

Electronic Supplementary Information

Growth Mechanism and Microstructures of Cu₂O/PVP Spherulites

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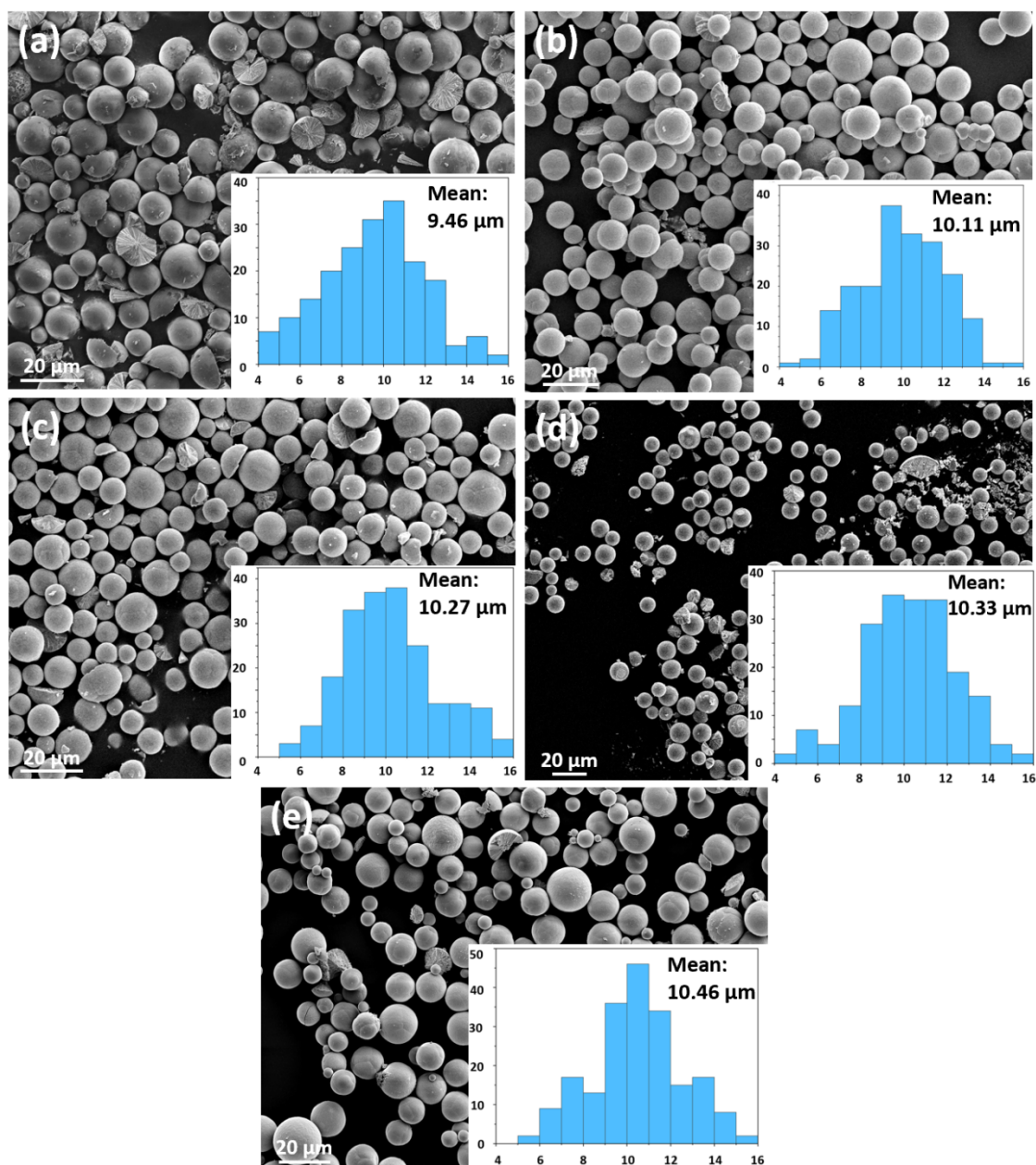


Fig. S1 SEM images of the Cu₂O/PVP spherulites from the samples with reaction times of (a) 1.5, (b) 3, (c) 6, (d) 12 and (e) 96 h. The insets are the corresponding size distribution diagrams of the spherulites. 200 particles for each sample were randomly selected for the measurement.

