

Electronic Supplementary Information

Refinement of Nanoporous Copper by Dealloying AlCu Alloy in NaOH Solution
Containing Sodium Dodecyl Sulfate

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Figure. S1

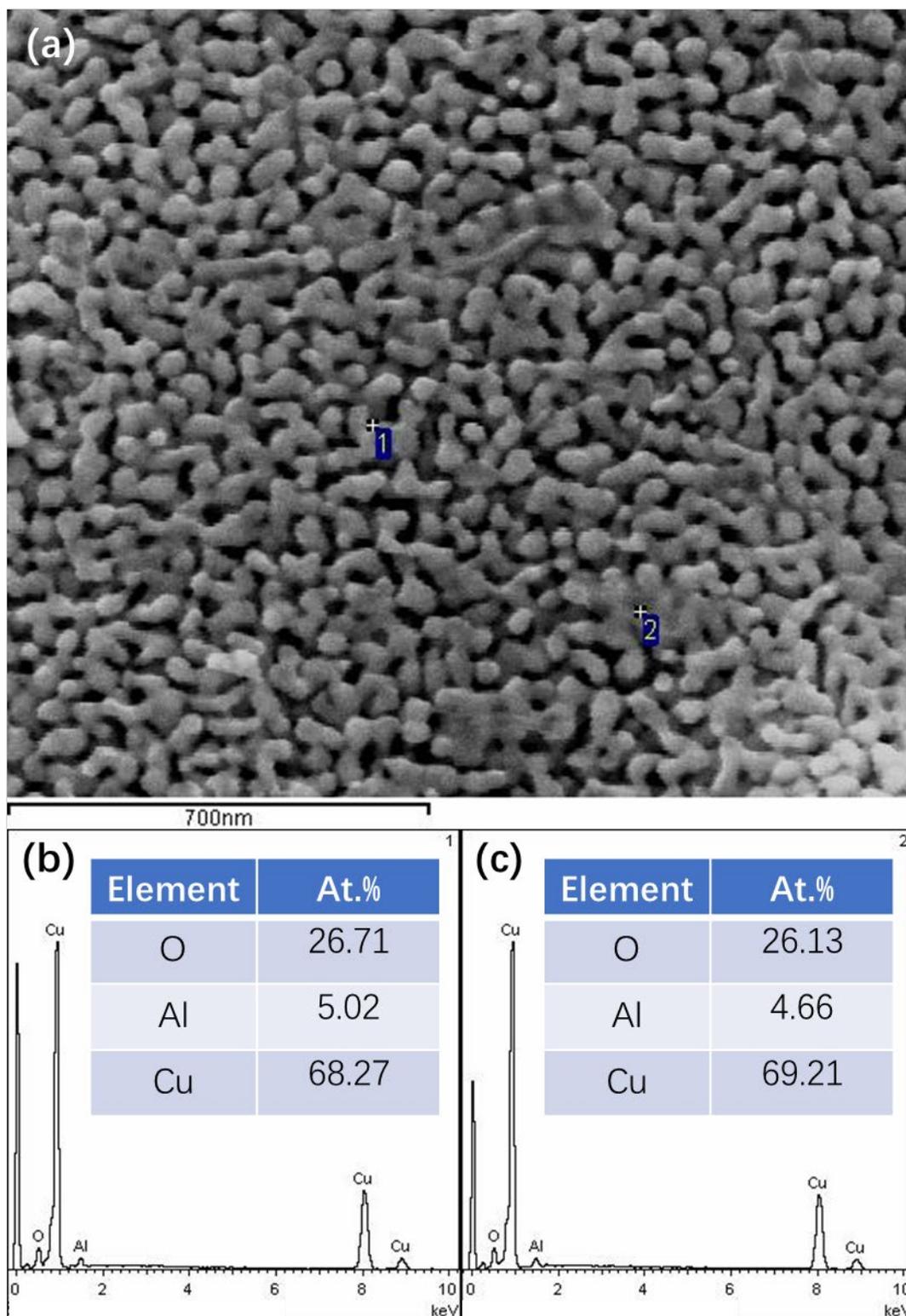


Figure. S1. (a) Typical SEM image of the sample obtained from dealloying solution containing 0.5 mM SDS. (b) and (c) present the EDS spectrums and the element content on the ligament (spot 1 in (a)) and adhesion area (spot 2 in (a)), respectively. Al signal might come from the Al sample holder or the residual Al in the dealloyed specimen.

