

Additive Manufacturing as a Means of Gas Sensor Development for Battery Health Monitoring

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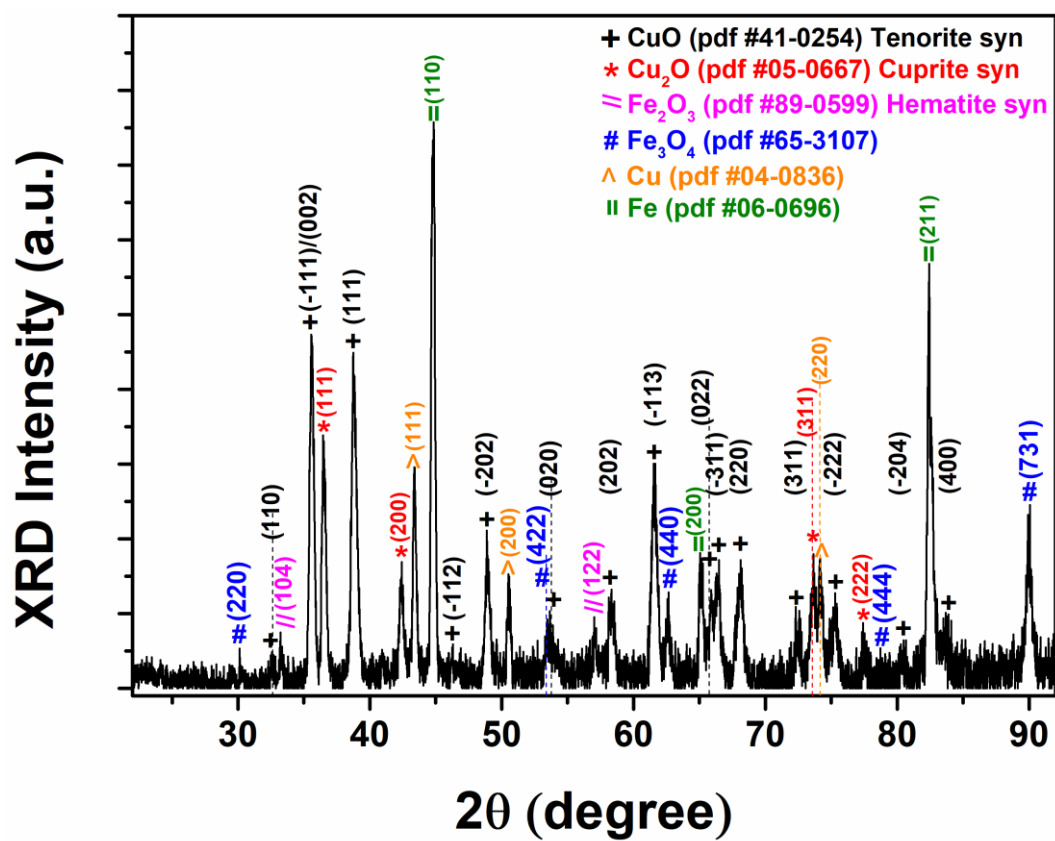


Figure S1. XRD diffractograms of the 3D printed copper and iron oxide heterostructure.

