

## Supporting Information

### ***In situ* synthesis of ultrafine metallic MoO<sub>2</sub>/carbon nitride nanosheets for efficient photocatalytic hydrogen generation: Prominent cocatalytic effect**

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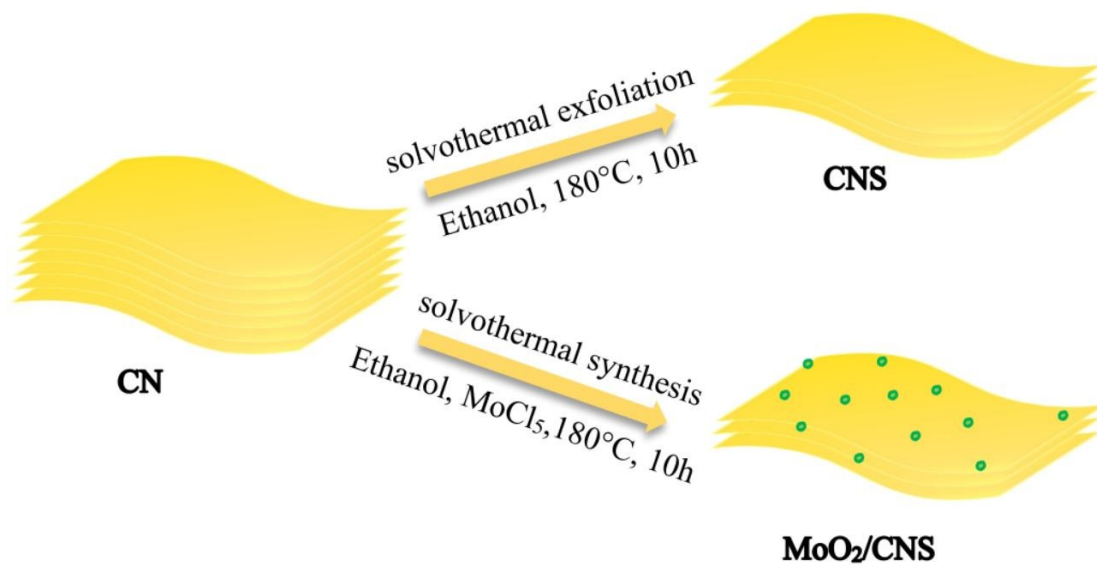


Fig. S1 Schematic illustration of CNS and MoO<sub>2</sub>/CN preparation procedures.