Figure. S2

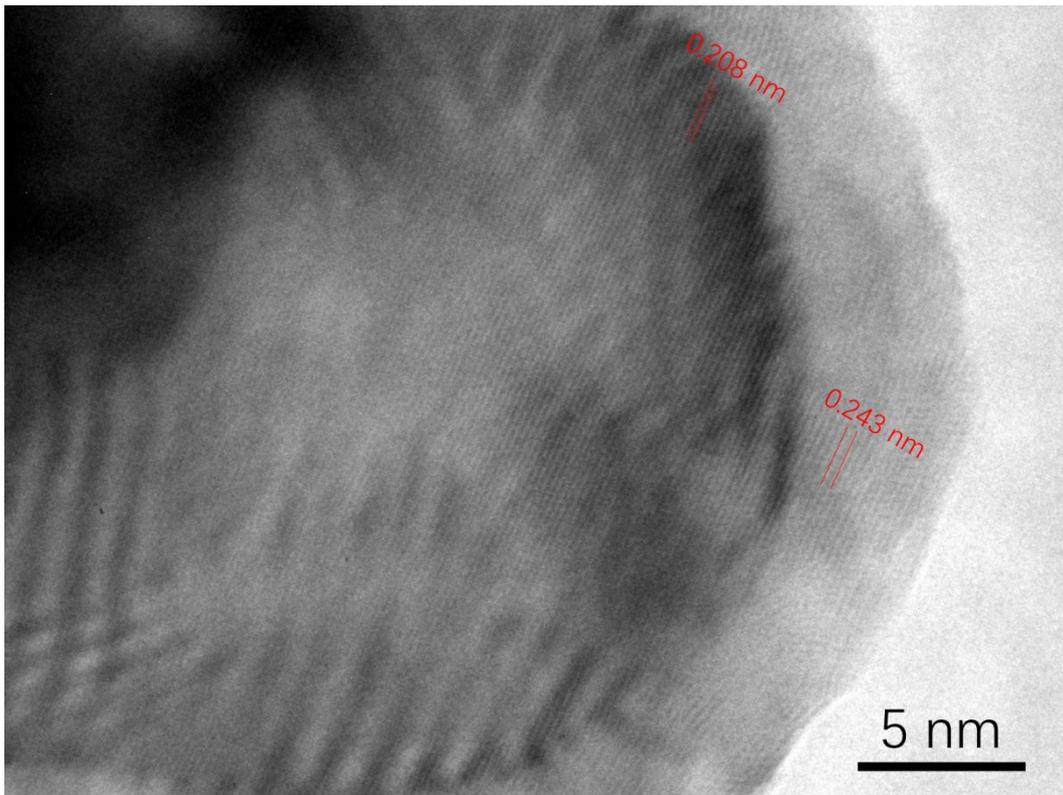


Figure. S2. HRTEM image of the region B marked in Figure. 2 in the main text. The interplanar distances of 0.208 nm and 0.243 nm are in perfect agreement with the (111) plane of Cu and (111) plane of Cu_2O , respectively.

