

Supporting Document

Efficient Visible Light Driven Double-Well Based Pt/CdS/3D-Graphene Heterostructure for Electrocatalytic and Photo-electrocatalytic Methanol Oxidation

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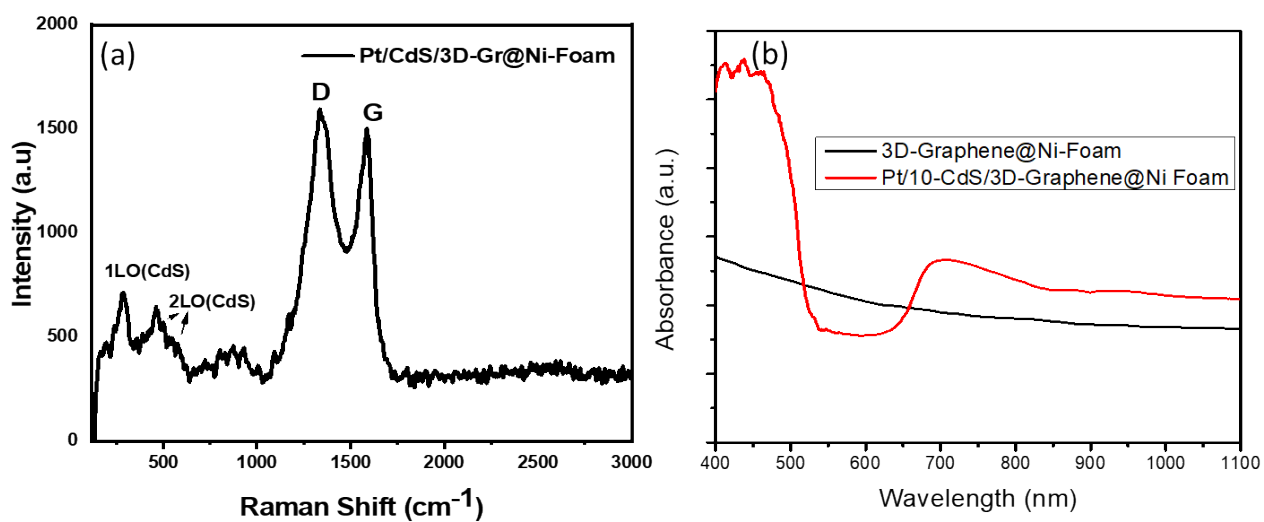


Fig S1. Raman Spectrum of (a) Pt/10-CdS/3D-Gr@Ni-Foam and UV-Visible spectra of (b) 3D-Gr@Ni-Foam and Pt/10-CdS/3D-Gr@Ni-Foam

