Supporting Information:

Enhanced Electrocatalytic H_2S Splitting on Multiwalled Carbon Nanotubes-Graphene Oxide Nanocomposite

Shankar S. Narwade, Shivsharan M. Mali, Akash K. Tapre and Bhaskar R. Sathe*

Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad- 431 004 (MS) India.
Email: *bhaskarsathe@gamil.com; bsathe.chemistry@bamu.ac.in*
Telephone: +91-8275306471

S1: Raman spectroscopy:

Raman spectroscopy has been widely used to know the extent of functionalization of carbon based nanomaterials. In Fig. S1, the electronic structure of the as-prepared catalysts is revealed through the characteristic peaks at 1342 cm^{-1} (the D band indicating disordered sp^2 hybridized carbons of GO) and 1559 cm^{-1} (the G band corresponding to the tangential stretching vibration of the GO hexagonal ring). The Raman data of GO shows D and bands at 1339 cm^{-1} and 1554 cm^{-1} respectively, whereas, for O-MWCNTs is D band 1389 cm^{-1} and G band is 1581 cm^{-1}. All the carbon based electrocatalytic system shows a stronger D band compared to G band, which could be due to effective oxidation of both graphene and MWCNTs. Moreover, the intensity ratio of the D and G bands (I_D/I_G), which is the quantitative measure for edge plane exposure and is commonly used as a quantization standard for doping and chemical modification, has a positive relationship with the content of structural heterogeneity in MWCNTs@GO, GO and O-MWCNTs is 0.860, 0.861 and 0.878 cm^{-1} respectively. This further proves that the introduction of short O-MWCNTs with lots of GO edges can give rise to enrich the types of catalytic active sites. The results of elemental analysis and Raman spectra demonstrate O-MWCNTs can be doped into the defect structural sites to become substitutive GO to lessen the number of structural defects. In addition, the introduction of O-MWCNTs into the GO contributes to the shift of the G band towards the low frequency region, which is in good agreement with earlier reports from literature.

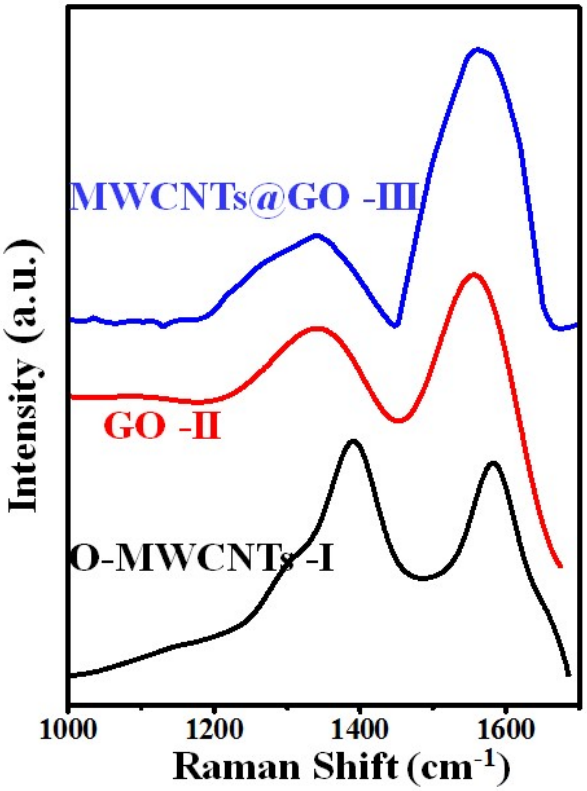

Figure S1. Superimposed Raman spectra of (I) O-MWCNTs, (II) GO and (III) MWCNTs@GO respectively.

Referance

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Table S1. Current density of hydrogen evolution reaction for MWCNTs@GO compared with other catalysts used in the previous works and related potential catalysts at a given potential from literature. It includes precious materials like Pt/C, metallic sulfides, metallic oxides, metal organic compound and carbon materials are demonstrated for H2 production from H2S and are summarized herein. As shown in the Table S1, the MWCNTs@GO catalysts displayed the superior activity than any of the contrast catalysts mentioned in the previous works.

Sr. No.	Nanocomposites	Onset Potential (V)	Referance
1	40% Pt/C	0.3	1
2	CuS	0.3	2
3	CoS	0.3	3
4	MoS_2	0.3	4
5	Fe_3O_4	0.3	5
6	**Ni@NGs**	0.3	6
7	**Co@NGs**	0.3	6
8	**CoNi@NGs**	0.3	6
9	Graphite	0.3	7
10	Graphene	0.3	7
11	CNTs	0.3	8
12	**MWCNTs@GO/GCE**	**-0.5**	**This Work**

Referances

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