# rGO coated CuO nanowires on 3D copper foam and its improved field emission properties

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Abstract

CuO nanowires (NWs) were directly grown by wet chemical method on 3D Cu foam, followed by the deposition of graphene oxide (GO) on them by dip coating technique. GO, coated on CuO NWs, was reduced to graphene oxide (rGO) by a thermal annealing process. In a set of different samples, Cu NWs were synthesized by the thermal reduction of CuO NWs, which were further coated by GO and rGO. The field emission studies of CuO NWs, Cu NWs, GO/CuO, GO/Cu, rGO/CuO, and rGO/Cu nanocomposites have been performed. The basic idea behind the use of Cu foam was to increase the emitter density because the high specific surface area of Cu foam, due to its porous nature, can accommodate more CuO NWs. The enhanced field emission results for GO/CuO, GO/Cu, rGO/CuO, and rGO/Cu nanocomposites were due to sharp surface protrusions of GO and rGO sheets. Local field enhancement at the apex of sharp protrusions allows the tunneling and hence emission of electrons through tips at considerable lower threshold voltage.

References

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Figures

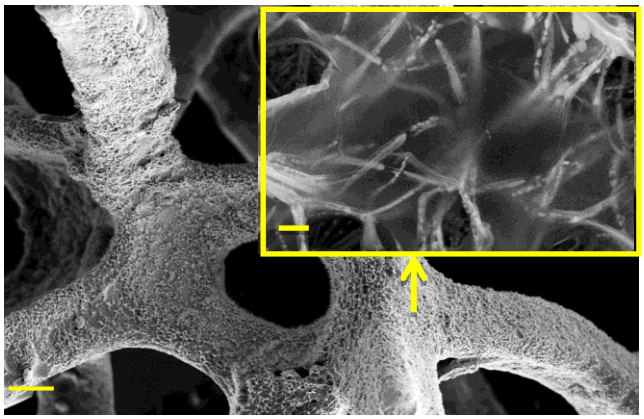

**Figure 1:** FESEM image of GO deposited on Cu NWs which were grown on 3D Cu foam. Inset is the enlarged view. Scale bar length is 1µm and inset scale bar length is 400 nm.