

**Mechanochemically preparation of graphdiyne (C_nH_{2n-2}) based Ni-doped MoS_2
S-scheme heterojunctions with in situ XPS characterization for efficient
hydrogen production**

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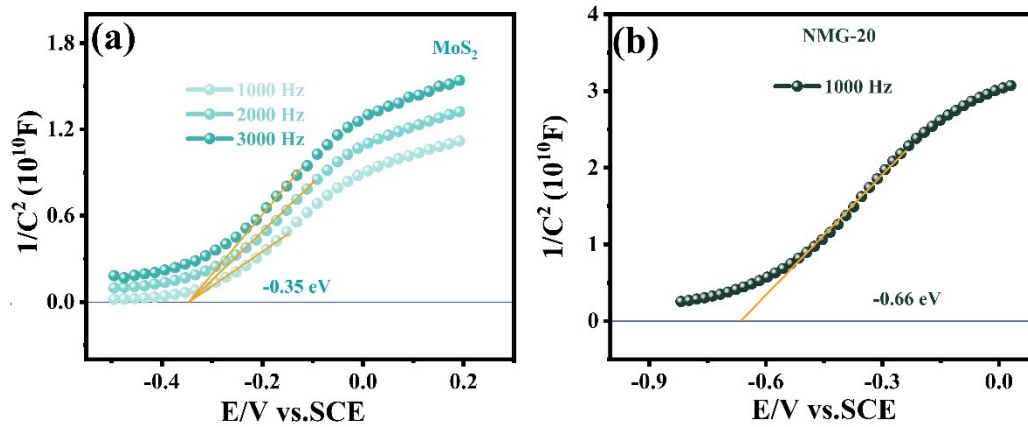


Fig. S1 M-S curves of (a) MoS_2 and (b) NMG-20.

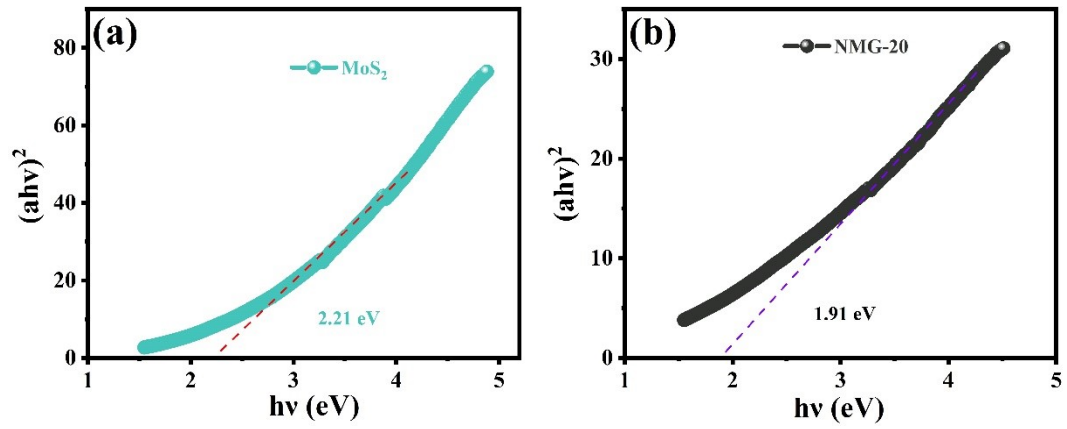


Fig. S2 The band gap of (a) MoS₂ and (b) NMG-20.

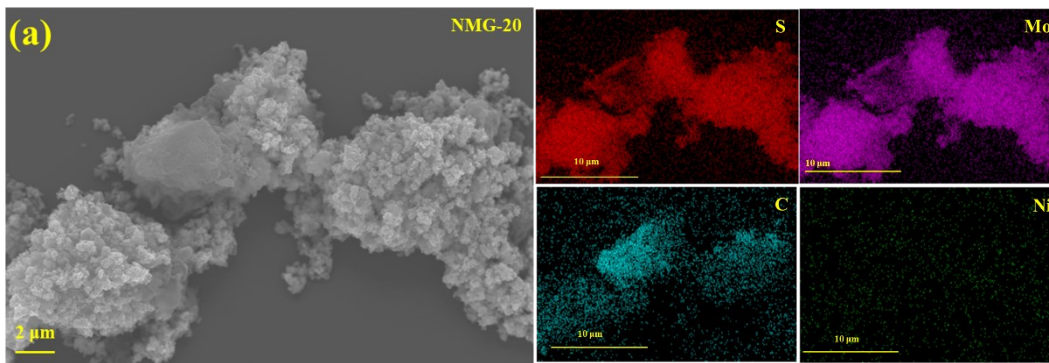


Fig. S3 SEM mapping of NMG-20.

