Exploring a GE/Nafion/Co-MOF nanosheets/CuO NPs/GOx powered electrochemical biosensor for ultrasensitive detection of Rebaudioside A

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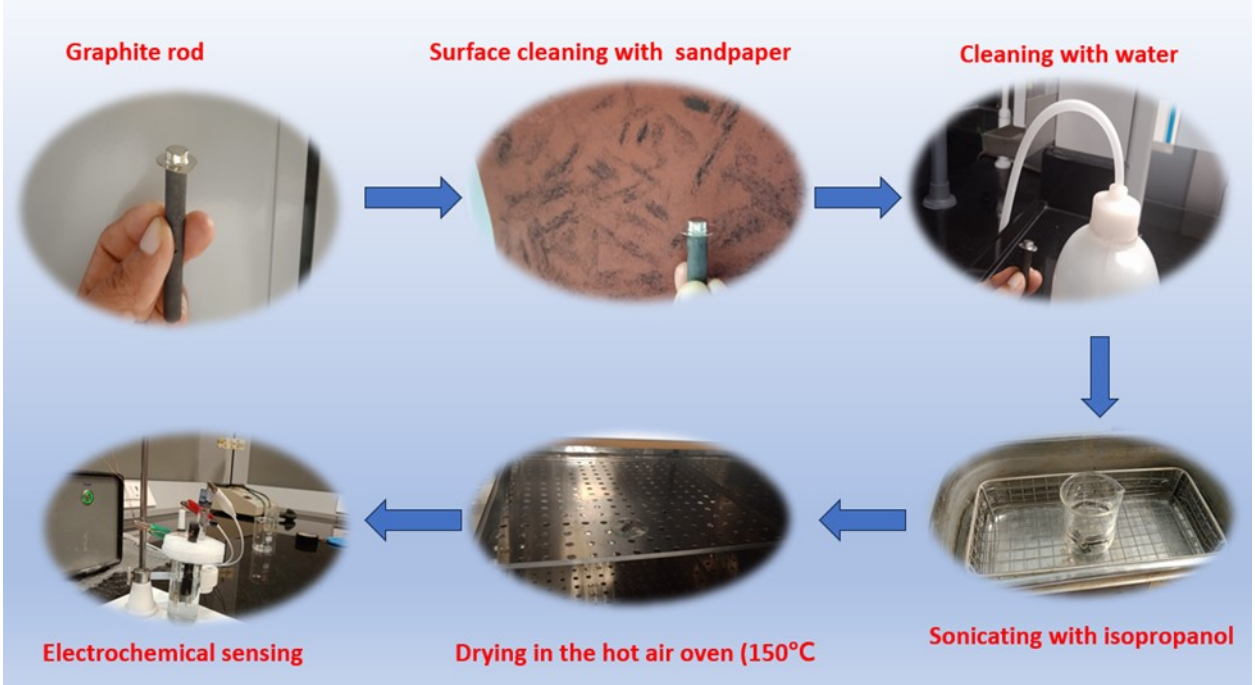
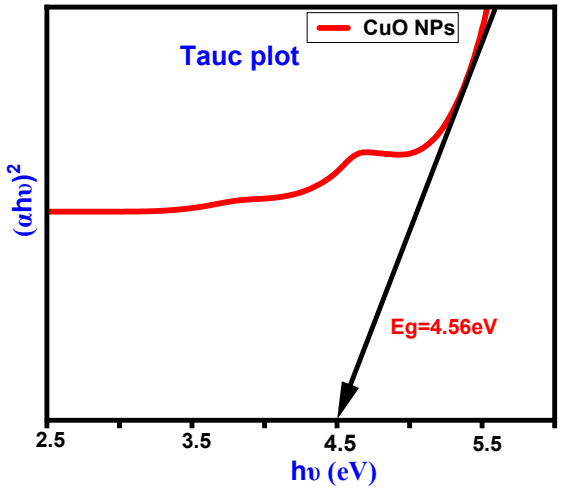
1. Extraction of Graphite Rod from the Discharged Batteries

S.1 . Illustration of the safe dismantling of a graphite rod from batteries.



