

Supporting Information

One Watt LED Lamp as Visible-Light Source for Improving Photoelectrocatalytic Oxidation of Ethanol Using Reduced Graphene Oxide Modified with Pt Nanoparticles Decorated onto CdS Nanowires

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Preparation of Graphene Oxide (GO) Nanosheets. GO was synthesized using a modified Hummer's method.⁵⁶ Briefly, 0.5 g of graphite and 0.5 g of NaNO₃ in 23 mL of 12.0 M H₂SO₄ were stirred in an ice bath for 15 min. Then 4.0 g of KMnO₄ was slowly added in an ice bath to yield a purple-green mixture. This suspension was transferred to a 40 °C water bath and magnetically stirred for 90 min. The dark brown colored paste was diluted with the slow addition of 50 mL of deionized water (DI) and allowed to stir for a further 10 min. A 6 mL portion of H₂O₂ was slowly added to quench the solution to produce a golden-brown sol. A further 50 mL of DI water was added, and the resultant product centrifuged and washed with warm DI water repeatedly to adjust the pH to ~6. Finally the product was dried at 80 °C for 24 h.

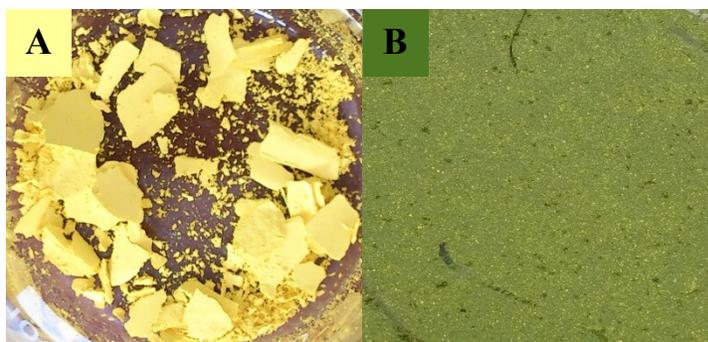


Figure S1. CdS NWs (A) and rGO/CdS NWs/Pt NPs (B).

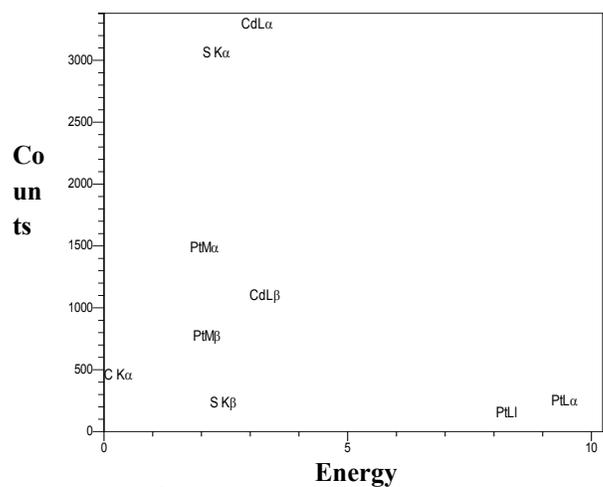


Figure S2. EDX for rGO/CdS NWs/Pt NPs nanocomposite.