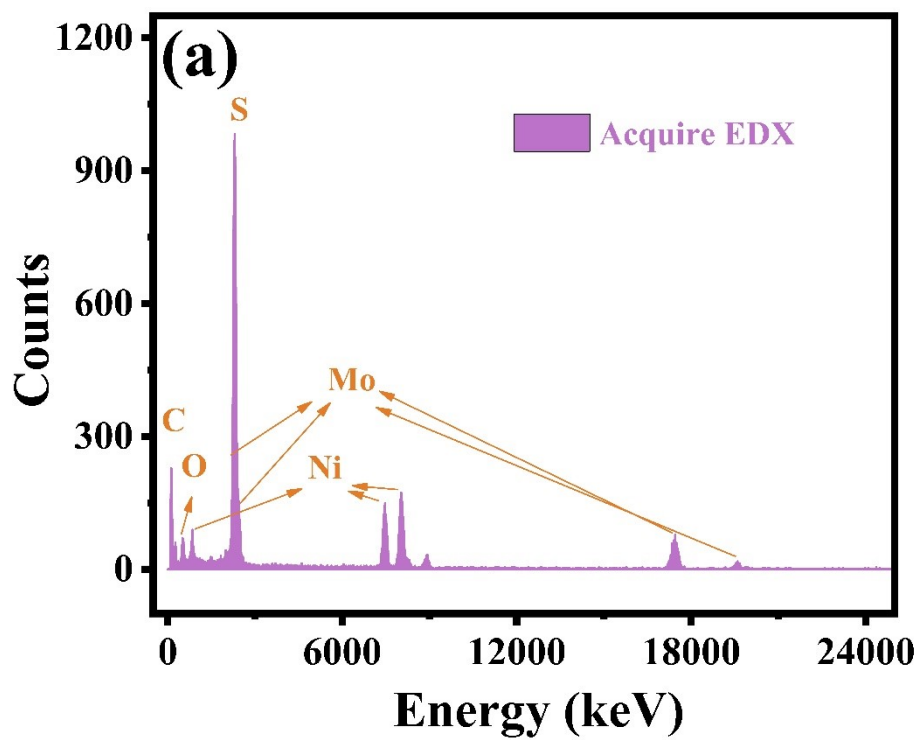


Fig. S4 EDX of NMG-20.