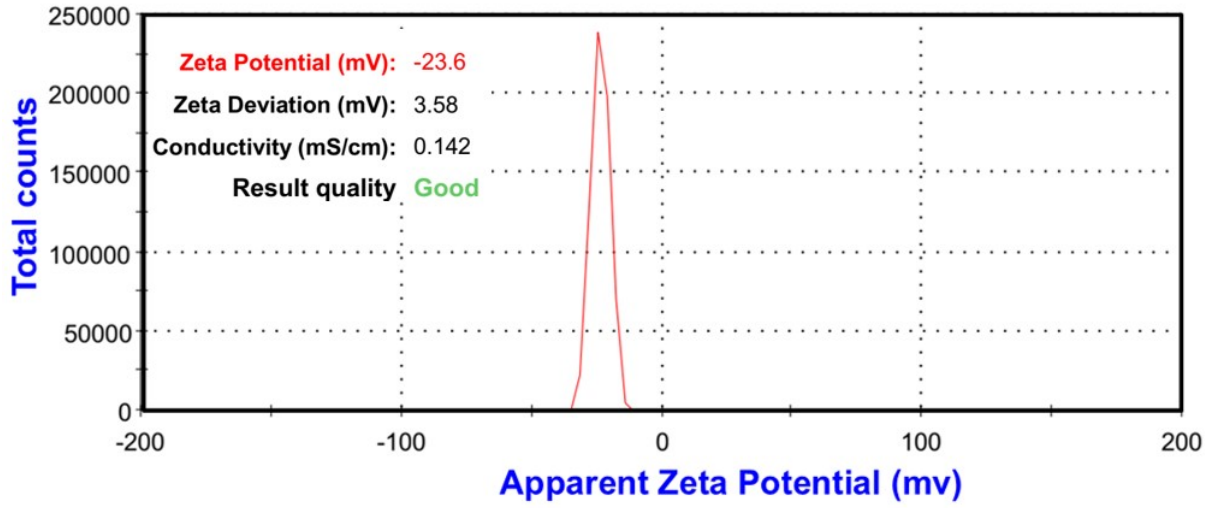
S.2 Schematic representation of the cleaning process of the recovered graphite rod

2. UV -Visible spectroscopy



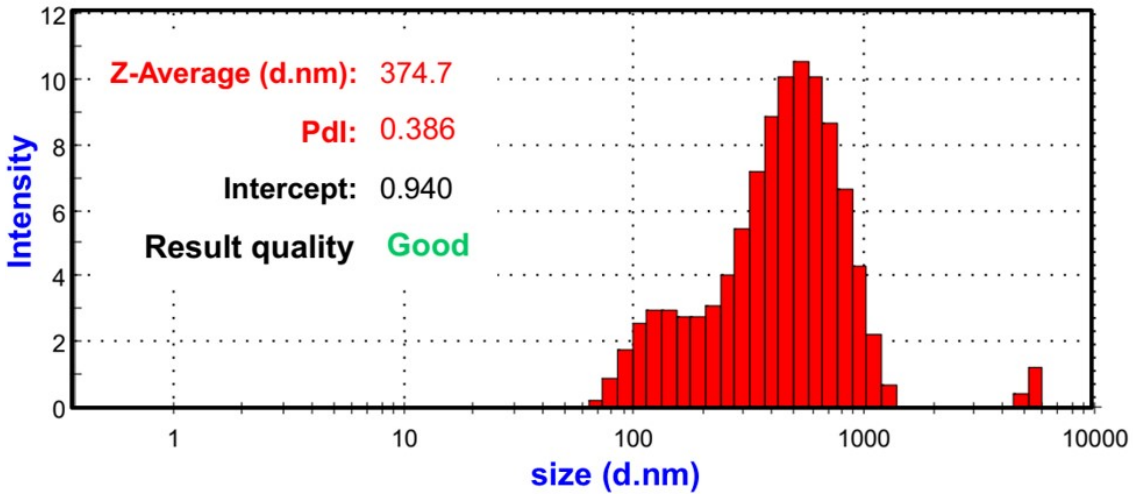
S.3. Tauc plot of the biosynthesized CuO NPs