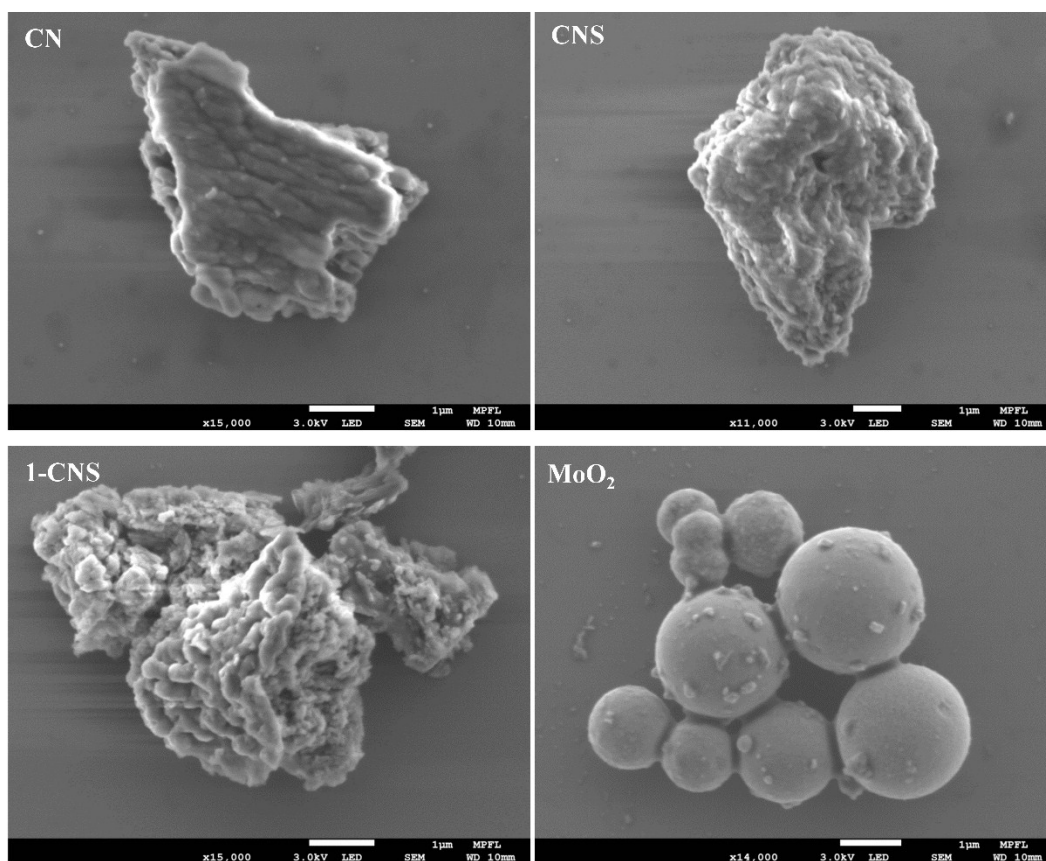


Fig. S2 SEM images of CN, CNS, 1-CNS and MoO<sub>2</sub>.

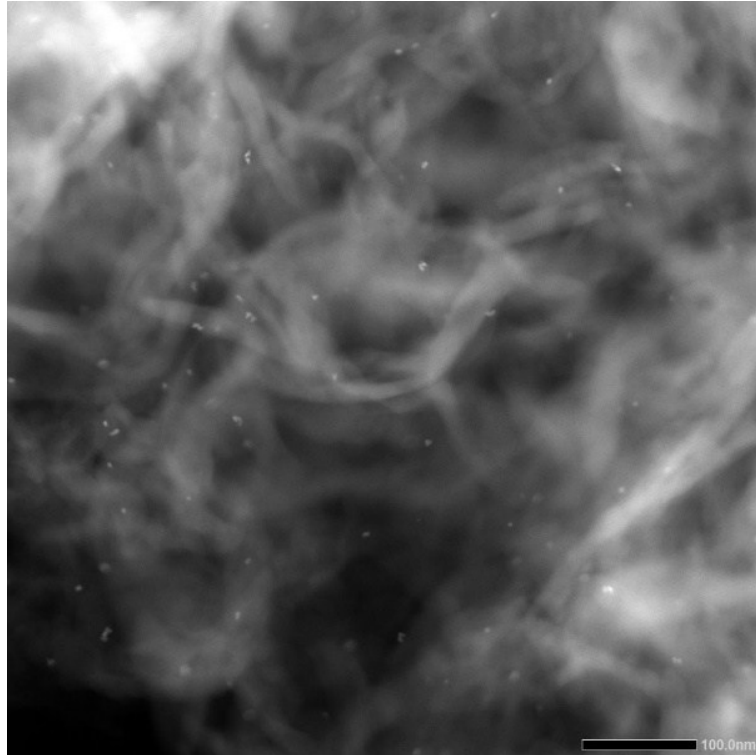


Fig. S3 STEM image of 1-CNS with large scale.