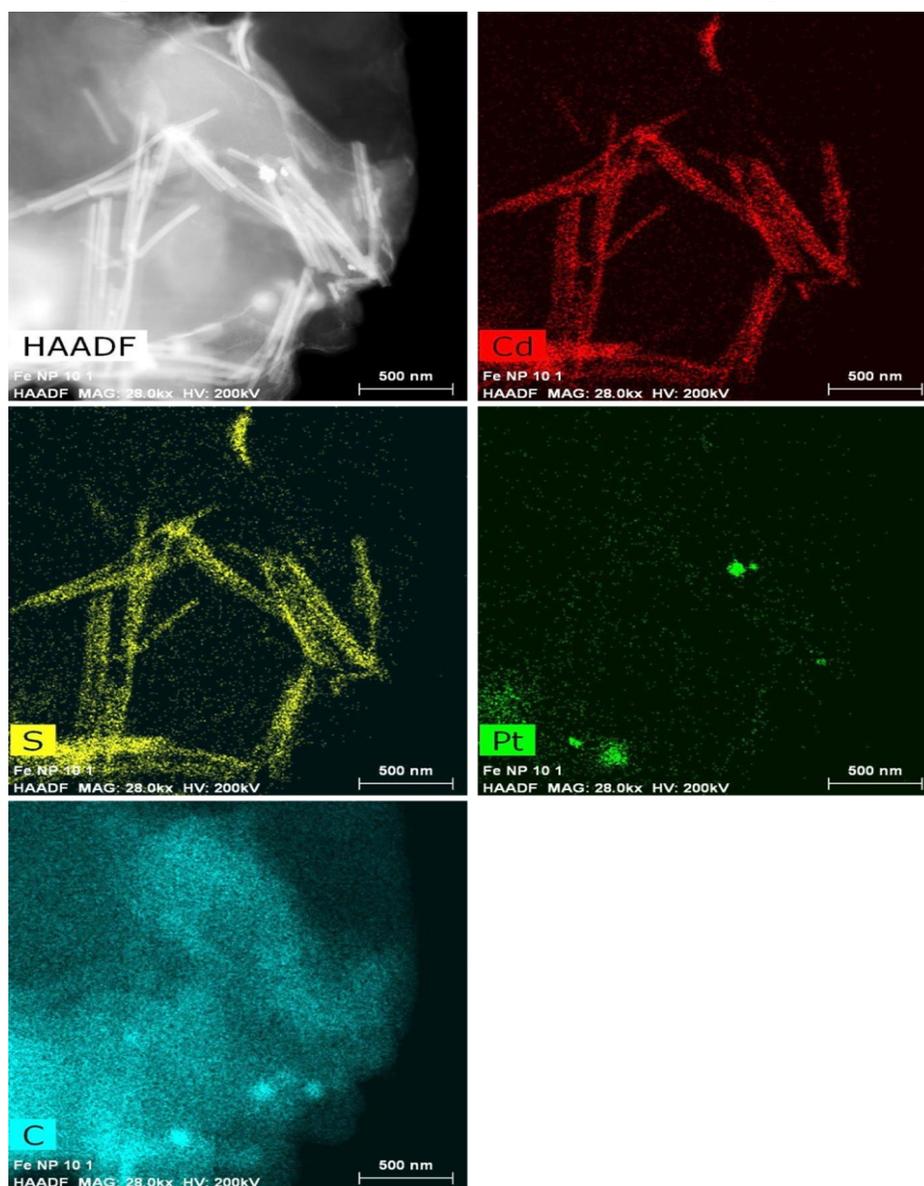


Figure S3. The HRTEM with low magnification and the elemental mapping results for rGO/CdS NWs/Pt NPs nanocomposite.

