

Supplementary information

Constructing electron transfer pathways and active centers over $W_{18}O_{49}$ nanowires by doping Fe^{3+} and incorporating with g- C_3N_5 for enhanced photocatalytic nitrogen fixation

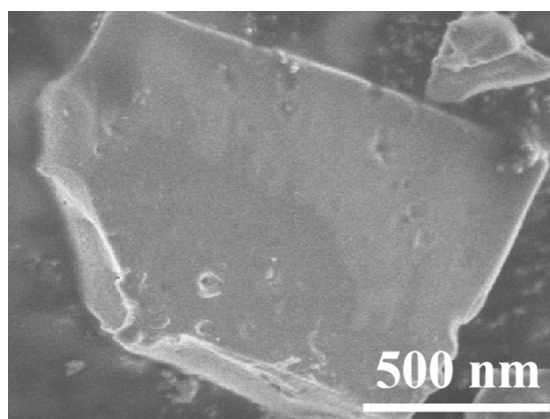


Fig. S1 SEM image of bulk g- C_3N_5 .

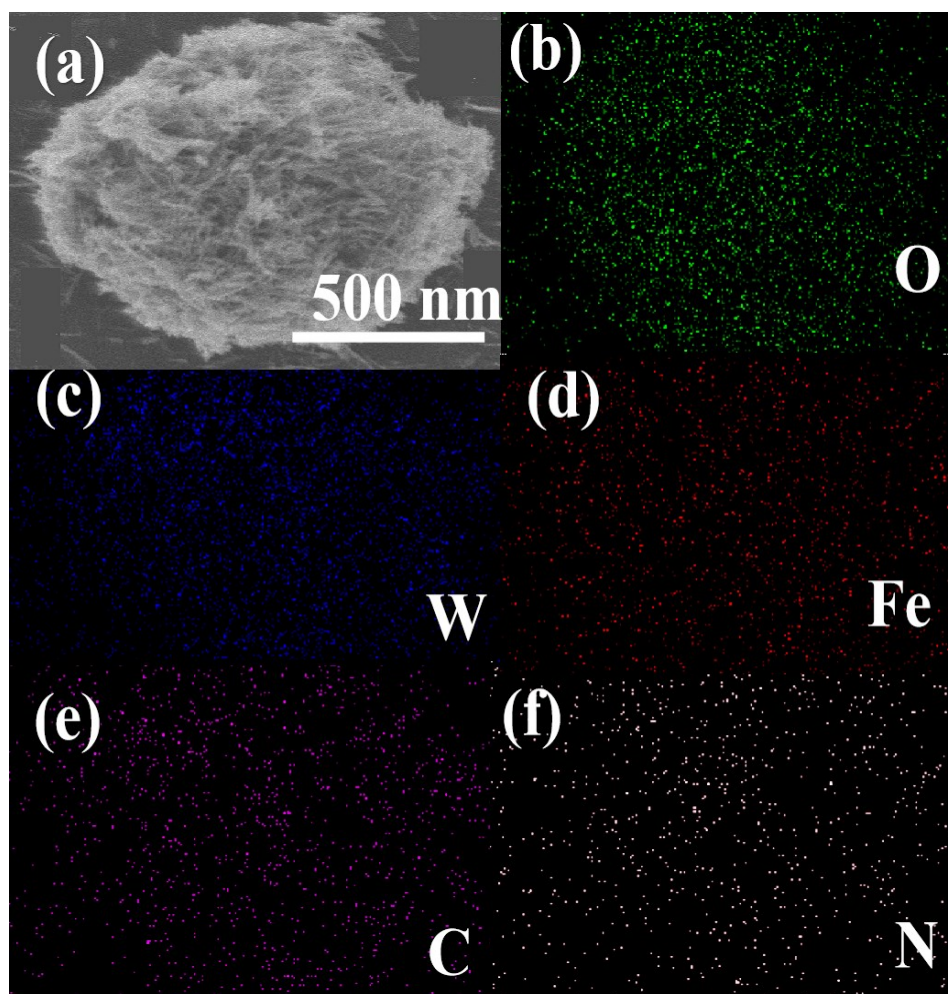


Fig. S2 (a) SEM images of Fe-W₁₈O₄₉/g-C₃N₅; (b)-(f) EDS mapping of Fe-W₁₈O₄₉/g-C₃N₅.

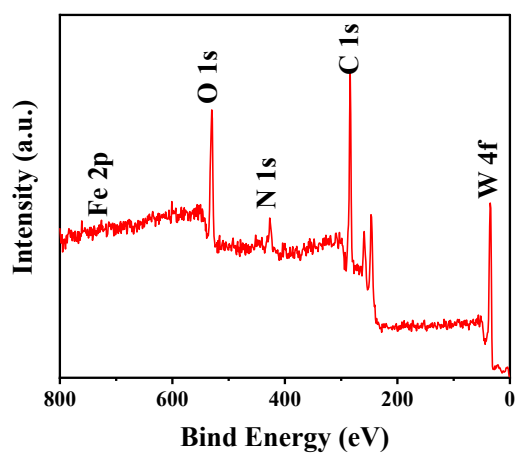


Fig. S3 XPS survey spectra of Fe-W₁₈O₄₉/g-C₃N₅.

