

**†Electronic Supplementary Information (ESI):**

**Hierarchical cupric oxide nanostructures on copper substrate for cold cathode emission: an experimental venture with theoretical correlation**

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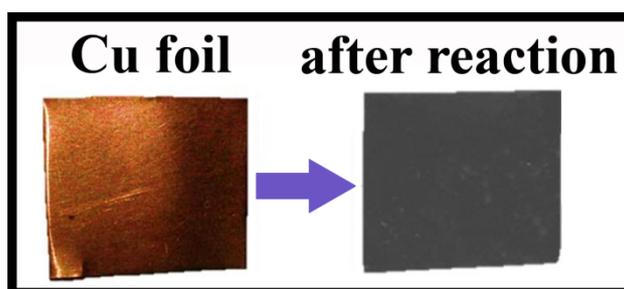
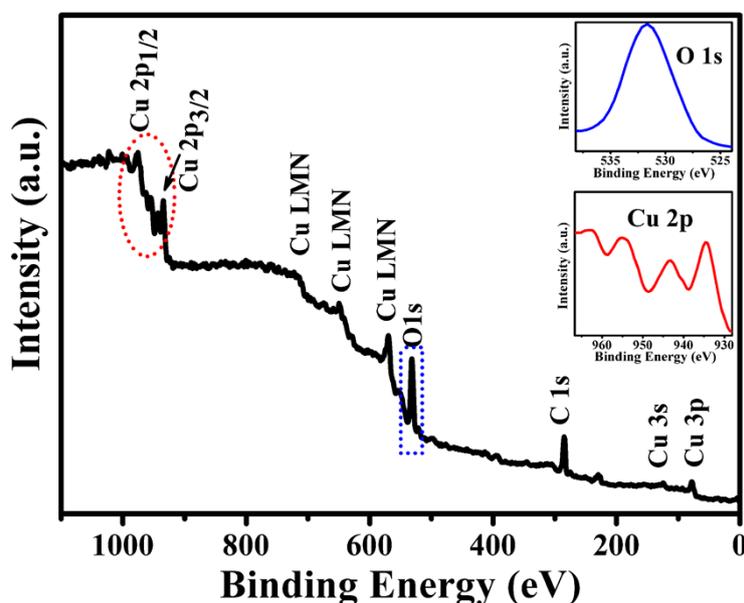


Fig. S1 showing the optical image of the copper film before the reaction and after synthesis, the Cu foil turned uniformly black, which evidences a uniform deposition of CuO all over the



substrates surface.

Fig. S2 shows the XPS survey spectra of samples P3. The peaks corresponding to Cu 3d, 3p, 3s, 2p and Auger, O 1s and Auger are obviously observed. Survey spectra strongly discard

any possibility regarding the presence of impurity agents in the synthesized nanostructures. Furthermore, the selected core level peaks of Cu 2p and O 1s has been magnified in the inset of the survey spectrum.

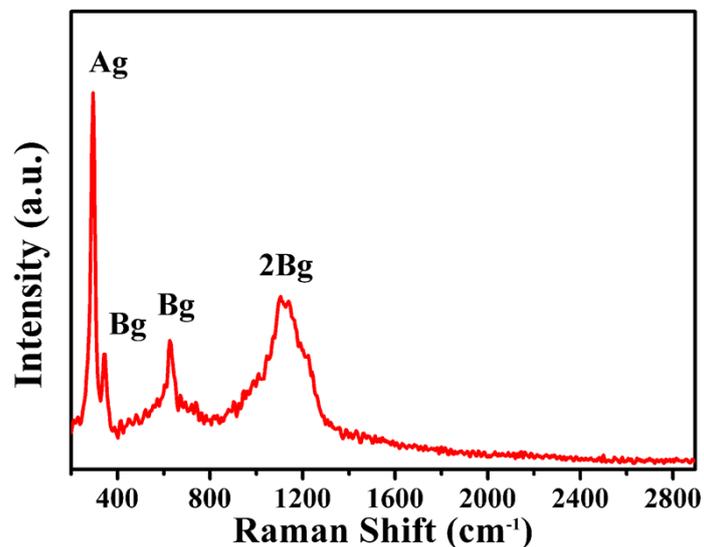


Fig. S3 shows the Raman spectra of the CuO nanostructures for the entire range of 200 – 2900 cm<sup>-1</sup>. The spectrum does not show appearance of any Raman modes of Carbon (D=1363 and G=1593 cm<sup>-1</sup>) in entire scan range which scientifically admits no appearance of carbon/ carbonate during synthesis of CuO nanostructure. Moreover the spectrum clearly specifies the uniform growth of CuO nanostructures over the entire substrate (Cu foil).

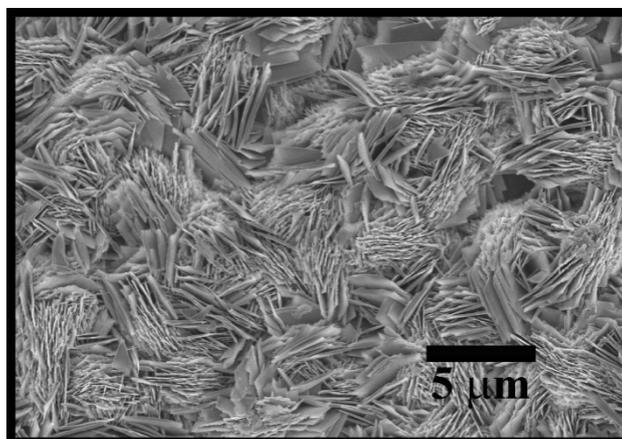


Fig. S4 showing flake like morphology of CuO without any structure regulating agent.

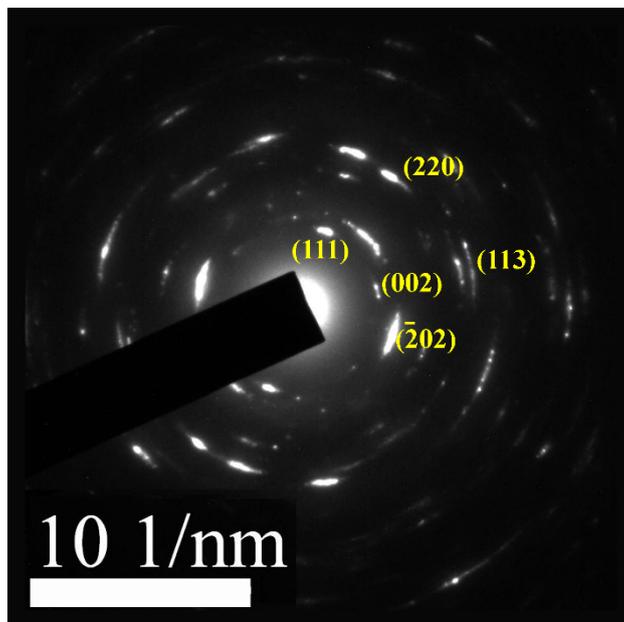


Fig. S5 is showing the typical SAED pattern of individual nanoneedle (sample P3) of CuO nanostructures