Electronic Supplementary Material (ESI) for RSC Advances.

Influence of Mn incorporation on supercapacitive properties of hybrid CuO/$Cu(OH)_2$ electrodes

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Supporting information S1

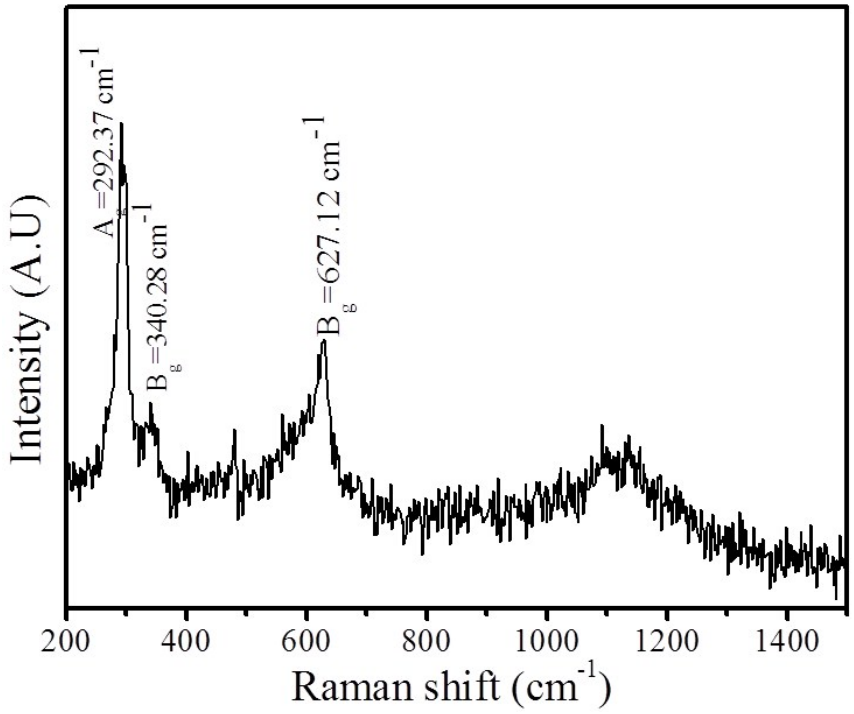

Figure S1 Raman spectrum of CuO sample deposited at room temperature on stainless steel.

Figure S1 shows, the Raman spectrum of CuO sample deposited at room temperature on stainless steel, as CuO is a material with semiconducting properties that crystallizes in a monoclinic structure with space group symmetry of C^6_{2h}; the here study was performed to confirm the crystal structure of CuO nanostructures. The primitive cell contains two molecular units and thus there are 12 vibrational modes at the zone center including three acoustic modes (Au+2Bu), six infrared active modes ($3A_u+3B_u$) and three Raman active modes ($A_g+ 2B_g$). These normal lattice vibrations at the Γ-point of the Brillouin zone are given on the basis of group theory by the equation: $\Gamma = 4Au+ 5Bu+ A_g+ 2B_g$. Because of the site symmetry only oxygen atom displacements give to the Raman modes and thus the Cu atoms are stationary for these three modes. The bands are found at 292.88, and 340, 627.12 cm^{-1}. The former peak at 292.88

cm^{-1} belongs to A_g whereas two latter peaks at 340 and 627.12 cm^{-1} are assigned to B_g modes of CuO, respectively, which are in good agreement with the previously reported record.