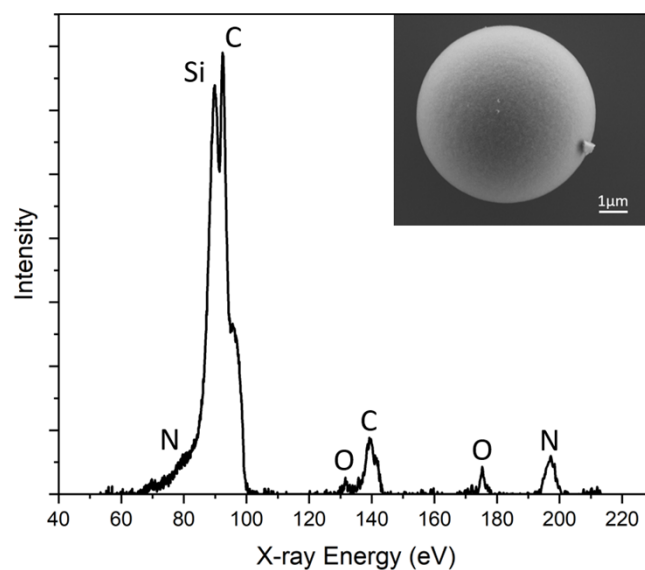


Fig. S2 SXES spectrum of a $\text{Cu}_2\text{O}/\text{PVP}$ spherulite. The Si peak is from the Si substrate. Inset is the corresponding SEM image of the spherulite.

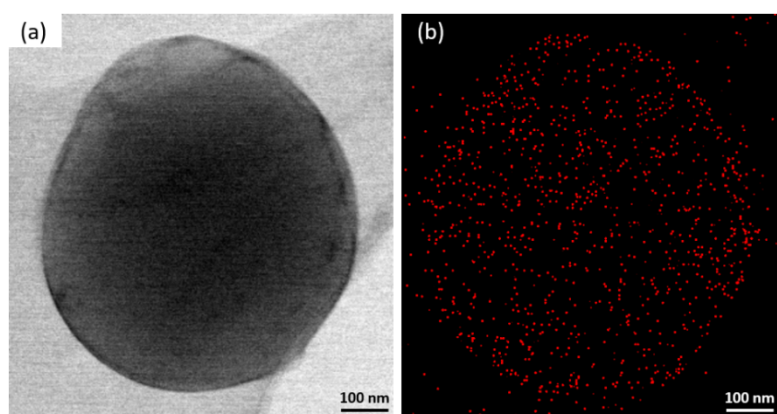


Fig. S3 (a) Bright field TEM image of a submicron sphere from 15 min sample. (b) The corresponding EDX elemental mapping of Cu.

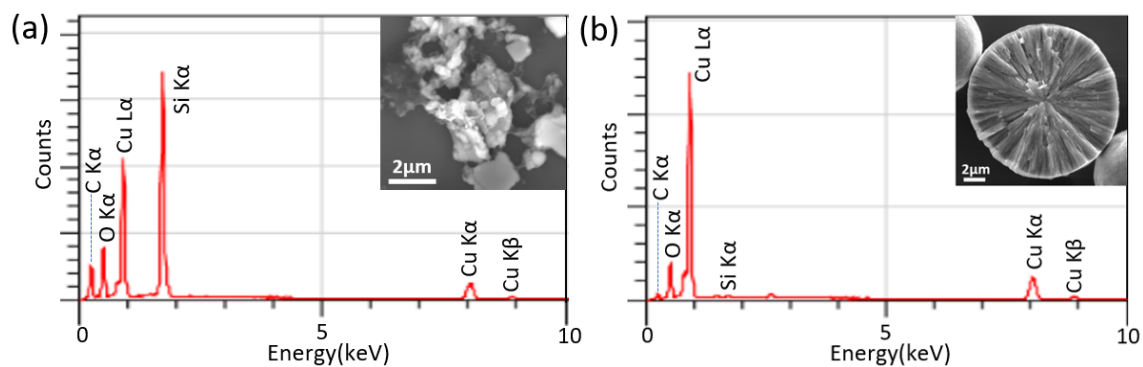


Fig. S4 EDX spectra of (a) the residue in 15 min sample and (b) a spherulite in 1.5 h sample. Insets are the corresponding SEM images of the particles where the spectra were collected.

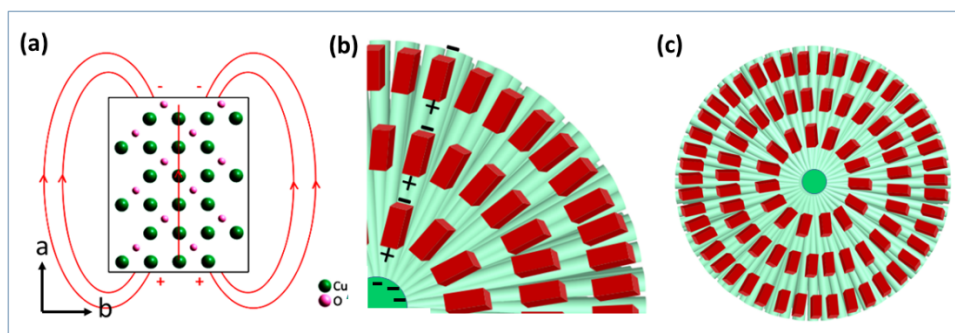


Fig. S5 (a) Structural model of Cu₂O nanocrystal, generating a dipolar field along the [100] axis. (b) Schematic drawing showing the oriented Cu₂O nanocrystallites and corresponding dipole force towards the core. (c) Schematic drawing showing the radial feature of cross section. Red bricks represent Cu₂O nanocrystallites, green substrate represents PVP.