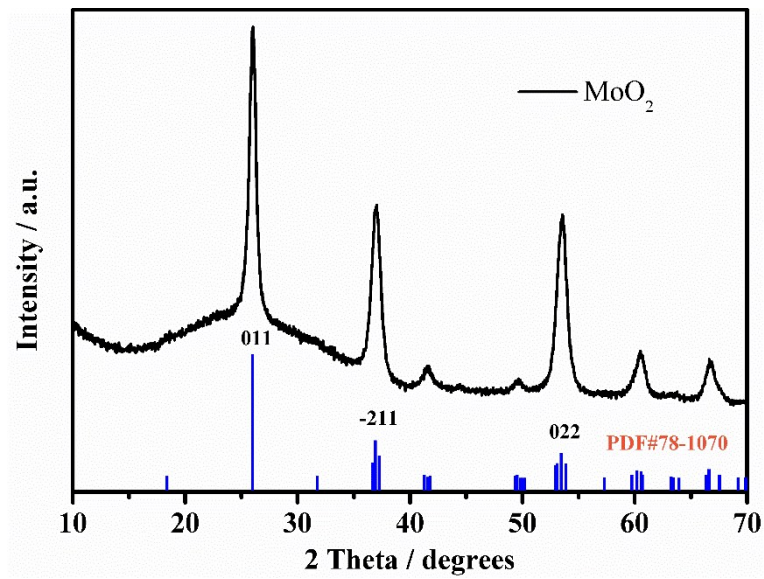


Fig. S4 XRD pattern of pure MoO<sub>2</sub>.

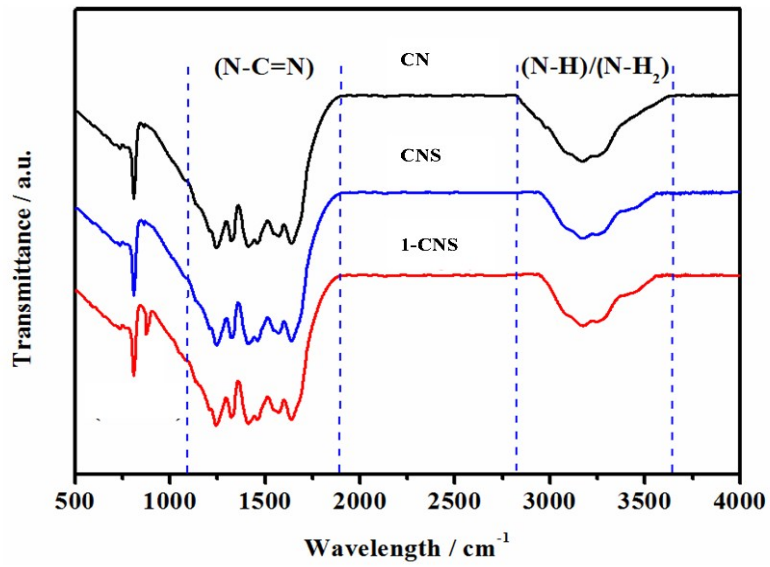


Fig. S5 FITR spectra of CN, CNS and 1-CNS.

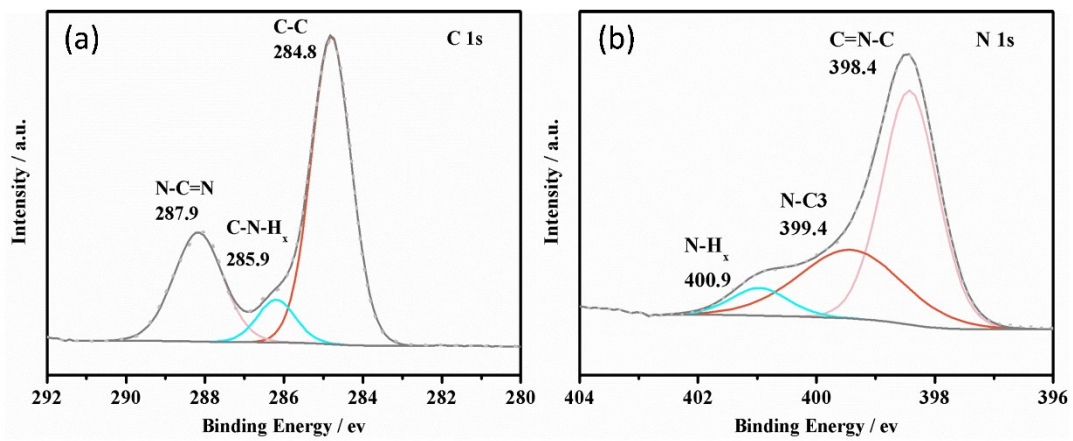


Fig. S6 XPS spectra of C 1s and N 1s of CNS.