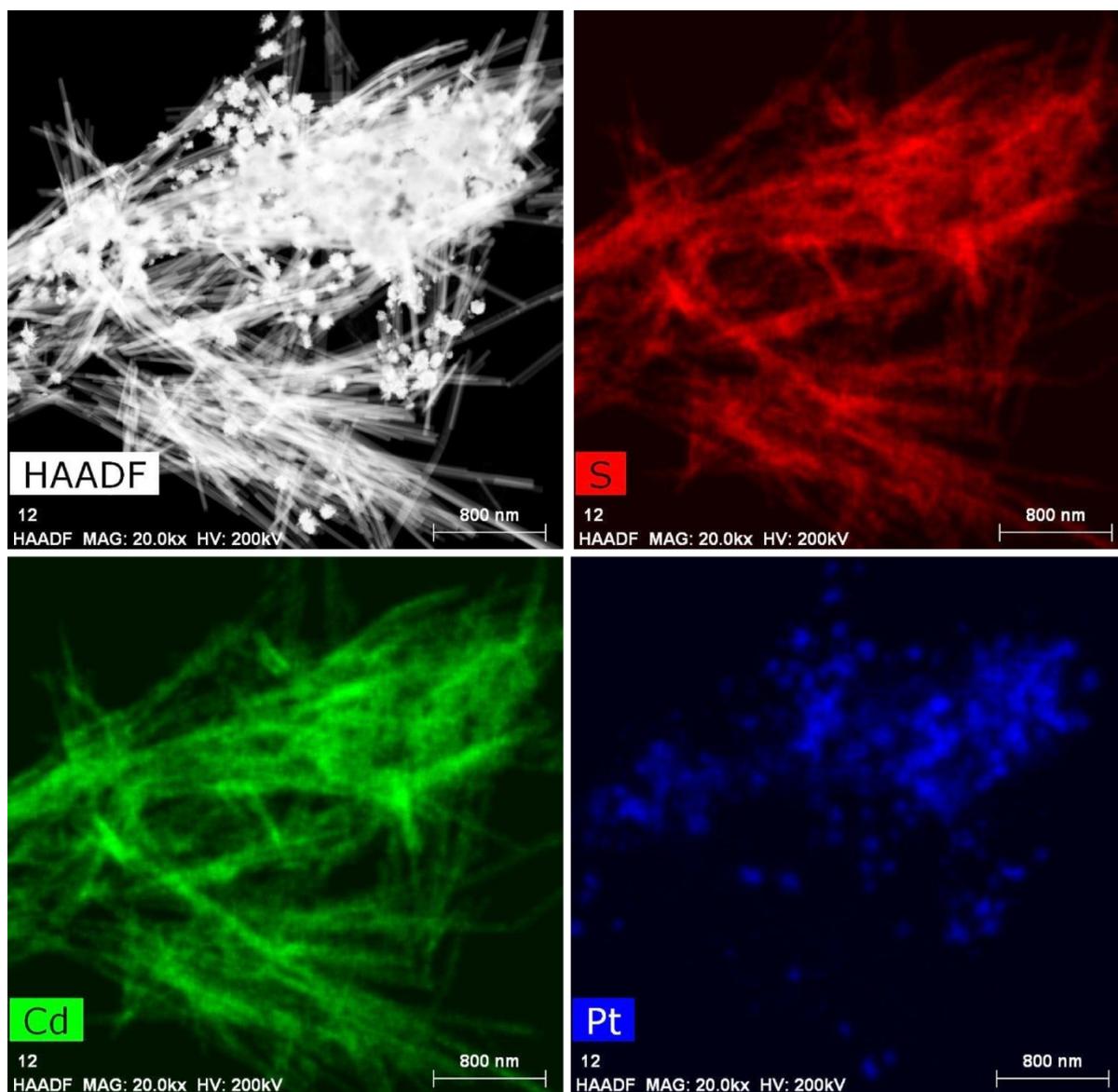


Figure S4. The HRTEM with low magnification and the elemental mapping results for rGO/CdS NWs/Pt NPs nanocomposite.

