

Supporting information to

Carbon Nanotube-Supported Cu₃N Nanocrystals as Highly Active Catalyst for Oxygen Reduction Reaction

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KEYWORDS : atomic layer deposition, copper nitride, electrochemistry, fuel cell, oxygen reduction reaction

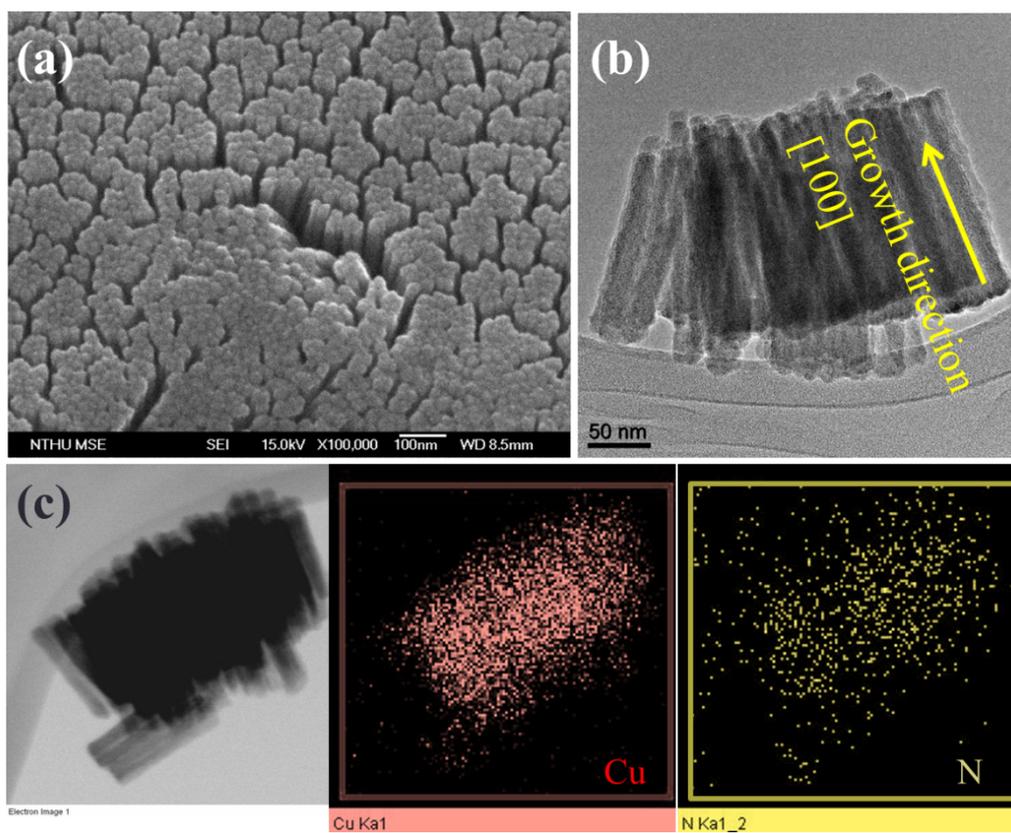


Figure S1. (a) SEM and (b) TEM images of Cu₃N nanorods grown on silicon substrate prepared by 800 cycles of ALD with ammonia gas activated plasma. (c) Elemental mappings of Cu₃N nanorods.

