.3
3	6	685.7±48.5	7.1± 2.2
4	24	680.0±43.9	5.1± 2.0
5	24	676.9±86.4	5.5± 1.5
6	24	665.9±66.0	5.2± 2.1

Note: Average lengths of nanowires were calculated by taking nanowires with maximum lengths and nanowires with minimum lengths, thus SD represents the deviation of nanowires lengths.

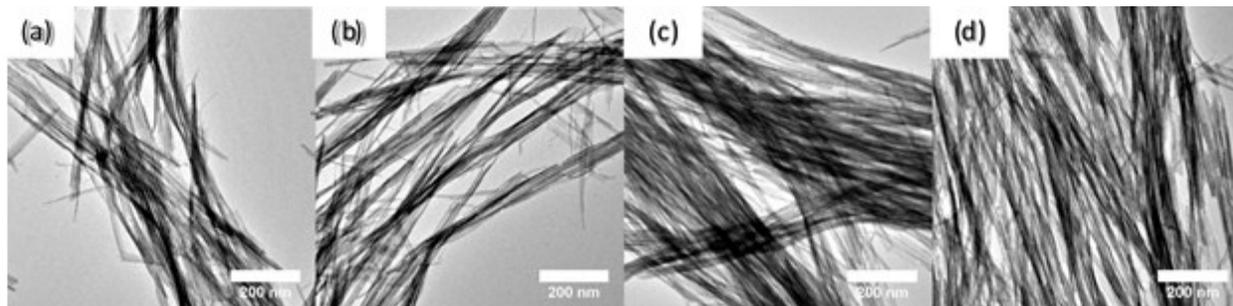


Figure S1: TEM images of fully grown $\text{Cu}(\text{OH})_2$ nanowires at different stirring time intervals followed by different aging time intervals (a) 1 hr stirring followed by 6 hrs aging (b) 1 hr stirring followed by 24 hrs aging (c) 4 hrs stirring followed by 6 hrs aging (d) 4 hrs stirring followed by 24 hrs aging.

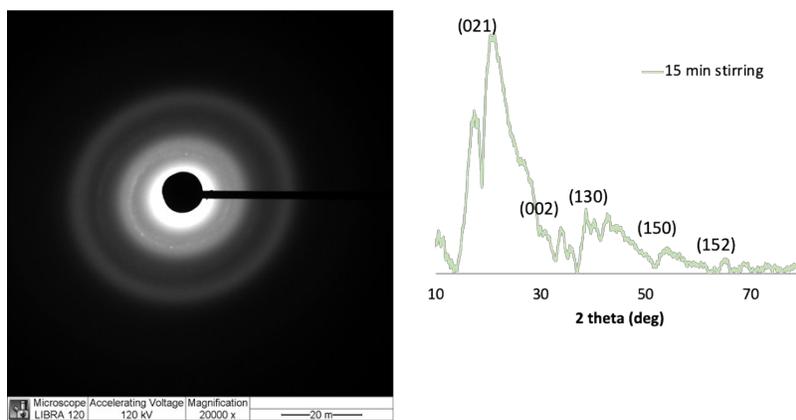


Figure S2: Time dependent SAED pattern along with powder XRD traces of $\text{Cu}(\text{OH})_2$ colloidal nanocrystals at the stirring time of 15 min.