2. Zeta potential analysis of CuO NPs



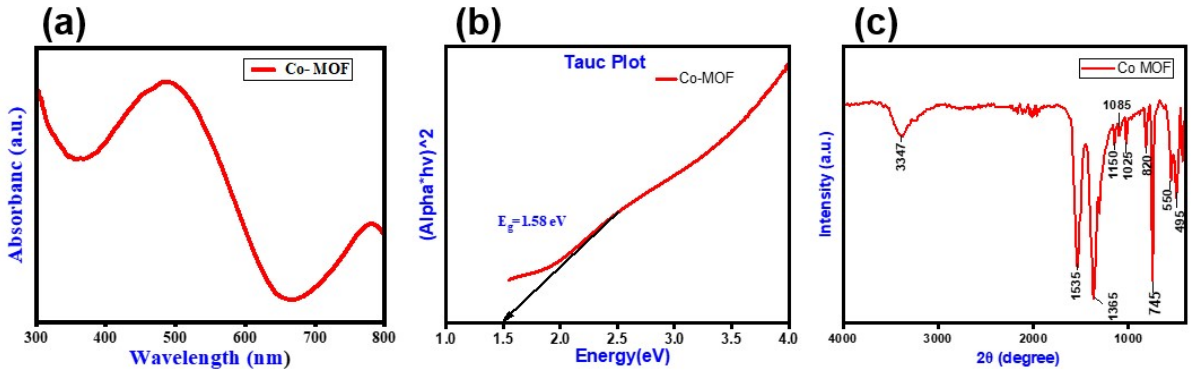
S.4. Zeta potential analysis of biosynthesised CuO NPs

3. DLS Particle Size Analysis



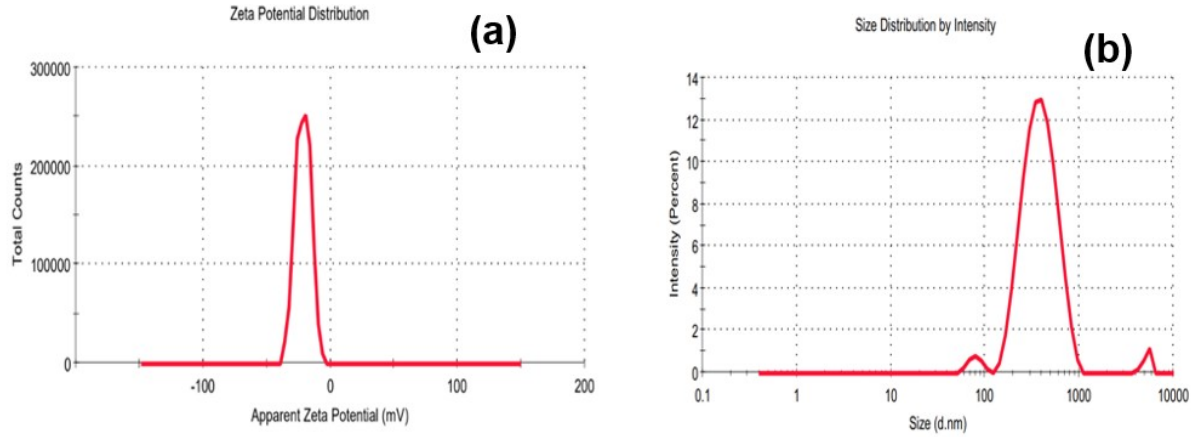
S.5. Particle Size analysis of biosynthesized CuO NPs