Element	Weight%	Atomic%
N K	6.76	24.74
Cu K	93.24	75.26

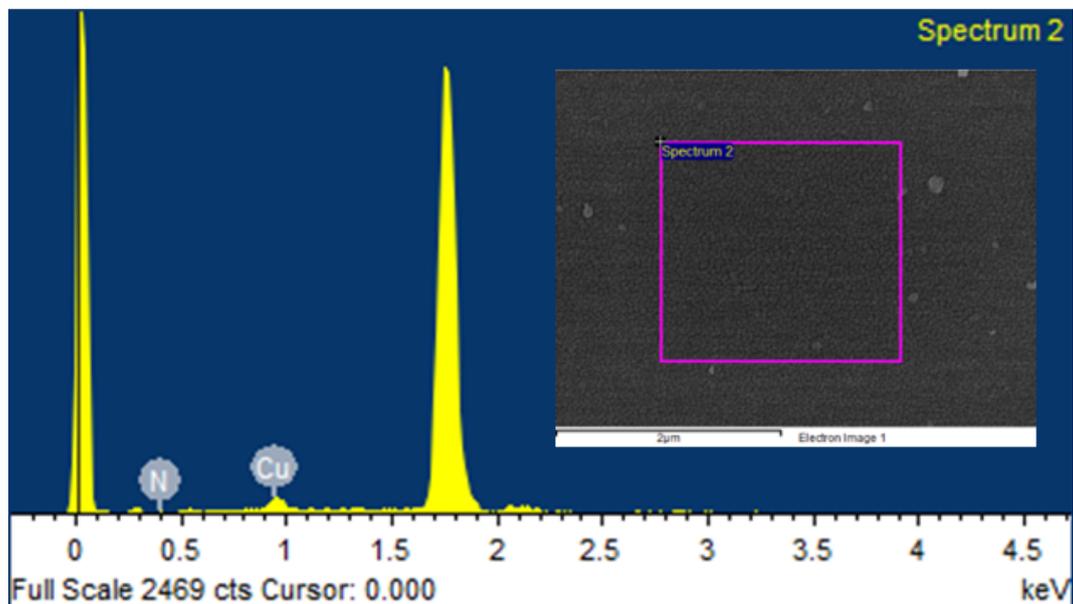


Figure S2. EDX spectrum of Cu_3N nanoparticles prepared by 400 cycles of ALD on silicon substrate.

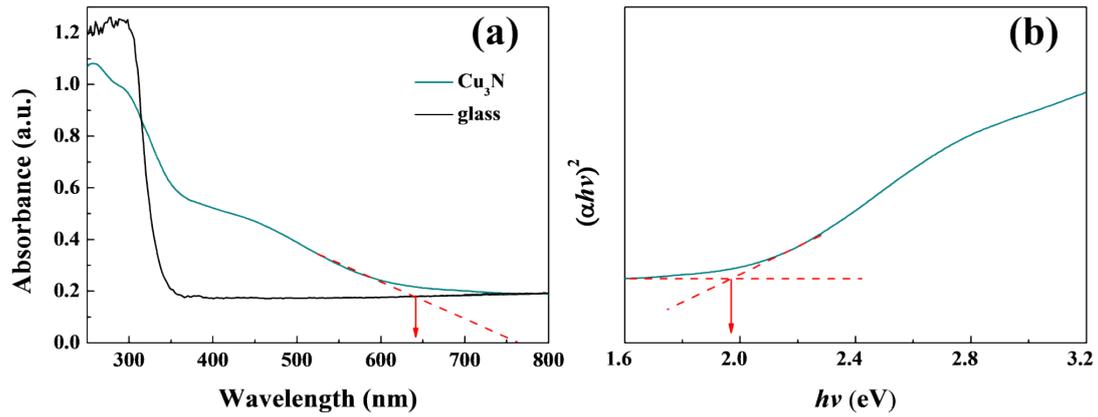


Figure S3. (a) UV-vis absorption spectrum and (b) Tauc plot of Cu₃N nanoparticles directly deposited on glass substrate by 400 cycles of ALD. E_g can be calculated from the absorbance data using the Tauc equation $ah\nu=A(h\nu- E_g)^m$, where a is the absorption coefficient, A is a constant related to the effective masses of electrons and holes, and $m =1/2$ for allowed direct transition.