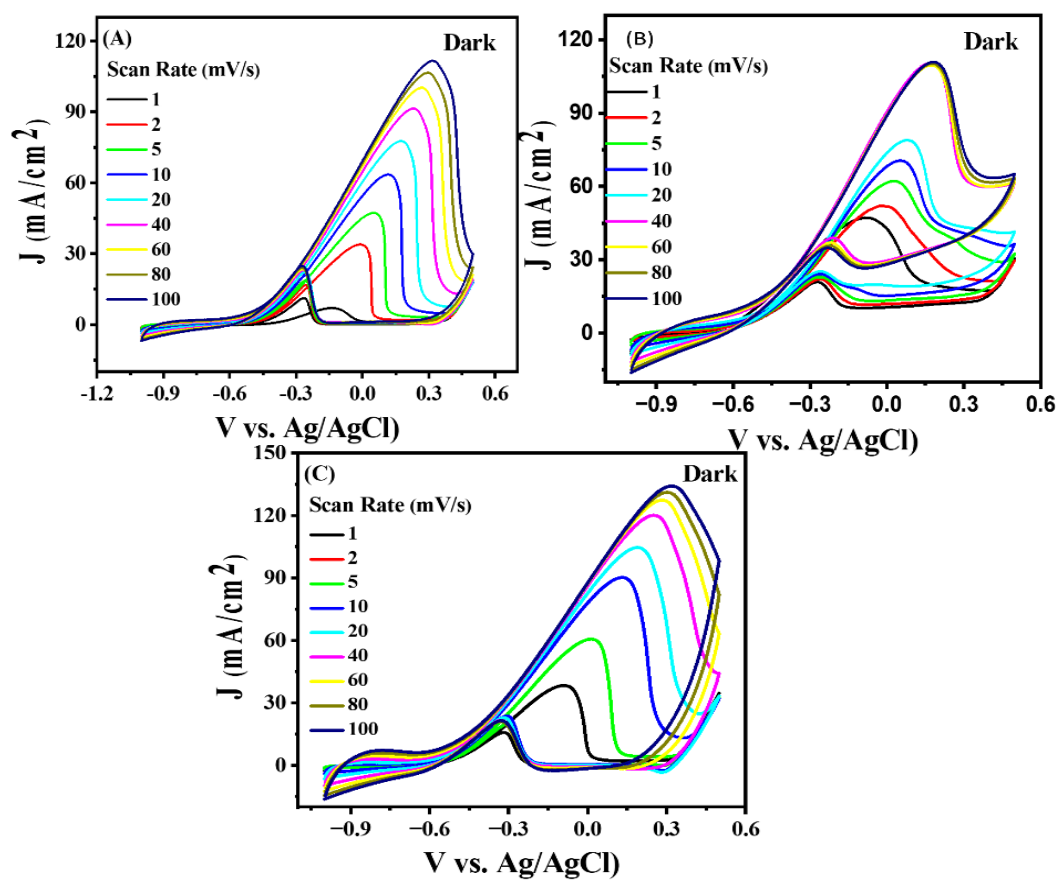


Fig S2. Cyclic Voltammogram of (A) Pt/Graphene@Ni-foam, (B) Pt/5-CdS/Graphene@Ni-foam (C) Pt/15-CdS/Graphene@Ni-foam