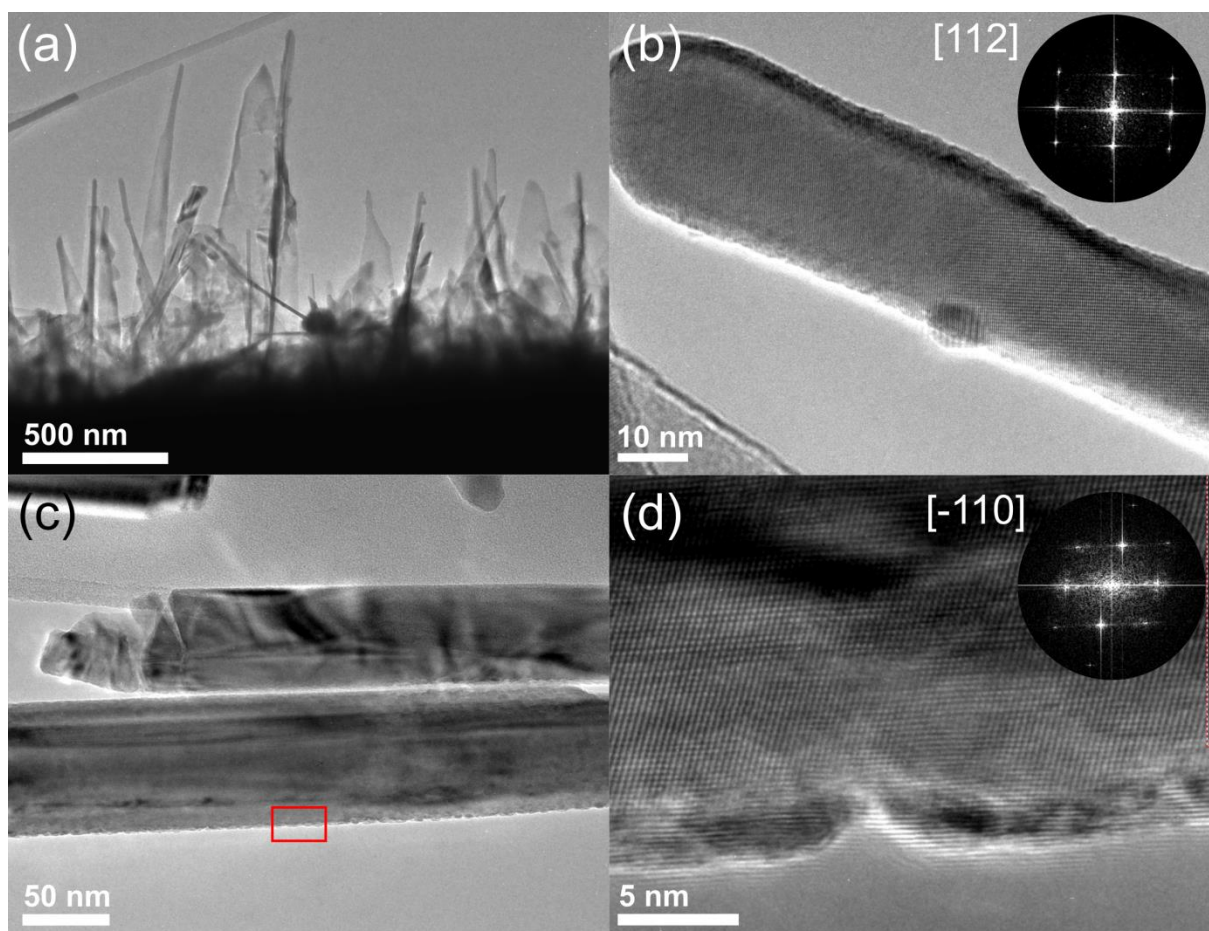


Figure S2. (a) TEM bright field micrograph of various iron oxide nanowires and nanospikes. (b) HRTEM micrograph of a single iron oxide nanowire with a diameter of 25nm. FFT (inset) shows that the wire is fully crystalline Fe_3O_4 oriented in ZA [112]. (c) shows two CuO nanowires with diameters of 65 and 80 nm respectively. (d) HRTEM and subsequent FFT (inset) of the area marked in (c) show that the CuO nanowires possess monoclinic CuO crystal structure with the lower wire being oriented along ZA [-110].

