

Supplementary Information

Reduced graphene oxide–Copper thiotungstate Composite for Enhanced Photoelectrochemical Performance

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1. Synthesis of rGO

Reduced graphene oxide (rGO) was synthesized using Hummer's method. 2 g of graphite powder was dispersed in a glass bottle containing concentrated H₂SO₄ and stirred magnetically overnight. The glass bottle was then kept in ice bath and 25 g KMnO₄ was then added to it slowly while stirring. The above mixture was stirred magnetically for about 5 hrs. and then it was added to 500 mL water carefully keeping it in an ice bath followed by the addition of 30 mL H₂O₂ (30%). The product obtained i.e.; graphite oxide was washed with 20 % HCl for removing metal ions. The exfoliation and reduction of graphite oxide was done by thermally treating it at 1100 °C for 10 min in inert atmosphere. The rGO thus obtained was used further for the synthesis of Cu₂WS₄-rGO.

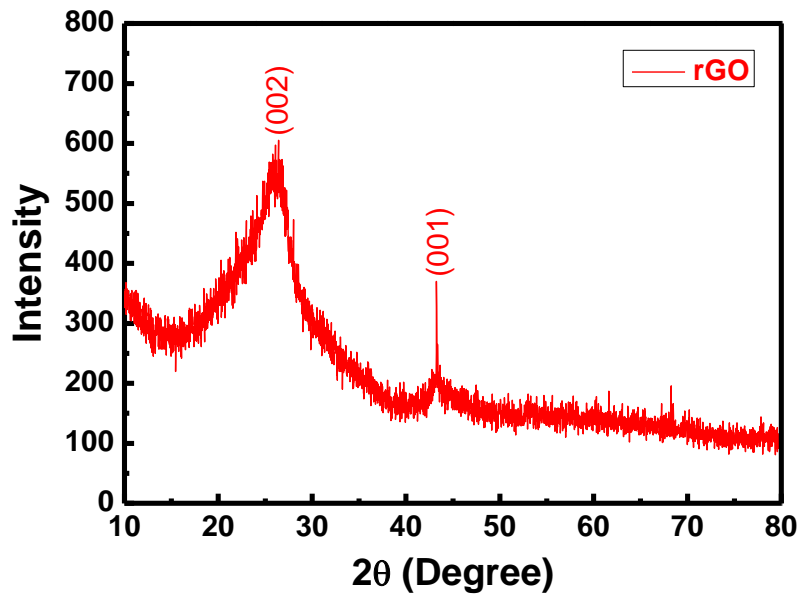


Fig. S1 Powder X-ray diffraction pattern of rGO.

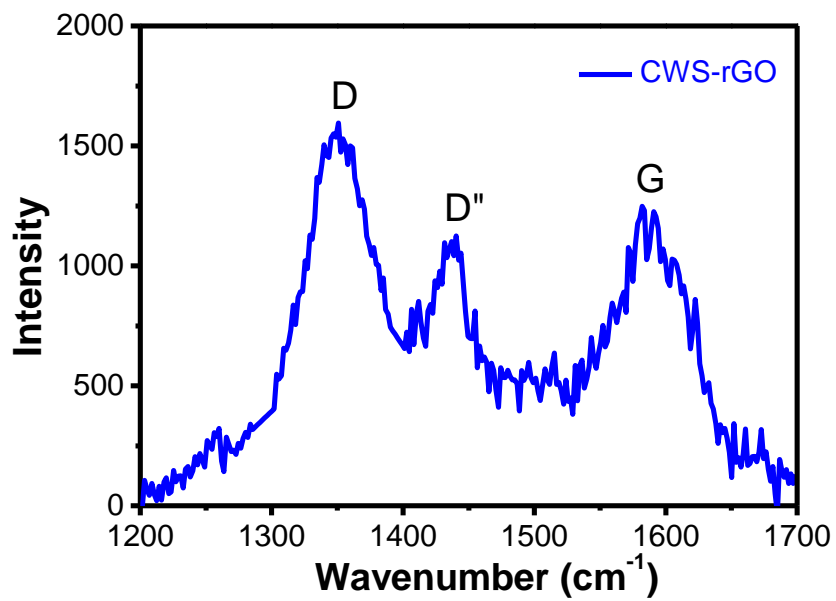


Fig. S2 Raman spectra of CWS-rGO showing the presence of D, D'' and G bands.