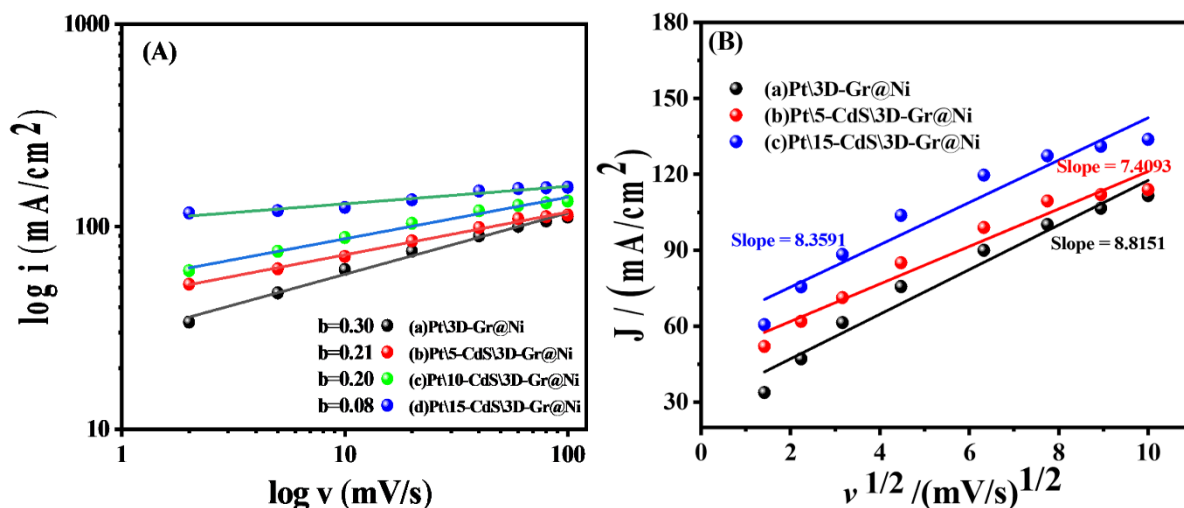


Fig S3. Cyclic Voltammetry (A) Plots of current density vs scan rates for values of “b” under dark for (a) Pt/Graphene@Ni-foam (b) Pt/5-CdS/Graphene@Ni-foam, (c) Pt/10-CdS/Graphene@Ni-foam (d) Pt/15-CdS/Graphene@Ni-foam (B) A graphical representation of the direct relationship of peak current density (I) versus \sqrt{v} scan rate (v) in 1 M CH₃OH/1M KOH solution for (a) Pt/Graphene@Ni-foam (b) Pt/5-CdS/Graphene@Ni-foam, (c) Pt/15-CdS/Graphene@Ni-foam

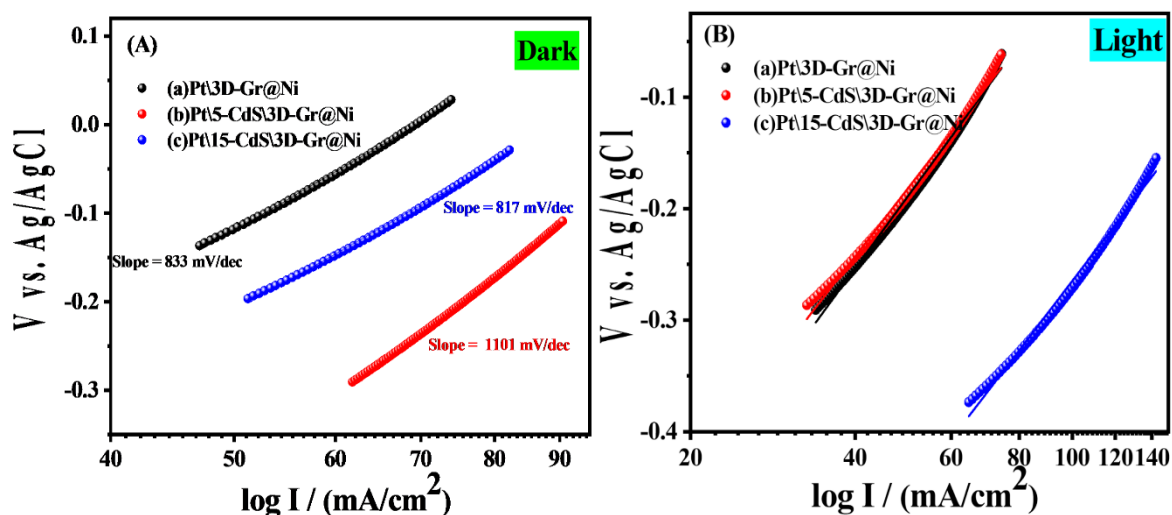


Fig S4. Current density Tafel plots in 0.5 M KOH + 0.5 M CH₃OH at scan rate of 10 mV s⁻¹ for (a) Pt/Graphene@Ni-foam (b) Pt/5-CdS/Graphene@Ni-foam, (c) Pt/15-CdS/Graphene@Ni-foam (A) In Dark (B) in Light