Figure. S3

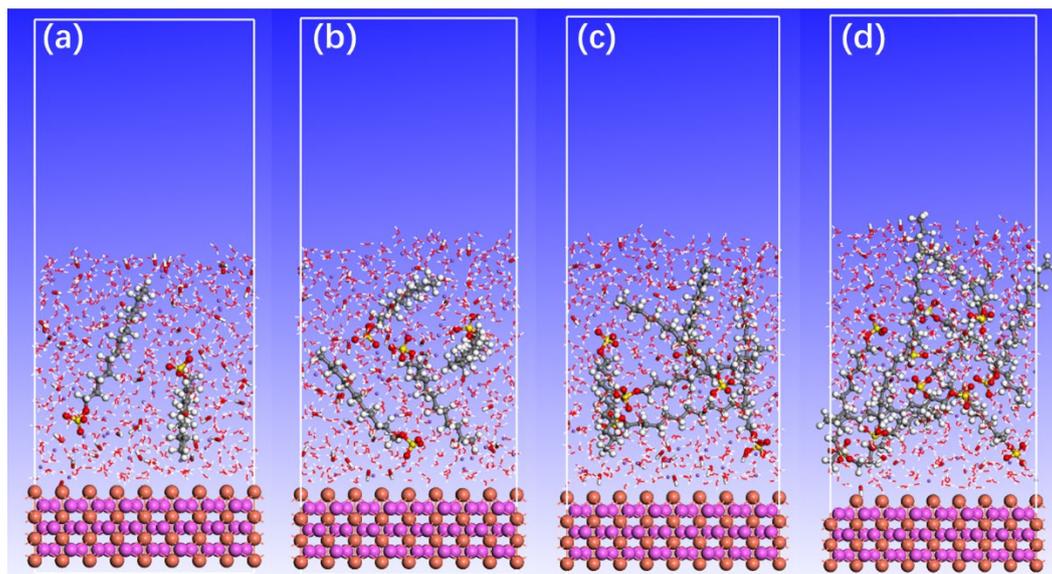


Figure. S3. Configurations of solution-alloy systems, respectively, containing (a) 2 SDS, (b) 4 SDS, (c) 6 SDS, and (d) 10 SDS molecules before MD calculation. The amorphous solution layers were randomly constructed by 500 H₂O, 50 OH⁻, x SDS, and (50+ x) Na⁺.

Figure. S4

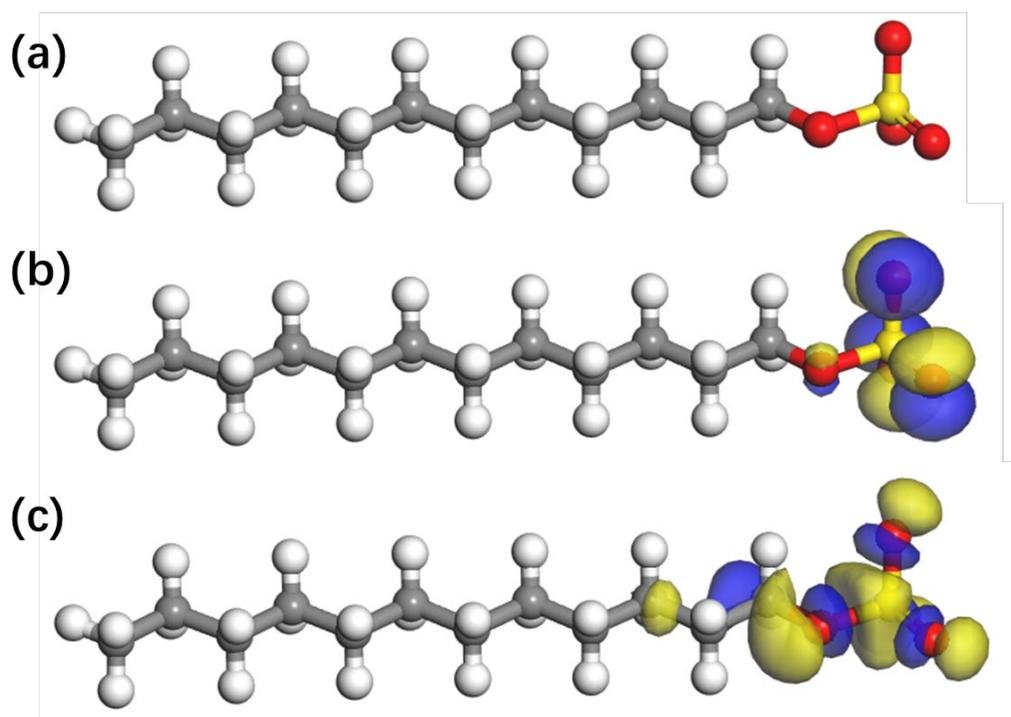


Figure. S4. (a) Optimized structure, (b) HOMO, and (c) LUMO of SDS anion.