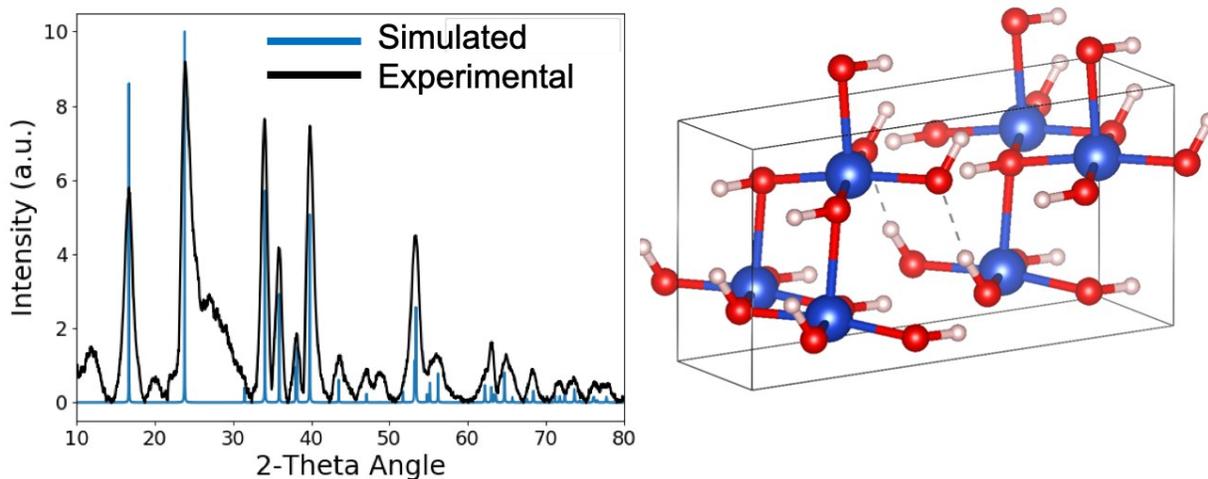


Figure S3: The simulated and experimental powder XRD patterns of Cu(OH)₂ nanowires and its Orthorhombic crystal unit cell obtained from the Crystallographic Open Database (COD #9007849)

Table S3: XPS analysis of before annealed and after annealed NWs

Sample	Peak	Position BE (eV)±0.10 eV	FWHM (eV) ±0.20 eV	Atomic Con. (%)
Cu(OH) ₂ NWs	Cu 2p _{1/2} ; Cu 2p _{3/2}	934.9, 955.0	6.05	31.82
	O 1S	530.5	4.47	62.54
CuO NWs	Cu 2p _{1/2} ; Cu 2p _{3/2}	933.1, 953.0	3.02	40.5
	O 1S	528.7, 530.5	0.94	42.96

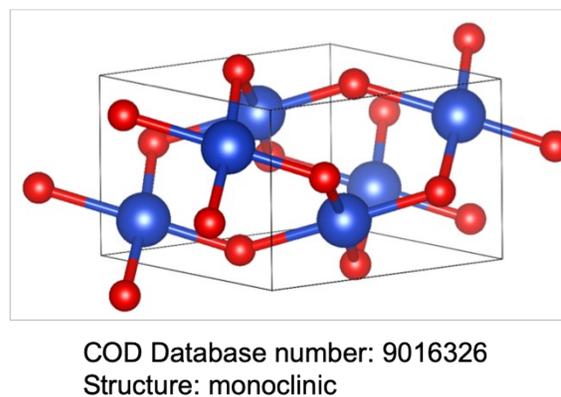
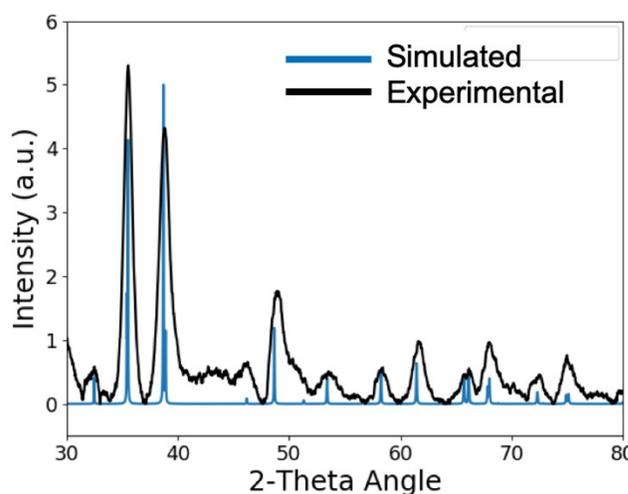


Figure S4: The simulated and experimental powder XRD patterns of CuO nanowires and its Monoclinic crystal unit cell obtained from the Crystallographic Open Database (COD #9016326)

Table S4: Length and diameter of CuO NWs produced upon annealing Cu(OH)₂ nanowires, which were made at 4 hours stirring followed by 6 hours and 24 hours aging respectively. The powder samples of Cu(OH)₂ nanowires were annealed at 300 °C, an hour.

Trial	Aging time [h]	Average Length (µm) ± SD	Average Diameter (nm) ± SD
1	6	5.6±0.4	27.5± 6.0
2	6	5.5±0.3	31.6± 10.7
3	6	5.4±0.3	24.6± 6.9
4	24	7.7±0.4	29.4± 4.4
5	24	7.1±0.3	24.2± 4.4
6	24	7.5±0.3	26.0± 8.6

Note: Average lengths of nanowires were calculated by taking nanowires with maximum lengths and nanowires with minimum lengths. SD represents the deviation of nanowires lengths.