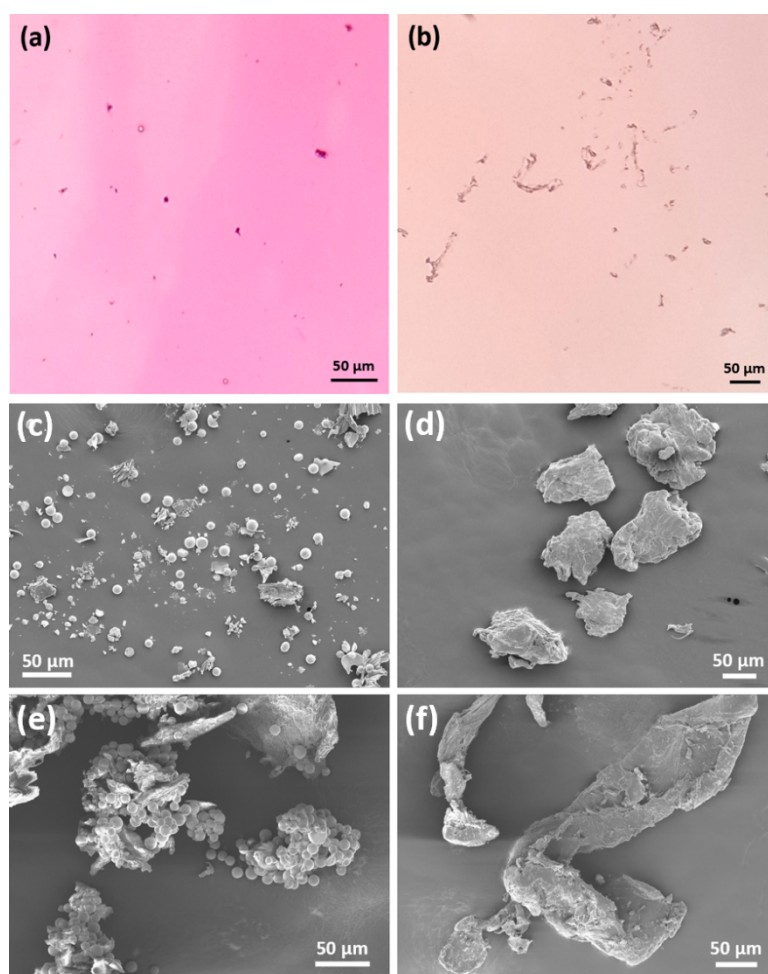


Fig. S6 Optical microscopy images of pure PVP with (a) Safranin T and (b) Congo Red. No obvious interaction happened between PVP and both dyes. SEM images of (c) separated Cu₂O/PVP spherulites from 3 h sample and the negatively charged surfactant, sodium alginate, (d) pure sodium alginate, (e) agglomerated Cu₂O/PVP spherulites on the surface of positively charged surfactant chitosan, (f) pure chitosan.

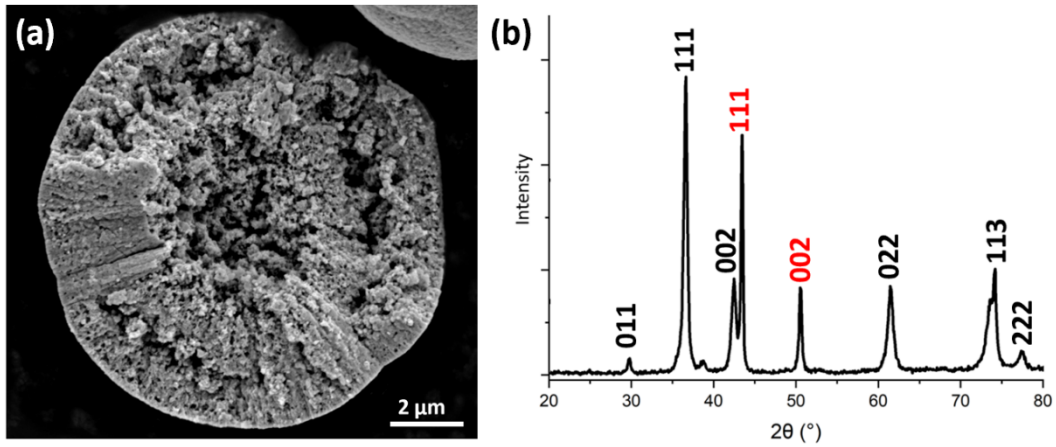


Fig. S7 (a) SEM image of a Cu/PVP spherical particle from 96 h sample. The structure is still spherical while the radial interior with needle-like submicron rods no longer exists. (b) XRD pattern of 96 h sample. Indices marked in black are from cubic Cu_2O while indices marked bright red are from cubic Cu.