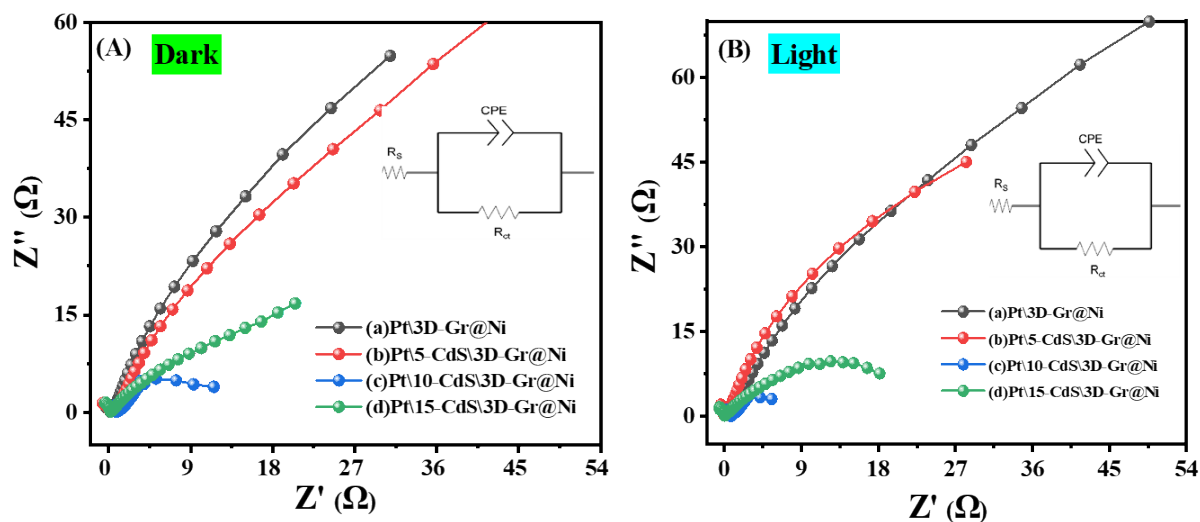


Fig. S5 EIS Open Current Potential of Pt/Graphene@Ni-foam, Pt/x-CdS/Graphene@Ni-foam (A) Nyquist plot in Dark (B) Nyquist plot in Light

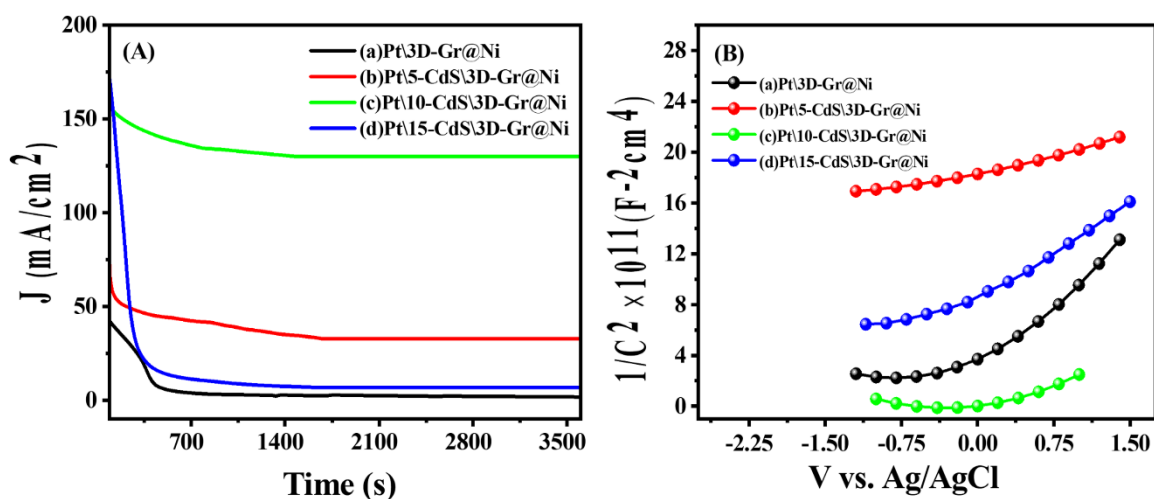


Fig.S6 (A) Chronoamperometry plot (B) Flat band potential of (a) Pt/3D-Gr@Ni-Foam (b) Pt/5-CdS/3D-Gr@Ni-Foam, (c) Pt/10-CdS/3D-Gr@Ni-Foam (d) Pt/15-CdS/3D-Gr@Ni-Foam