Supporting Information

Deep Eutectic Solvent-Mediated Synthesis of $Ni_3V_2O_8$/N-Doped RGO for Visible-Light-Driven H_2 Evolution and Simultaneous Degradation of Dyes

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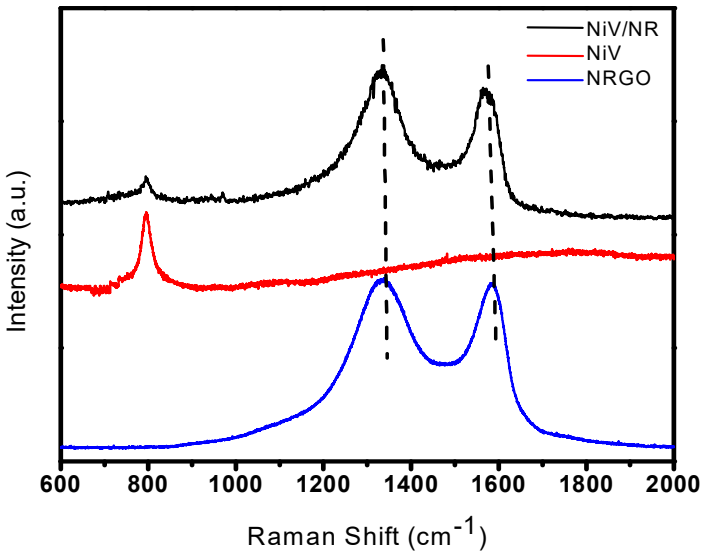

Figure S1. Raman spectra of NRGO, NiV and NiV/NR.

Raman analyses were carried out to identify the presence of different elements in the composite material by determining its vibrational and rotational modes. The Raman spectra of NRGO, NiV, and NiV/NR are shown in Figure S1. The Raman spectra of the NRGO exhibit the presence of D and G bands at around 1587 cm^{-1} and 1332 cm^{-1}, respectively. The bond V-O in NiV has asymmetric stretching vibrations, which causes the weak peak at 794 cm^{-1}. This peak's intensity is diminished in NiV/NR as a result of the obstruction posed by NRGO. Additionally, the coupled

actions of NiV/NR cause the peak to broaden in composite material. In addition, we see D and G bands for NRGO, which appear at identical places of NRGO with slight shift to lower intensities for NiV/NR and are used to criticize the lack of modulation or change in the composite. The in-plane bond-stretching motion is probably linked to the G band graphitic materials containing sp^2 carbon atoms. When it comes to flaws, functional groups, and wrinkles, the D band gets some help. Thus, the sp^2 hybridization of graphene atoms is unmistakably displayed.

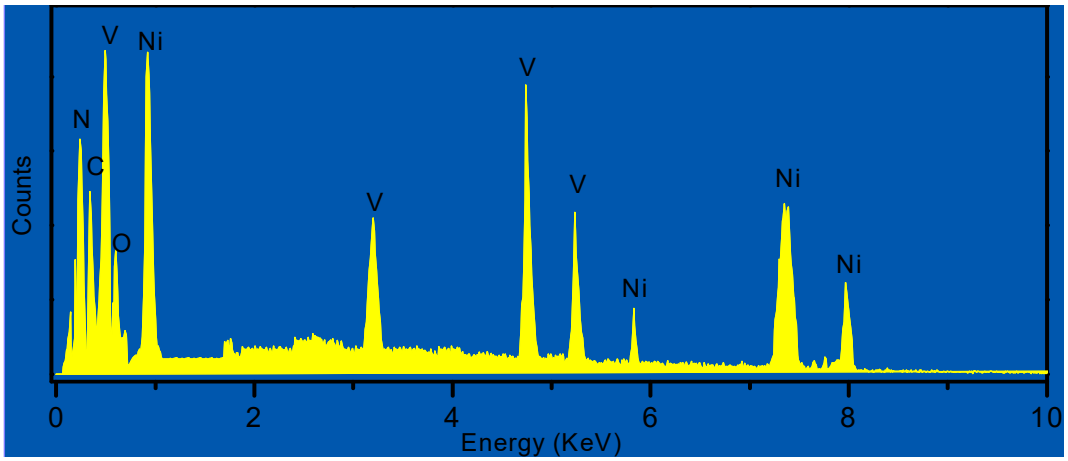

Figure S2. EDS spectra of NiV/NR hybrid

EDX spectra of NiV/NR hybrid are displayed in Figure S2. The presence of nickel, vanadium, carbon, and oxygen can be seen prominently in the spectra. Since the spectra show no traces of other impurities, the sample must be pure. Table S1 gives the details of % weight of elements present in the NiV/NR hybrid.

Table S1: Elemental composition of NiV/NR hybrid

Element	**Weight %**
Ni	23.4
V	15.6
O	26.7
N	6.08
C	28.22