

# Hierarchical CdMoO<sub>4</sub> Nanowire-Graphene composite for Photocatalytic Hydrogen Generation under Natural Sunlight

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# Supporting Information

## Experimental Work:

### A) Synthesis of (CdMoO<sub>4</sub> Nanowires)

The chemicals used for the reaction e.g Cadmium nitrate and Ammonium Molybdate all Qualigens make were used without any purification. The solvent system used for CdMoO<sub>4</sub> nano wire synthesis is methanol: ethylene glycol in 3:1 ratio and denoted as a MEG (3:1). Cadmium nitrate dissolved in methanol (120 ml) and Ammonium molybdate were dissolved in ethylene glycol (30 ml ) separately. Ammonium molybdates solution was added drop wise into Cadmium nitrate solution at room temperature with constant stirring. The clear solution of cadmium nitrate turns into little turbid after the addition of the Ammonium molybdates to it. Followed by allow the solution to 10 more minutes to stir with drop wise addition of hydrazine hydrate. The solution becomes faint yellowish coloured. After complete addition mixture was stirred for more 10 min. The reaction mixture is then transferred in teflon lined reactor, packed it in steel jacket. Then the reactor was kept in oven at 150 °C for 24 hours. After completion of the reaction, the reactor was allowed to cool naturally. The product is filtered by using whatman filter paper no. 41. The product is dried at 80 °C for 4 hours in oven. The collected powdered sample further analyzed by various characterization techniques.

### B) Synthesis of CdMoO<sub>4</sub> prismatic microstructures

The synthesis of CdMoO<sub>4</sub> having Burger like morphology via insitu assembling of prismatic nano particle was synthesized at identical condition like synthesis of CdMoO<sub>4</sub> nano wires except solvent system. The solvent system used for the CdMoO<sub>4</sub> having Burger like morphology is methanol and ethylene glycol in 1:1 ratio and it is denoted as a MEG (1:1).