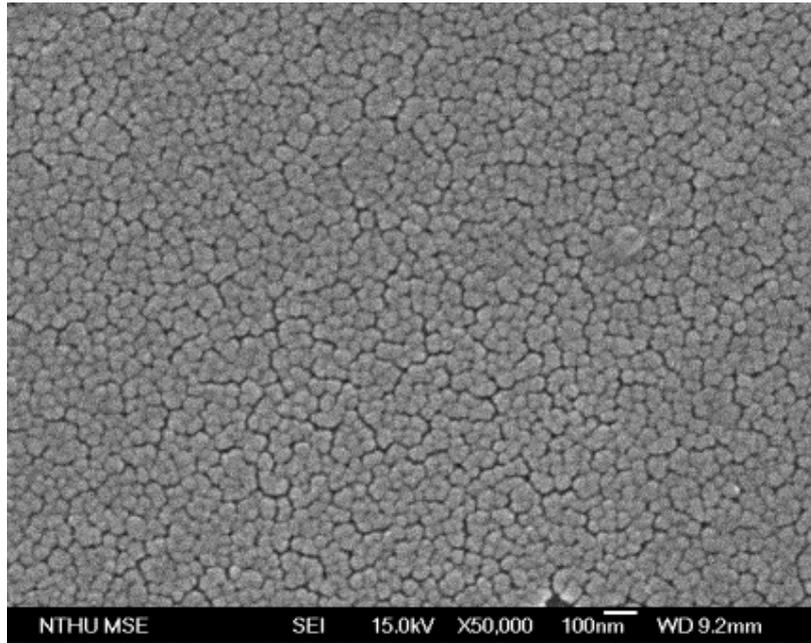


Figure S4. SEM image of Cu_3N nanoparticles grown on silicon substrate by 400 cycles of ALD.

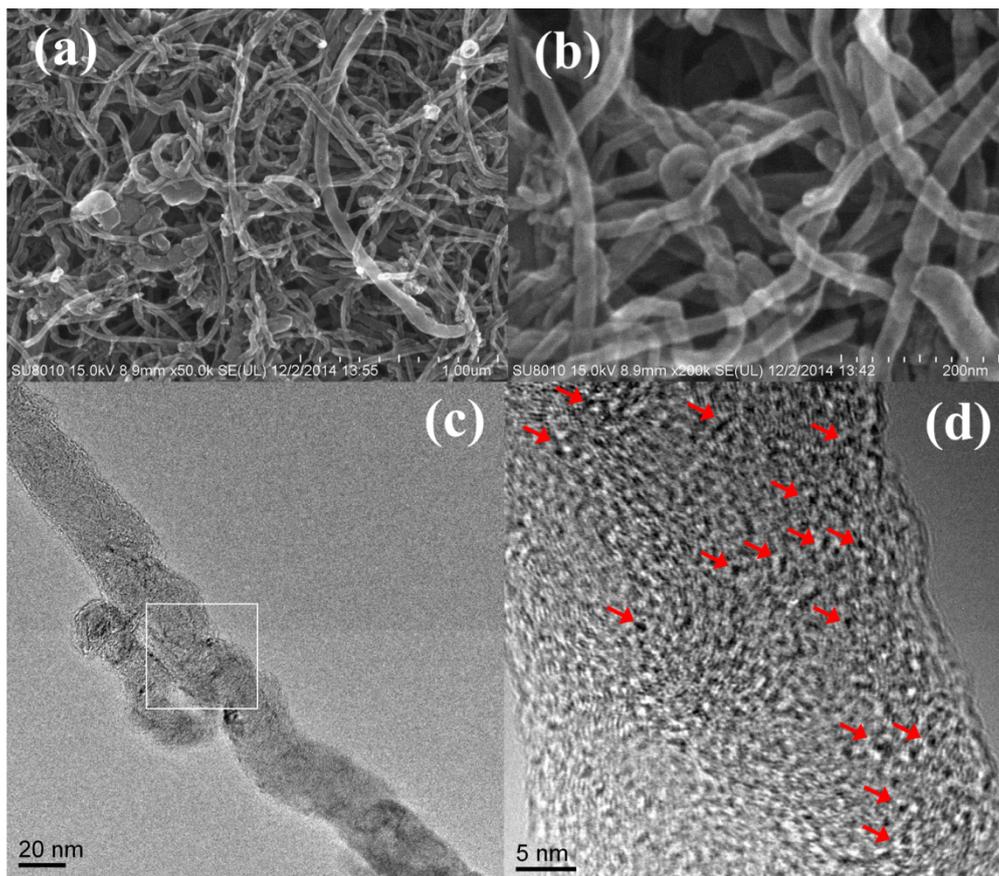


Figure S5. (a) and (b) SEM images and (c) and (d) TEM images at two magnifications of Cu₃N nanoparticles grown on acid-treated CNTs by 50 cycles of ALD.