Supporting information S2

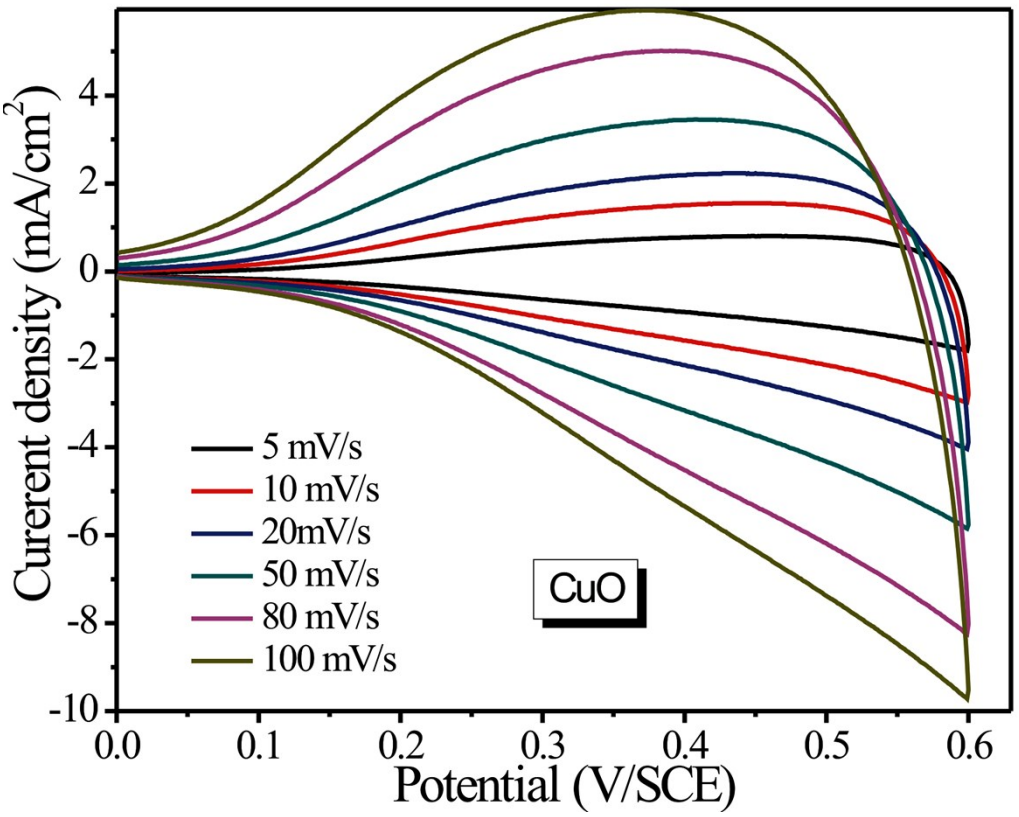

Fig. S2 Cyclic voltammograms of pure CuO/$Cu(OH)_2$ electrodes at 5-100 mV s^{-1} scan rate.

Supporting information S3

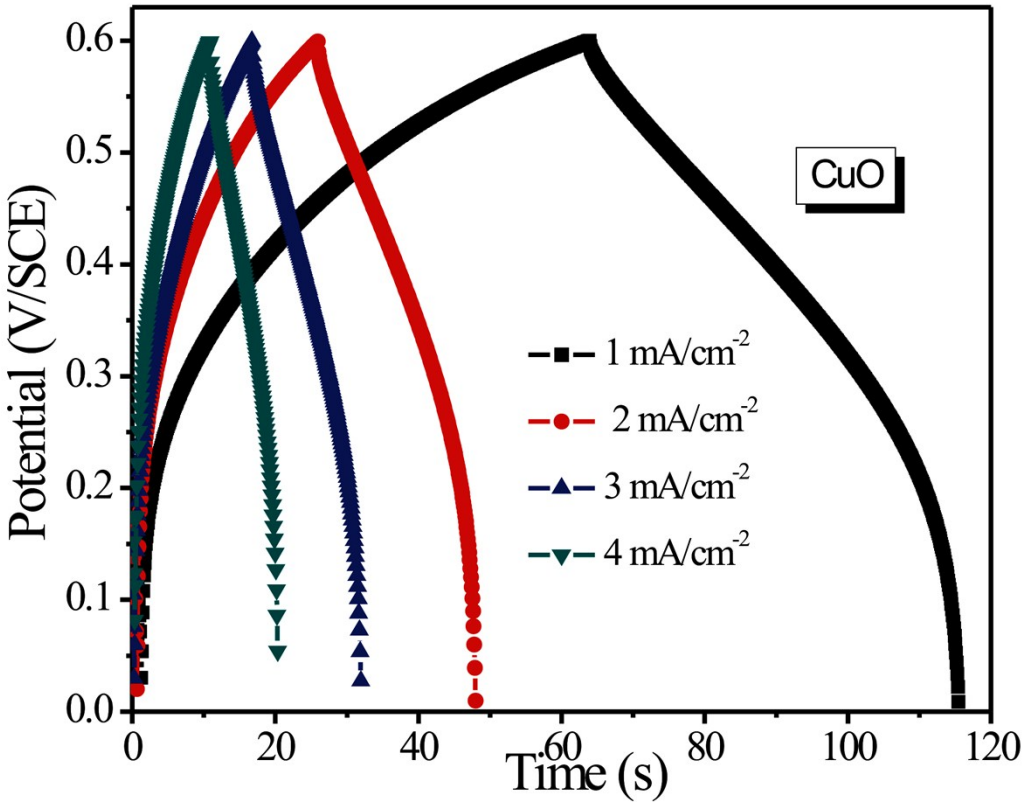

Fig. S3 Galvanostatic charge/discharge curves pure CuO/$Cu(OH)_2$ sample at current densities.