4. Spectroscopic Analysis of Co-MOF



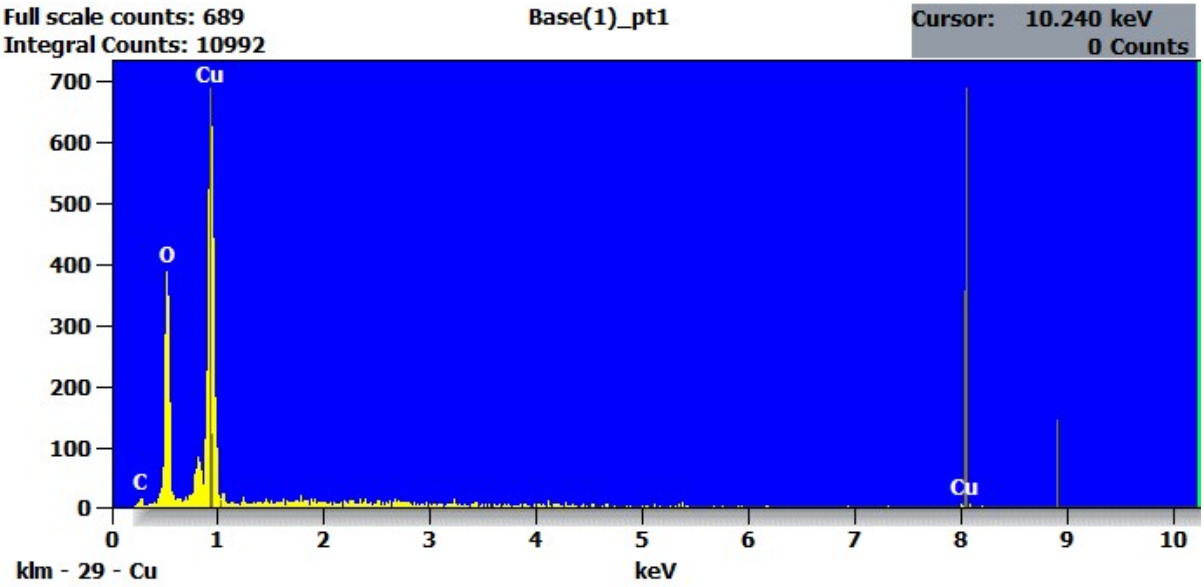
S.6. (a) UV-Vis analysis of Co-MOF;(b) Tauc plot of Co-MOF; (c) FTIR spectroscopy of Co-

MOF.