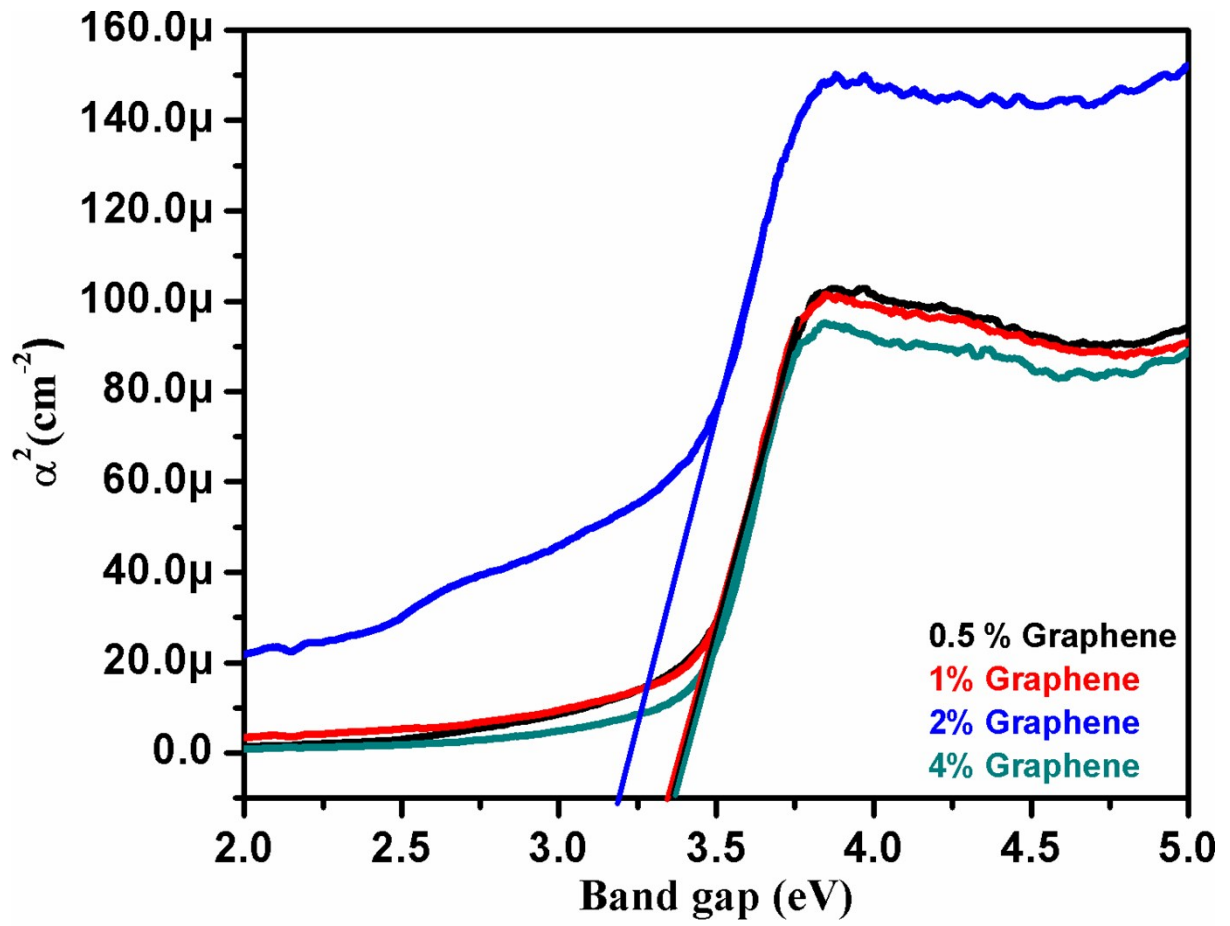


Figure. S1 Tauc plot of CdMoO4 graphene composite materials.

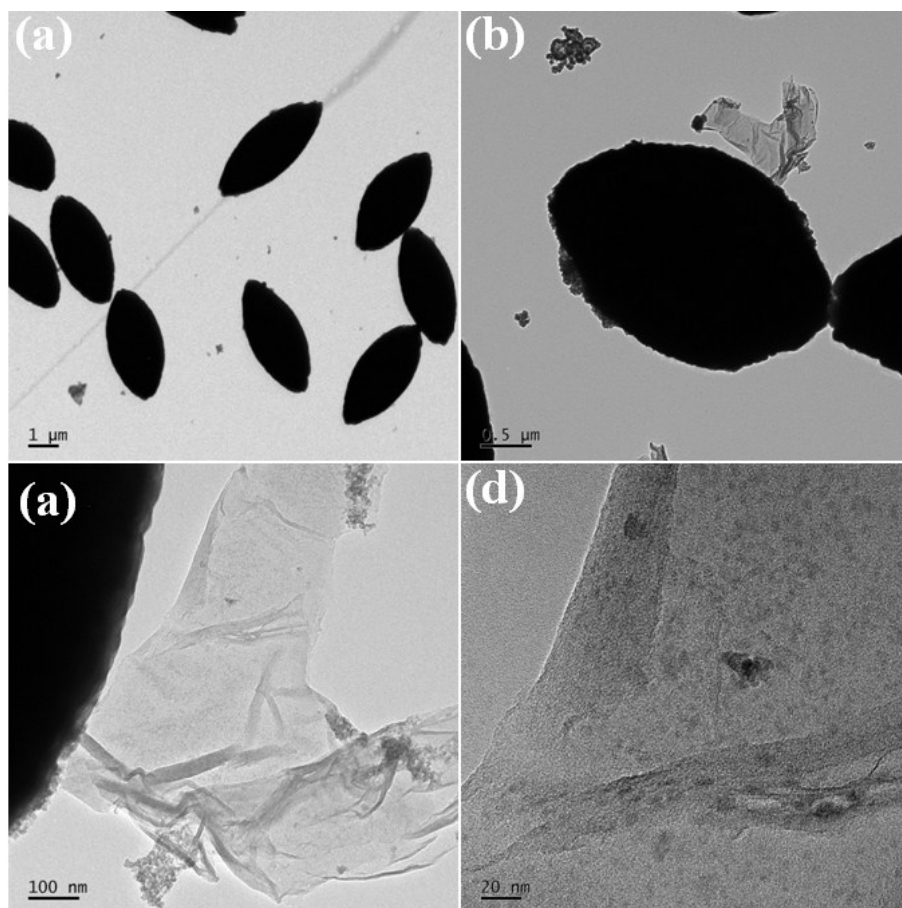


Figure. S2 (a-d) TEM images of as synthesized CdMoO<sub>4</sub> nanowires-Graphene