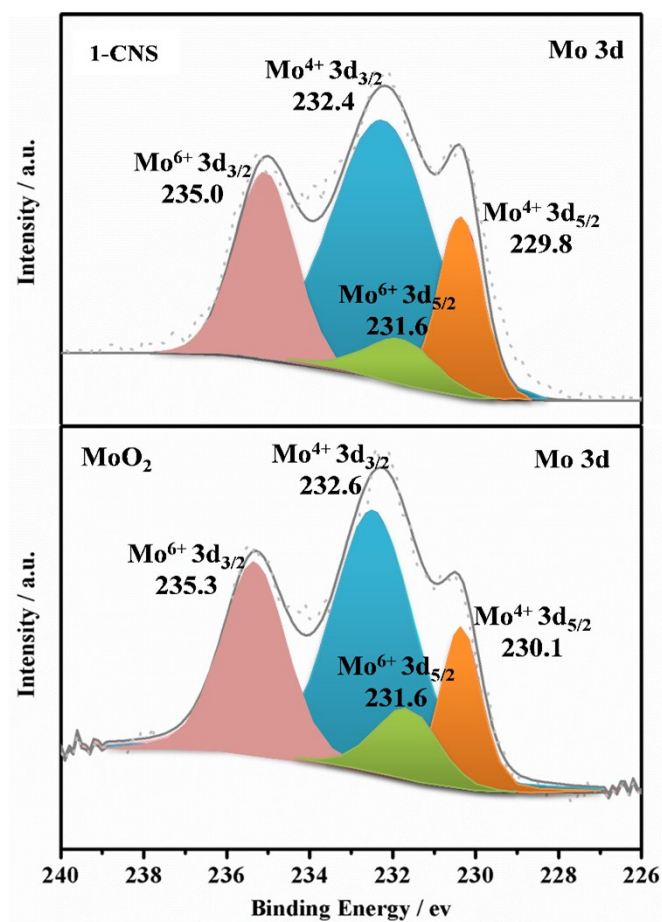


Fig. S7 XPS spectra of Mo 3d of 1-CNS and MoO<sub>2</sub>.

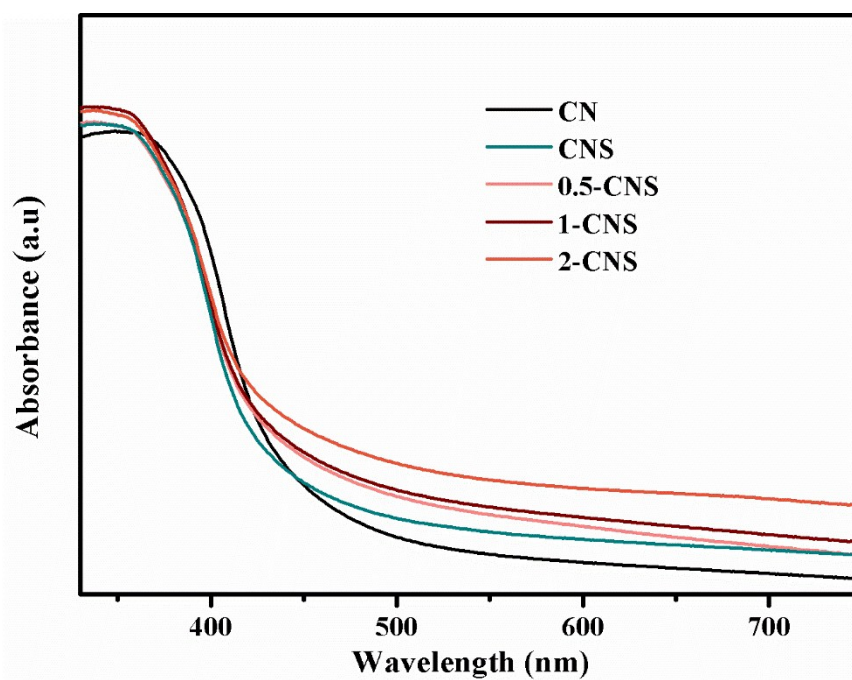


Fig. S8 UV-vis absorption spectra of CN, CNS, and different mass loading of MoO<sub>2</sub> on CNS.