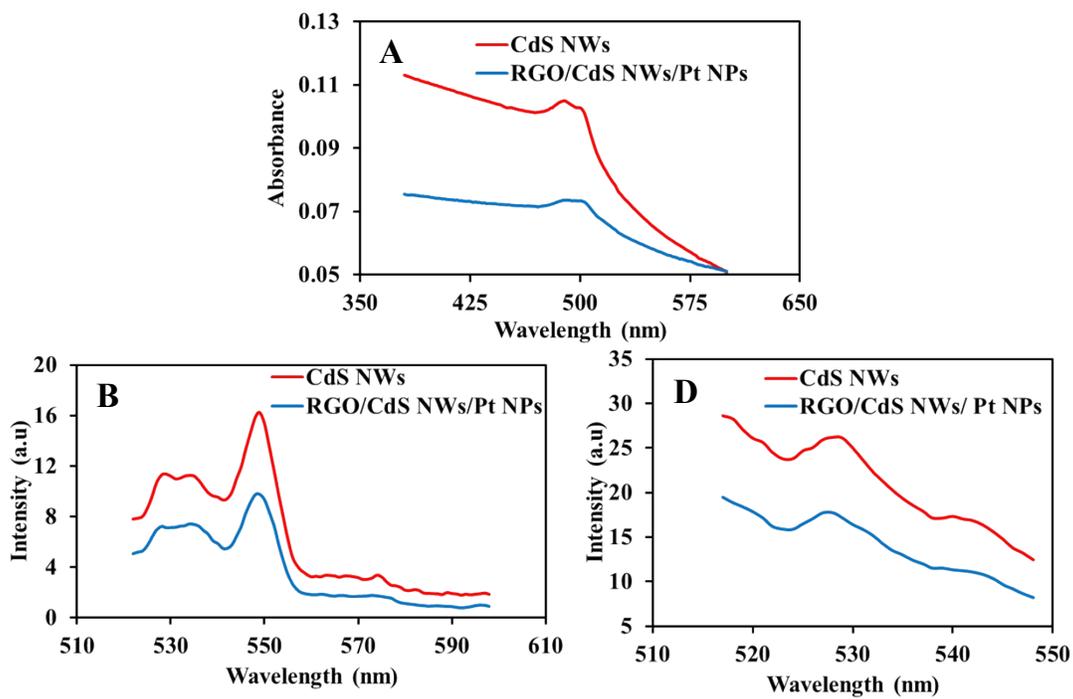


Figure S5. UV-vis (A) and fluorescence spectra (B) and (C) with excitation wavelength at 403 and 488 nm, respectively.

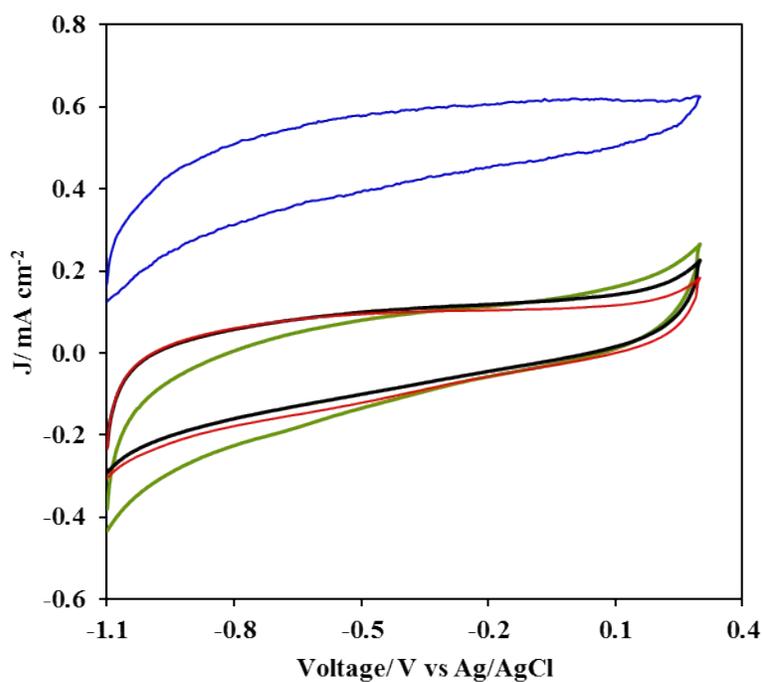


Figure S6. CV for modified glassy carbon electrode with CdS NWs in KOH 2.0 M at scan rate 50 mV s⁻¹, green and black line without blue LED light irradiation and with blue LED light irradiation, respectively. Red and blue line as green and black line without blue LED light irradiation and with blue LED light irradiation for 3.0 M ethanol, respectively.