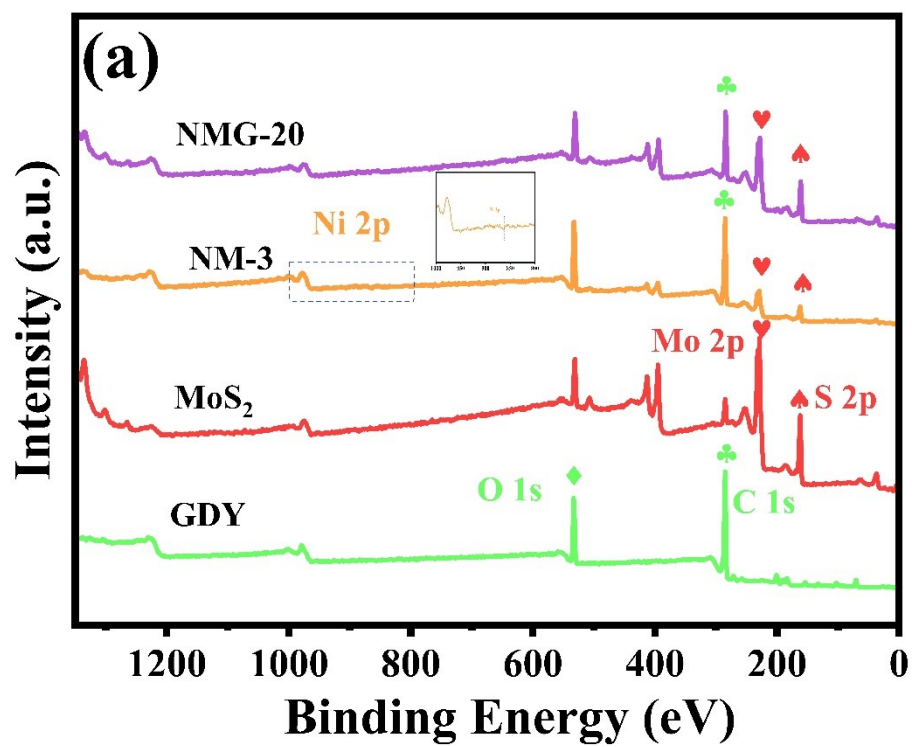


Fig. S5 Survey spectrum of GDY, MoS₂, NM-3, NMG-20.

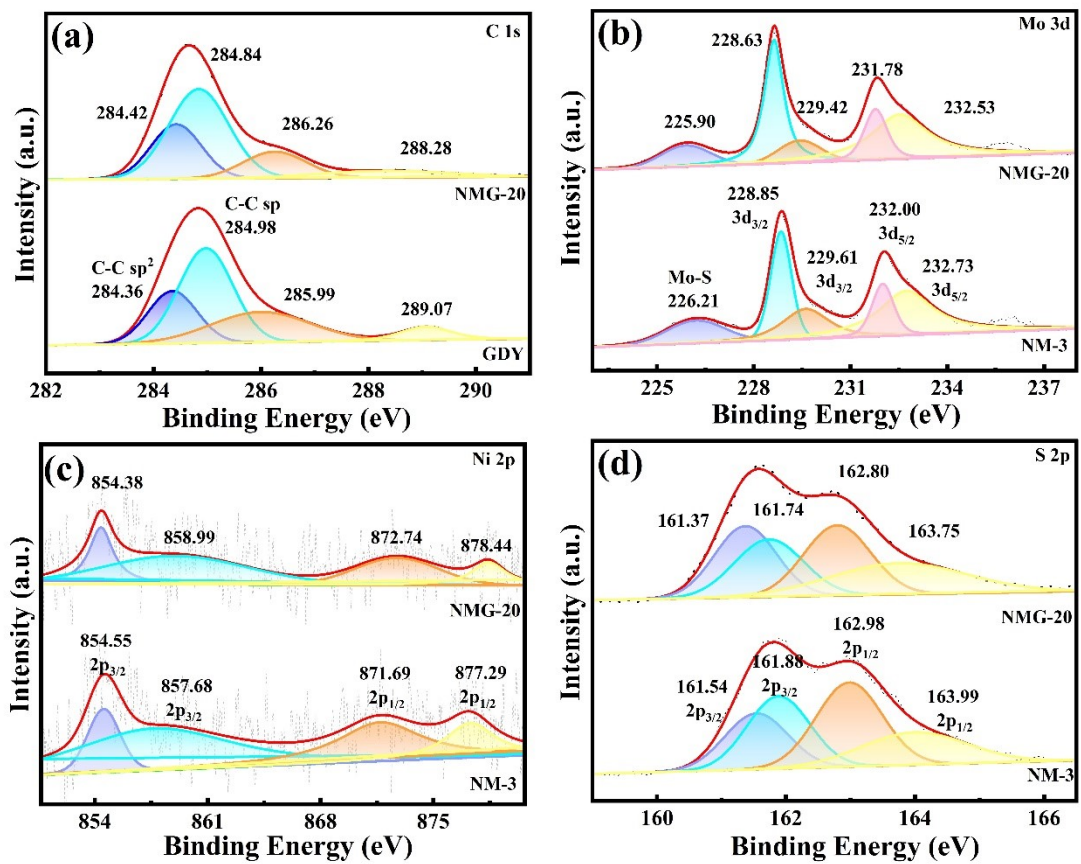


Fig. S6 XPS spectroscopy of (a) C 1s; (b) Mo 3d; (c) Ni 2p (d) and S 2p in NMG-20