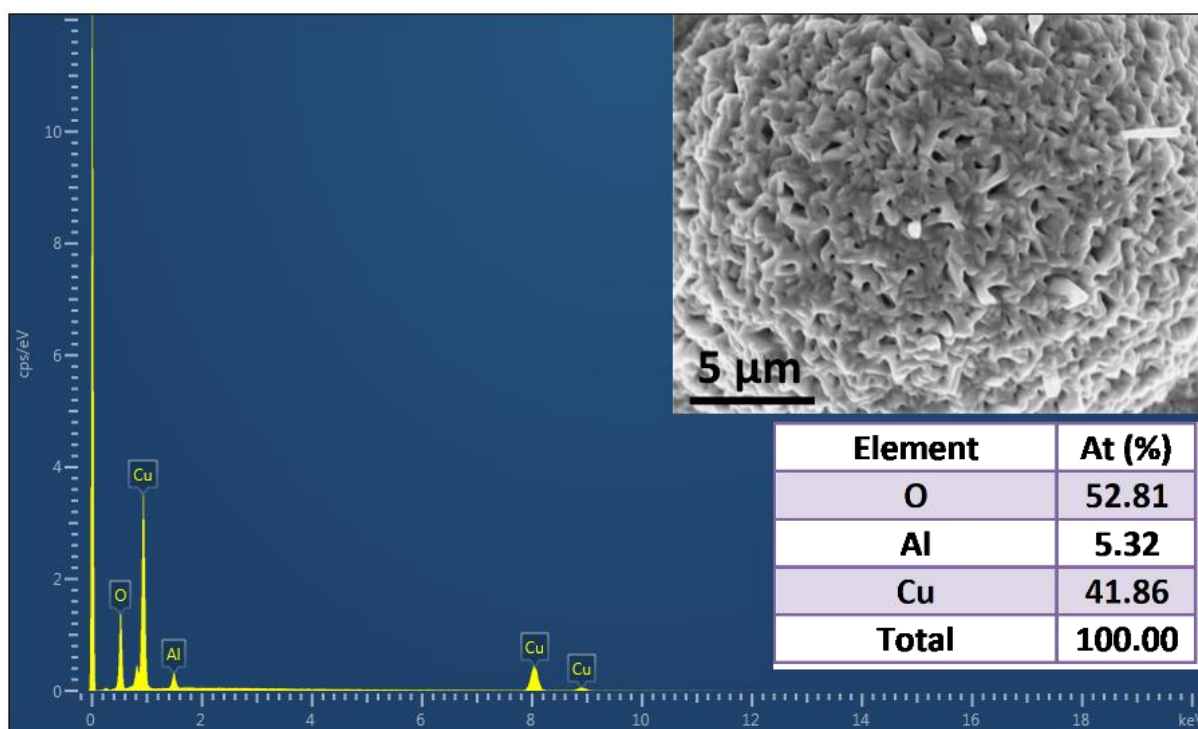


Figure S3. EDX spectrum with the elemental composition of the $\text{Al}_2\text{O}_3/\text{CuO}$ -3D samples. Inset shows SEM image of the respective sample and region where spectrum was measured.

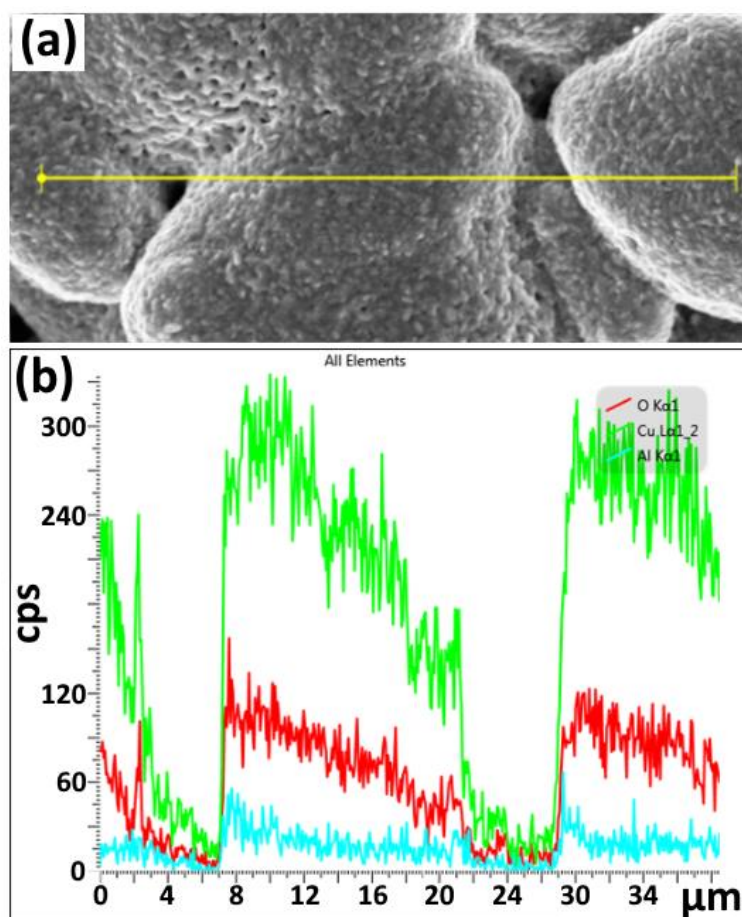


Figure S4. (a) SEM image and (b) EDX-line scan profile of Cu, O and Al taken along the three microparticles of CuO covered with a thin layer of Al_2O_3 .