**Supplementary Material**

**Electrochemical detection of natural organic matter (humic acid) and splitting of H2O2 on a micro-pore 3D catalytic polysulfone-copper oxide nanocomposite surface**

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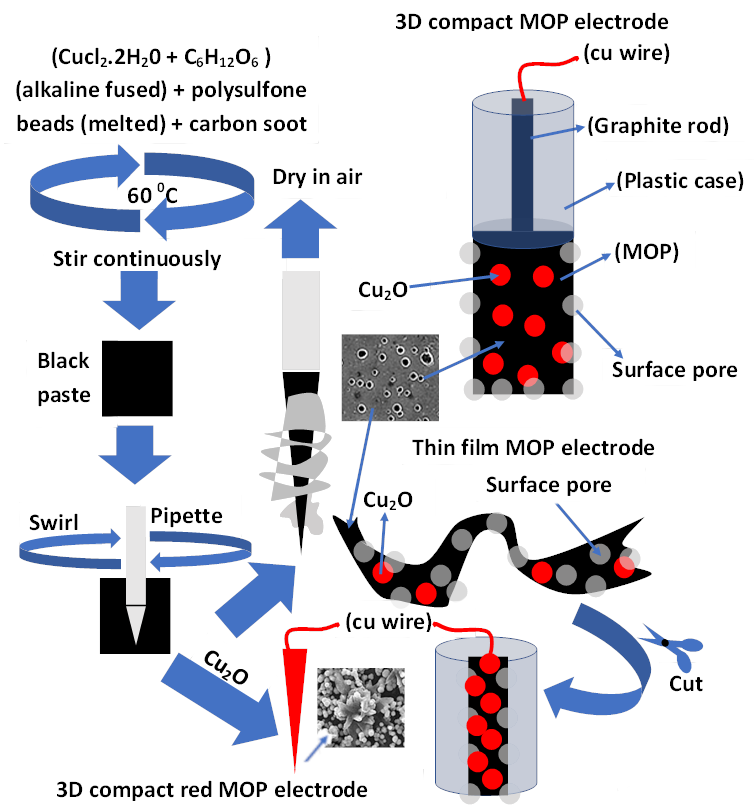
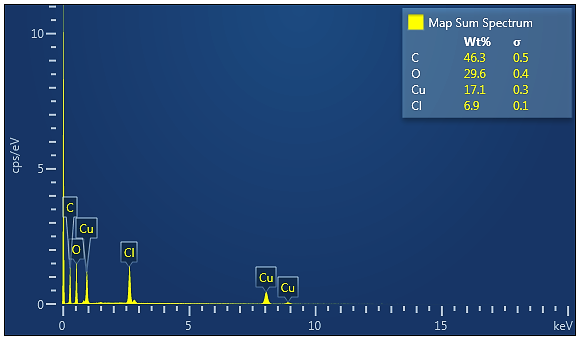


Fig. S1. Fabrication of Cu2O(Cl)-polysulfone-carbon soot metalloplastic electrodes.