Figure. S5

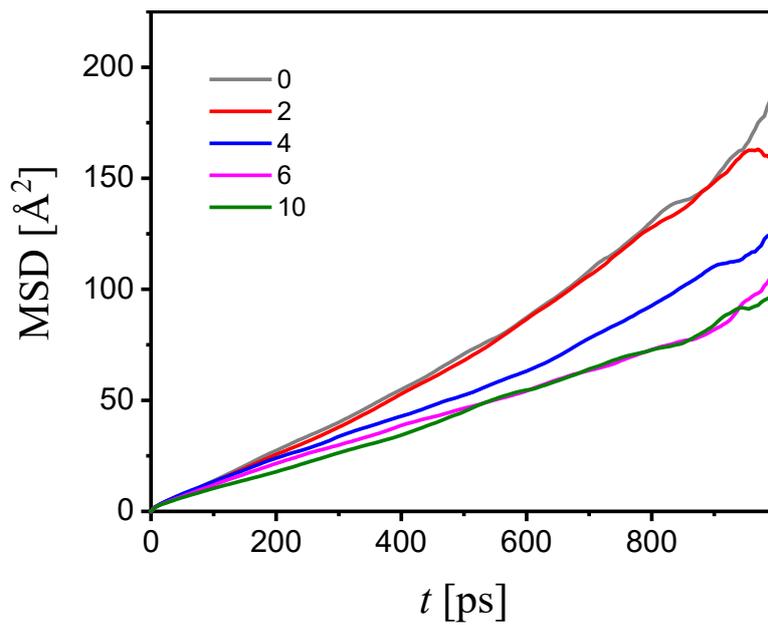


Figure. S5. Mean square displacement (MSD) curves of OH^- particles at 298 K during 1 ns MD simulation performed in the systems containing 0, 2, 4, 6, and 10 SDS molecules, respectively.

Figure. S6

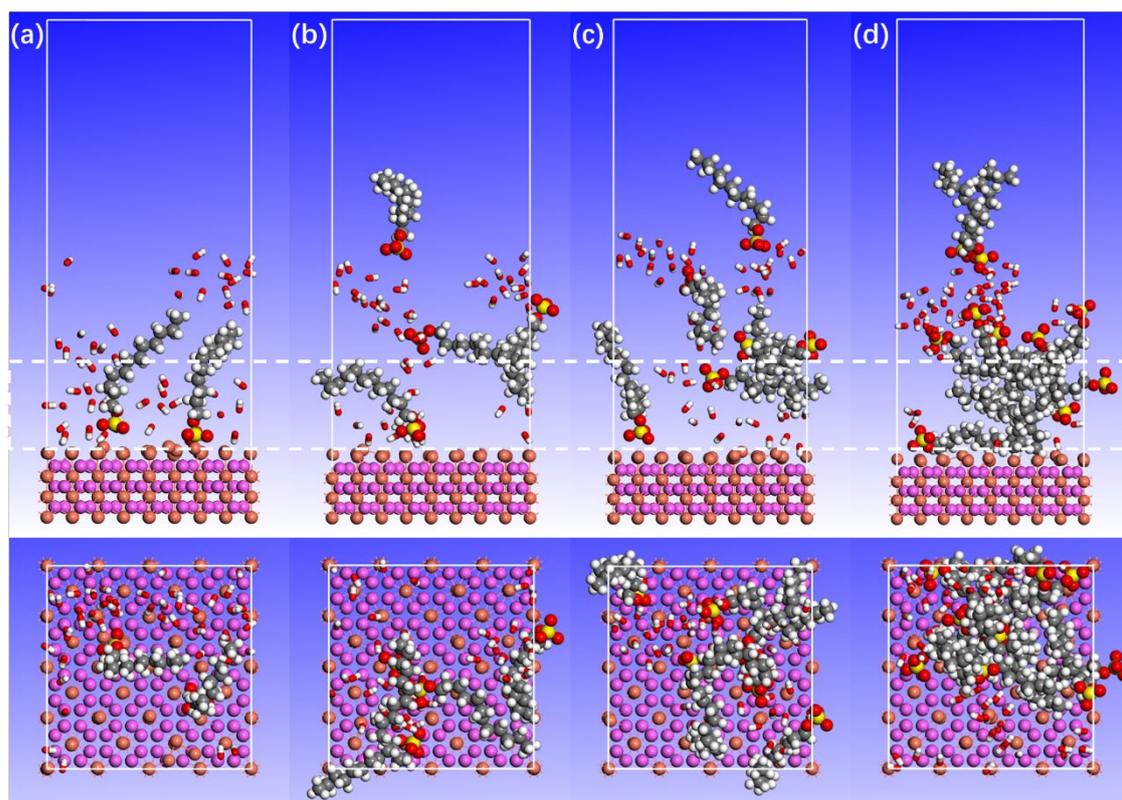


Figure. S6. Equilibrium configurations (up: side view, bottom: top view) of the systems containing (a) 2, (b) 4, (c) 6, and (d) 10 SDS molecules, respectively. The dashed rectangular shape denotes the lower part of solution layer close to the alloy surface. For clarity, H_2O and Na^+ particles are not shown. The uppermost layer contacting electrolyte are Cu atoms. The color conventions of the specimen follow those in Figure. 4 in main text.