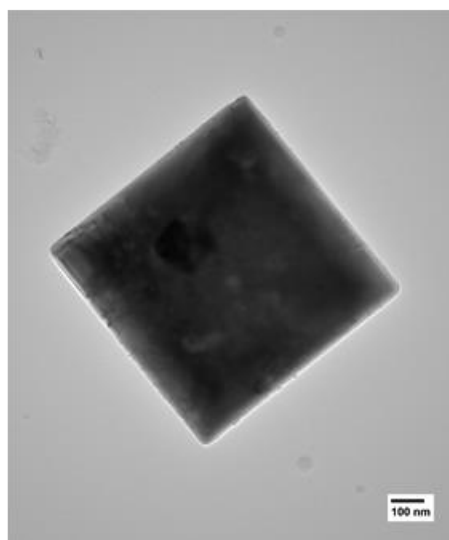


Fig. S3 Transmission electron microscope (TEM) image of CWS.

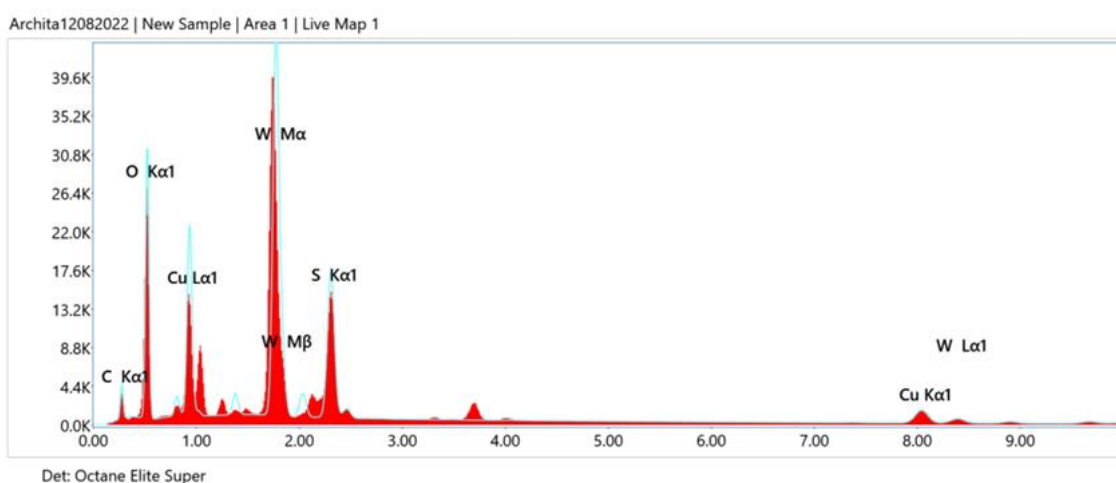


Fig. S4 Energy dispersive X-ray (EDX) spectra of CWS-rGO.

Table S1. Atomic percentage of elements in CWS-rGO using FESEM-EDX

Element	Atomic %
C	34.8
O	46.4
S	9.5
Cu	6.2
W	3.1

Table S2. Comparison of current density values obtained @ 1.23 V and 1.98 V vs RHE in both dark and illuminated conditions

Sample	Current density (mA/cm ²) @1.23 V		Current density (mA/cm ²) @1.98 V	
	Dark	Light	Dark	Light
CWS	0.0001	0.0107	0.7792	1.2347
CWS-rGO	0.00024	0.0172	1.9982	3.1771

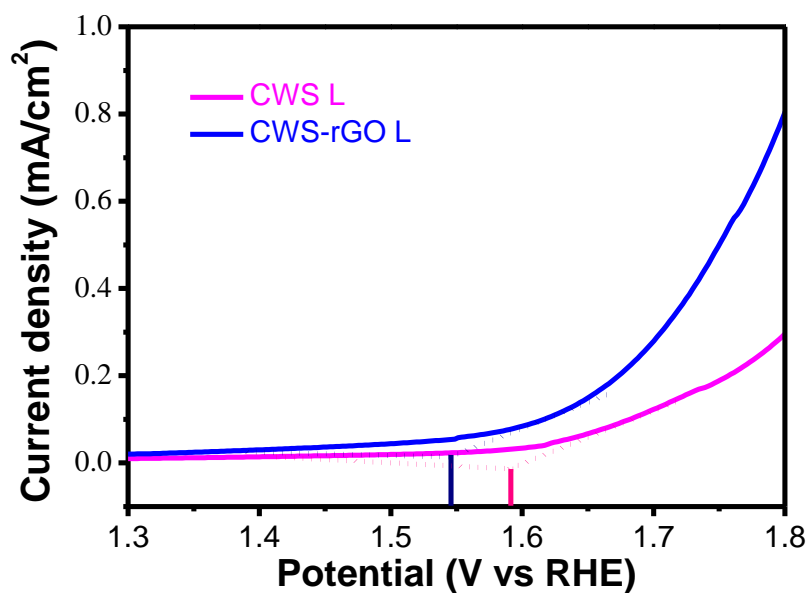


Fig. S5 Onset potential for CWS and CWS-rGO composite.