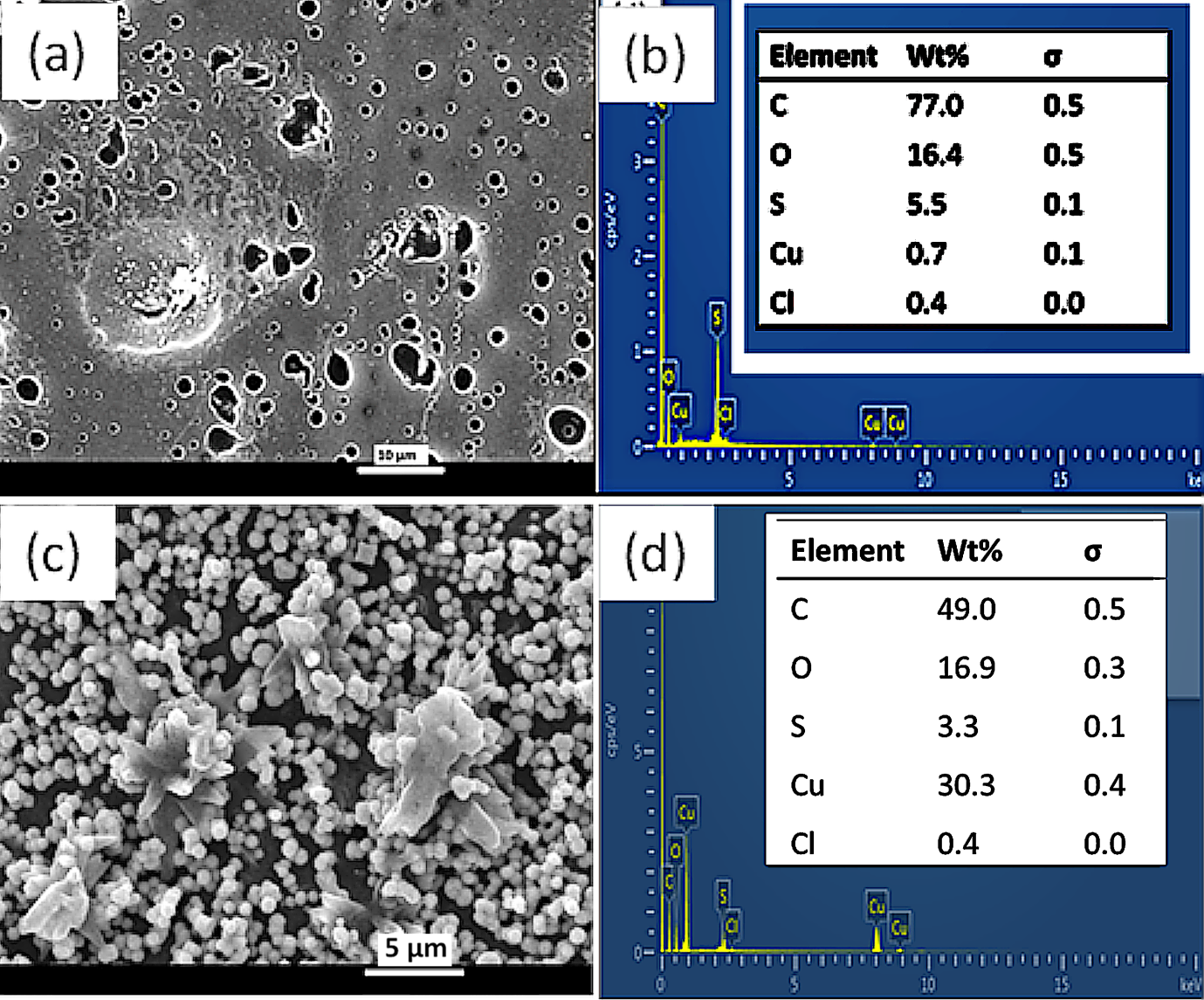
**(i)**



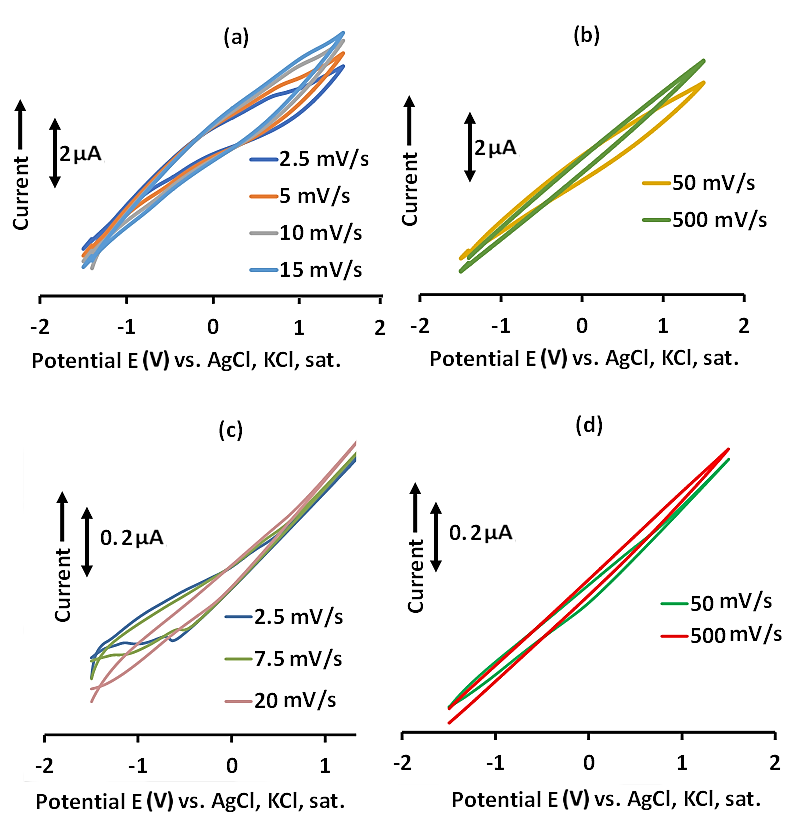
**(a)**

**(b)**

**Figure S2.** Characterization of the copper clusters in alkaline glucose matrix before composite formationwith polysulfone and carbon soot. **(a)** SEM image; (b) EDS image.



**Figure S3.** Comparative SEM and corresponding EDX images of the black and red MOP materials. (a-b) Black MOP material; (c-d) Red MOP material.

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**Figure S4.** Variation of current vs. potential at different scan rates. (a-b) compact MOP electrode; (c-d) Thin-film MOP electrode.

**Table S1.** Comparison of the sensing behaviour of the MOP composite with some literature works

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Method | LOD (mg/L) | Range (mg/L) | R2 | Reference |
| FIA-Diode Array  Detection | 9.18 | 0-2000 | 0.9988 | [1] |
| Chemiluminescence | 1 x10-2 | 0.03-10 | 0.9920 | [2] |
| Fluorescence | 4 x 10-1 | 0 – 8 | 0.9972 | [3] |
| UV-Vis Spectrophotometry | 1.58 x 10-2 | 0.0 - 0.41 | 0.9971 | [4] |
| UV-Vis Spectrophotometry | 4.6 × 10−5 | 0–0.00047 | 0.9979 | [5] |
| MOP -Compacta | 1.584 x 10-6 | 1.90-8.0 x 10-4b | 1.0000 | This work |
| MOP –Thin-filma | 1.04 x 10-13 | 17-153c | 1.0000 | This work |

aMOP = Metalloplastic;b@ +0.35 V;c@-1.0 V.

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