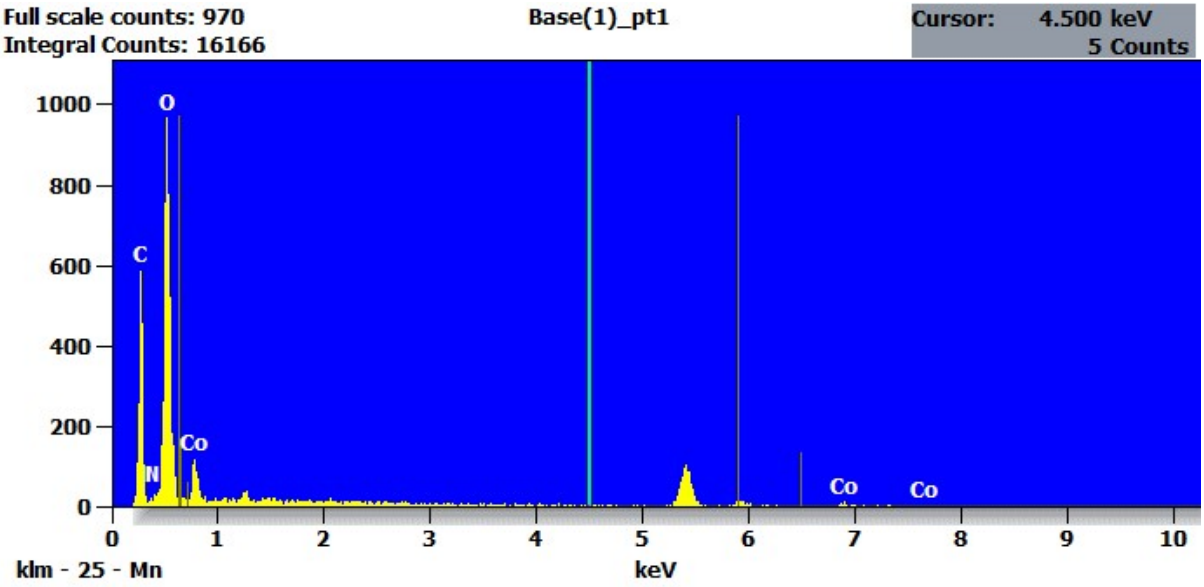


S.7. (a) Zeta Potential of Co-MOF; (b) DLS analysis of Co-MOF

5. Energy-Dispersive X-ray Spectroscopy

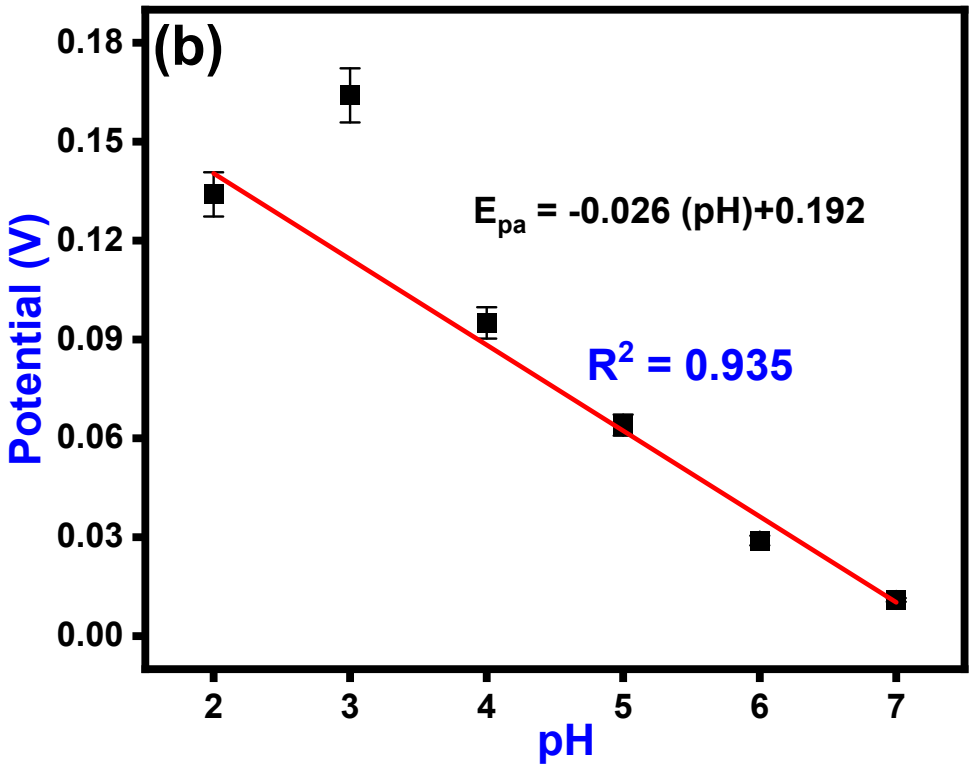


S.6 EDS Analysis of CuO NPs



S.7 EDS Analysis of Co-MOF

6. Method Optimization



S.8 pH Vs. potential

Supplementary Table 1: Comparison of the present electrochemical biosensor with reported sensors from the literature.

Glycoside	Method	Stability/ Precision	Linear Range	LOD	Ref.
Rebaudioside A	Electrochemical Biosensor (GCE)	Good (stable signal)	0.001–0.05 mM & 0.075–1.25 mM	0.264 µM	[1]
Steviol Glycosides	Electrochemical Immunisensor (GCE)	Stable signal	0.1996 mg/L to 1.5748 mg/L	0.6346 mg/L.	[2]
Rebaudioside A	HPLC-UV (RP-HPLC)	RSD <2%	0.0005–1.5 mg/mL	0.01 mg/mL	[3]
Stevioside	UHPLC-ESI-MS/MS	RSD 1.1–9.3%	0.2–1.0 mg/L	0.003–0.078 µg/g	[4]
Rebaudioside D	UHPLC-ESI-MS/MS	RSD 1.1–9.3%	0.2–1.0 mg/L	0.003–0.078 µg/g	[5]
Rebaudioside M	UHPLC-ESI-MS/MS	RSD 1.1–9.3%	0.2–1.0 mg/L	0.003–0.078 µg/g	[4]
Glucose	Electrochemical sensor (GCE)	Stable signal	0.05–9.5 mM	1.4 µM	[6]
Sucrose	Electrochemical sensor (SPE)	RSD<2%	0.5 - 4.5 mM	0.02 mM	[7]
Caffeine	Electrochemical sensor (GCE)	4.5%	1–30 µM	20µM	[8]
Fructose	Electrochemical Sensor(GCE)	Stable signal	0.3 - 1.5 M	0.008 mM	[9]
Rebaudioside A	Electrochemical Biosensor (Graphite)	3.9%	2-14 µM	0.23µM	Present work

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