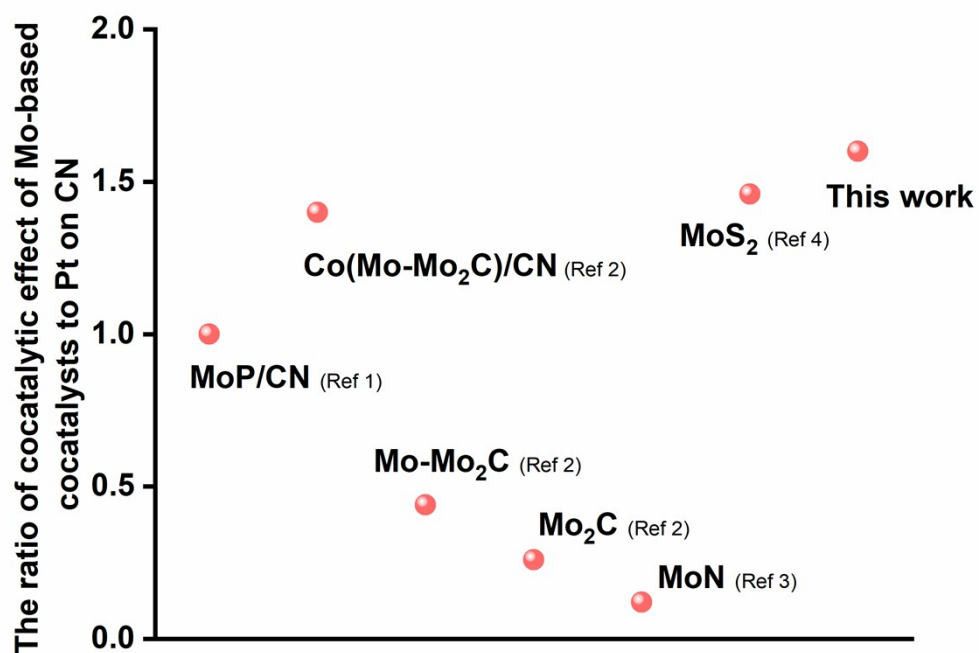


Fig. S9 The ratio of photocatalytic H<sub>2</sub> production performance of CN modified by Mo-based cocatalysts to Pt-CN.

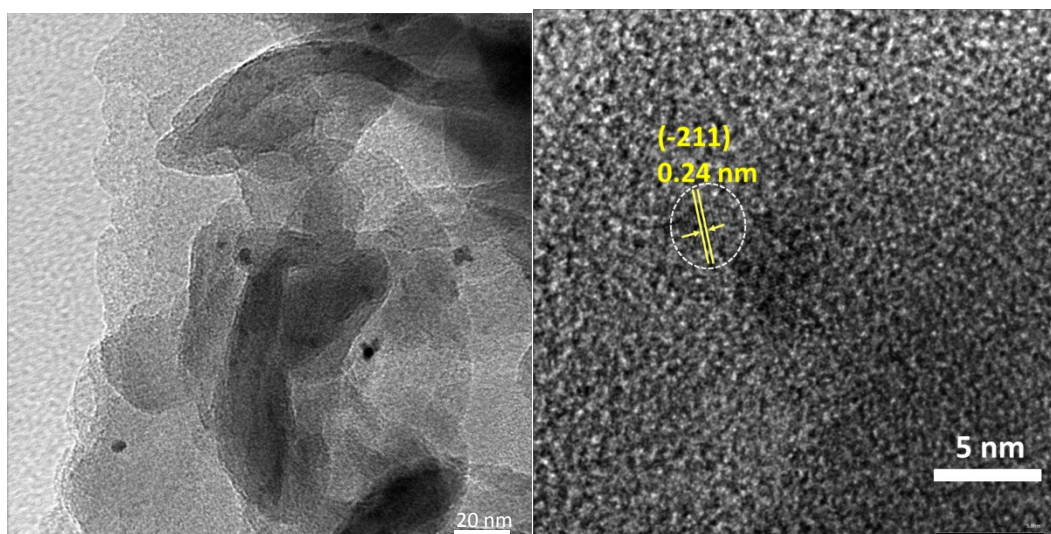


Fig. S10 TEM and HRTEM images of 1-CNS after photocatalytic H<sub>2</sub> production reaction.