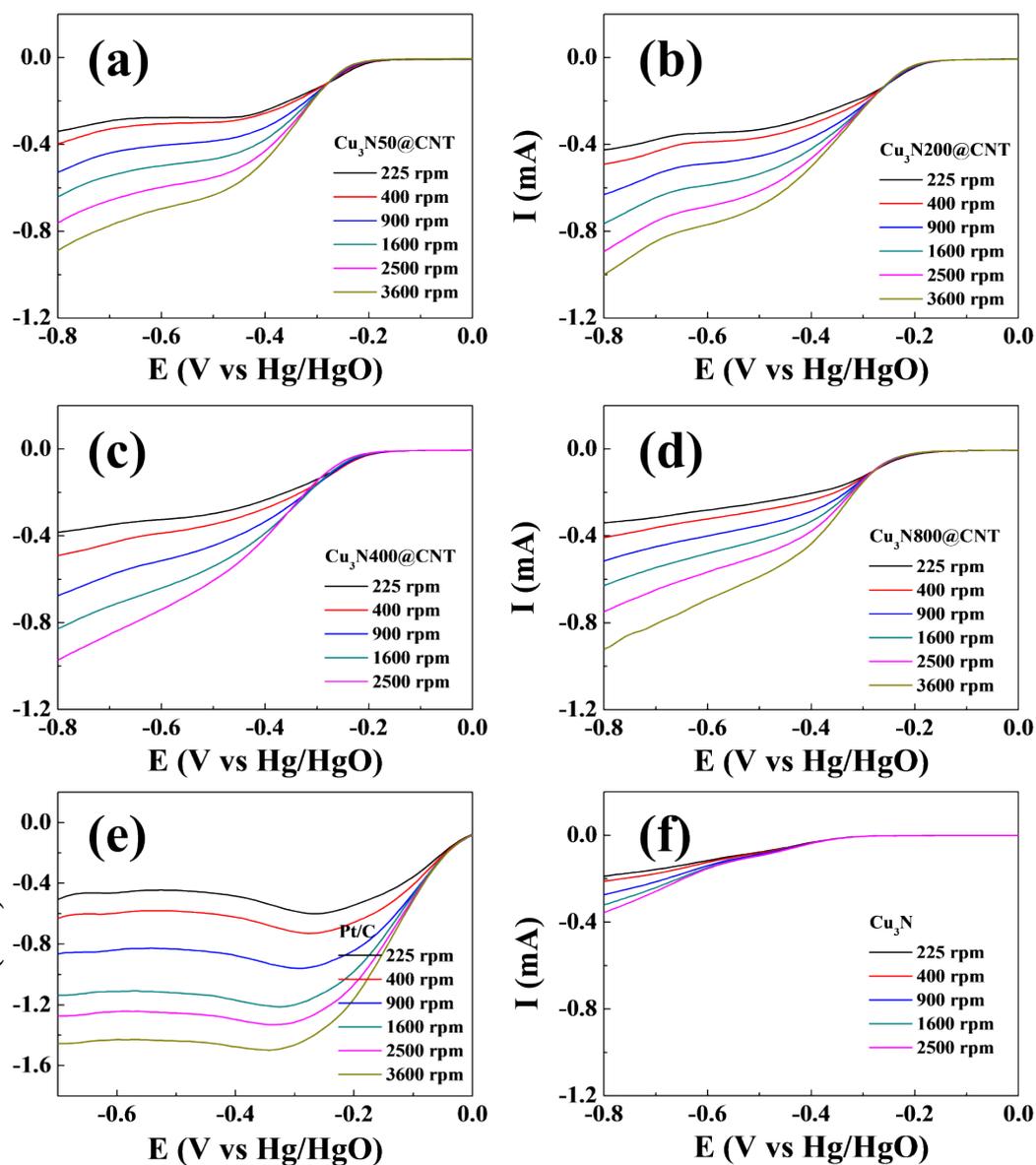


Figure S6. Rotating disk voltammograms for Cu_3N nanoparticles deposited on CNTs by (a) 50, (b) 200, (c) 400, and (d) 800 cycles of ALD in O_2 -saturated 0.1M KOH solution. The voltammograms for (e) Pt/C and (f) free Cu_3N nanoparticles are included as the references.