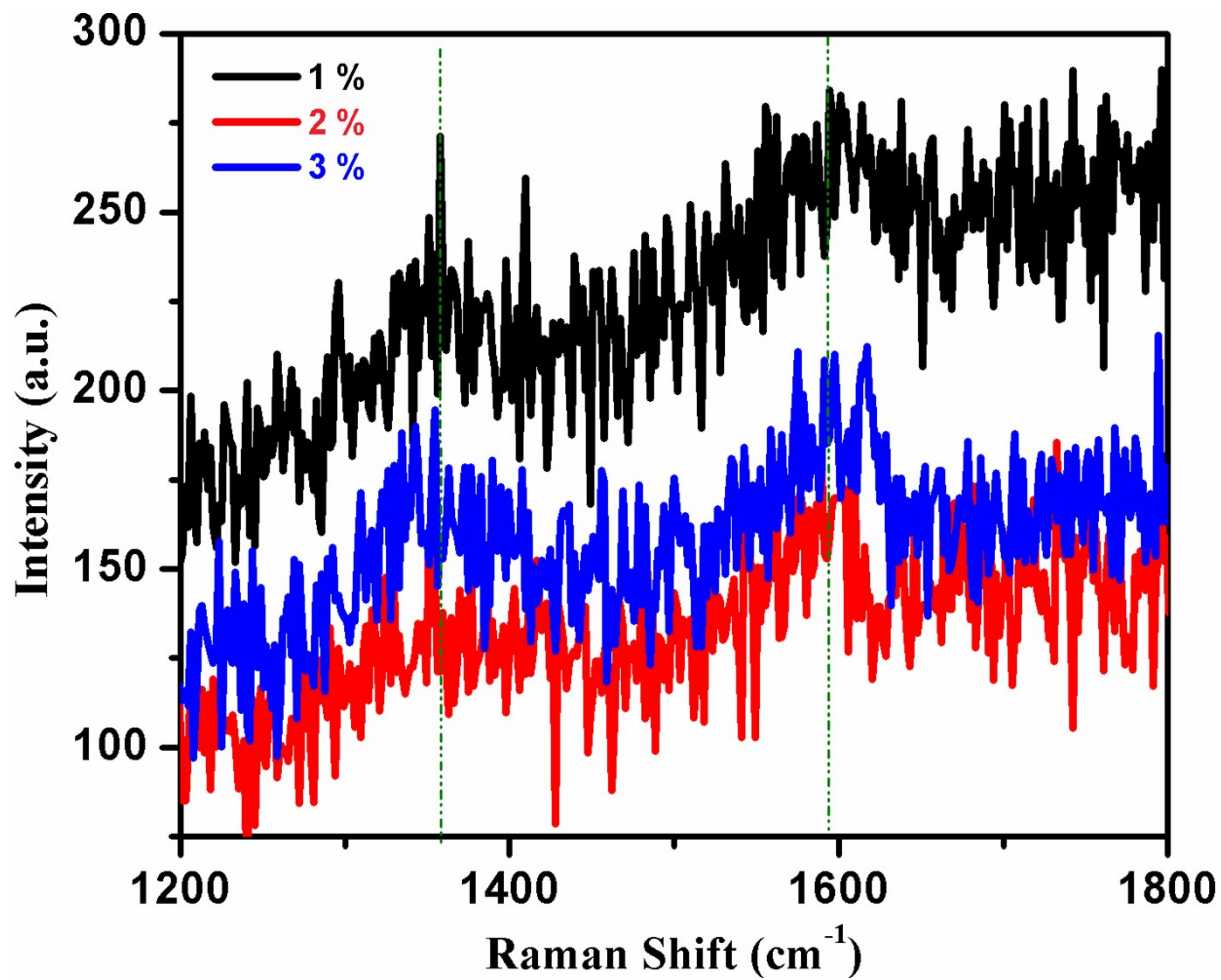


Figure. S3 The magnified Raman spectra for D and G band of CdMoO<sub>4</sub> nanowires and its 1, 2 and 4 weight % graphene composite.