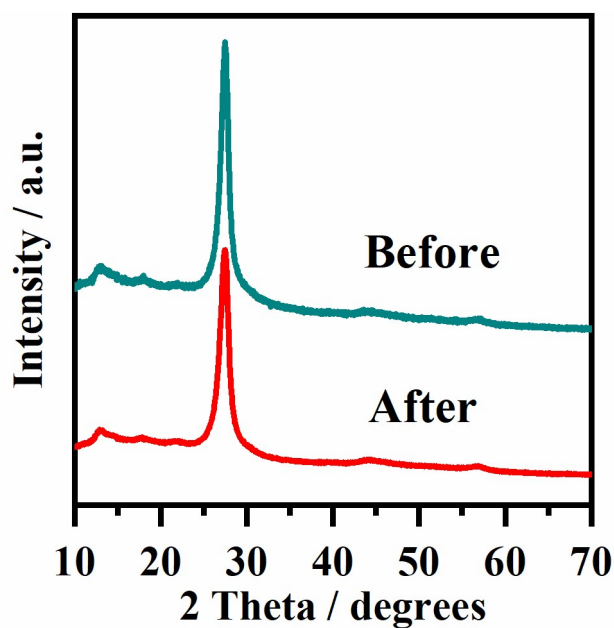


Fig. S11 XRD spectra of 1-CNS before and after photocatalytic reaction.

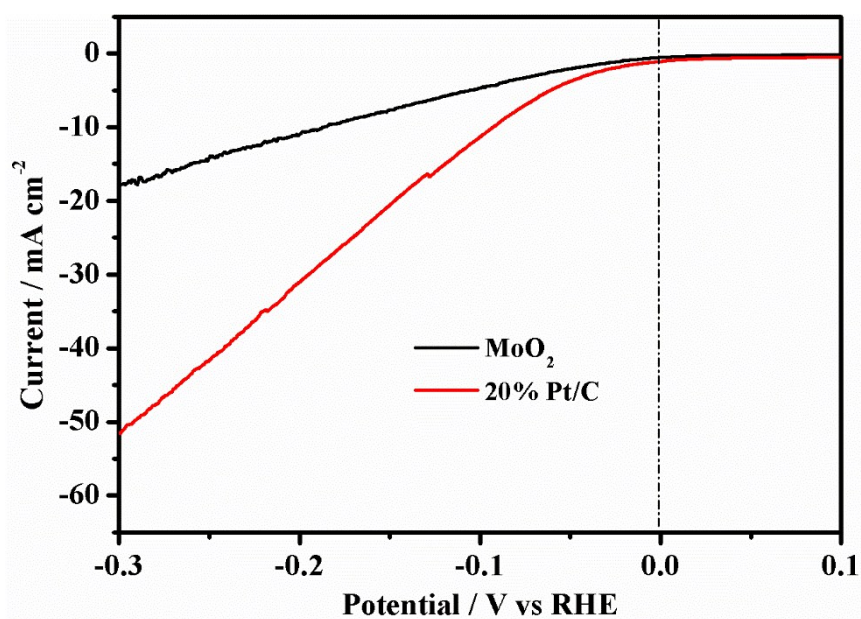


Fig. S12 LSV curves of MoO<sub>2</sub> and 20 wt% Pt/C in N<sub>2</sub>-saturated 1 M KOH solution.

## References

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- [2] Y. Zheng, J. Dong, C. Huang, L. Xia, Q. Wu, et al., *Appl. Catal. B*, 2020, **260**, 118220.

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