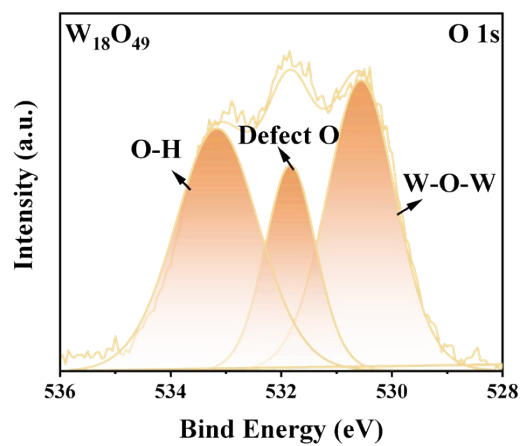


Fig. S4 High resolution XPS spectra for O 1s of W₁₈O₄₉.

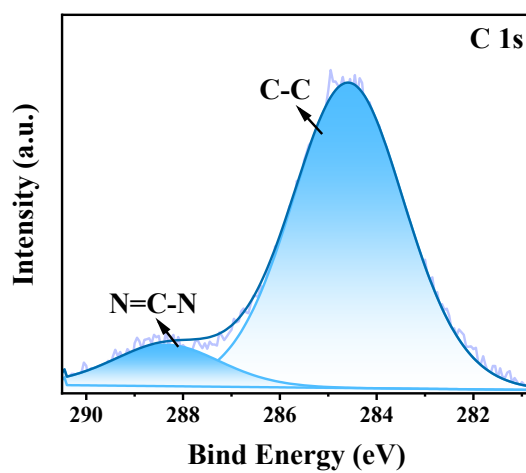


Fig. S5 High resolution XPS spectra for C 1s of Fe-W₁₈O₄₉/g-C₃N₅.

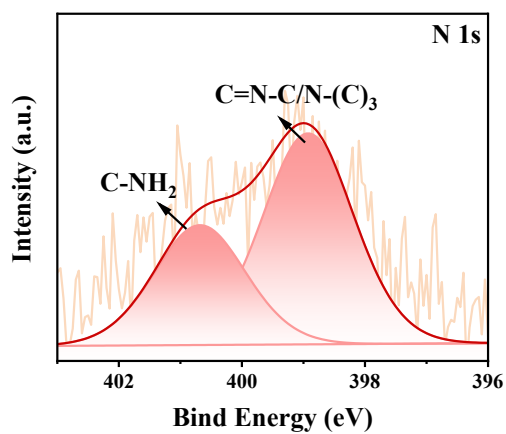


Fig. S6 High resolution XPS spectra for N 1s of Fe-W₁₈O₄₉/g-C₃N₅.

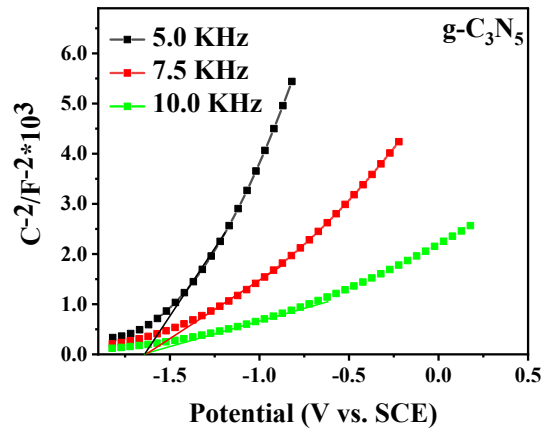


Fig. S7 Mott-Schottky curves of g-C₃N₅.

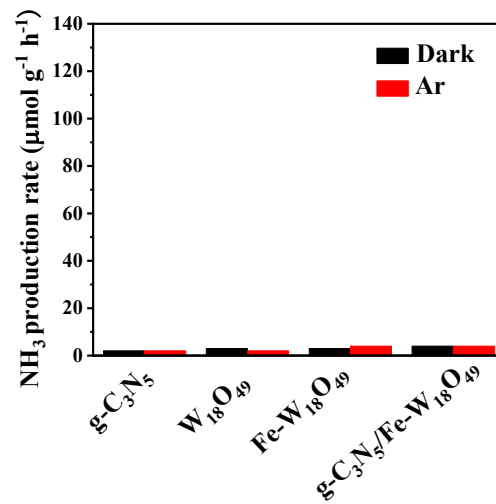


Fig. S8 NH₃ production rate of Fe-W₁₈O₄₉/g-C₃N₅ in the environment of N₂ and Ar, without light illumination and under full spectra.

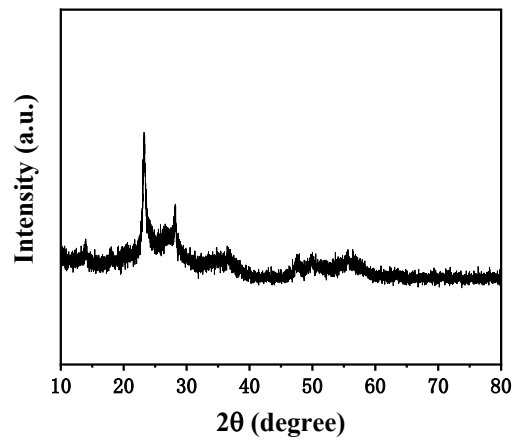


Fig. S9 XRD spectra of Fe-W₁₈O₄₉/g-C₃N₅ after photocatalytic nitrogen fixation.

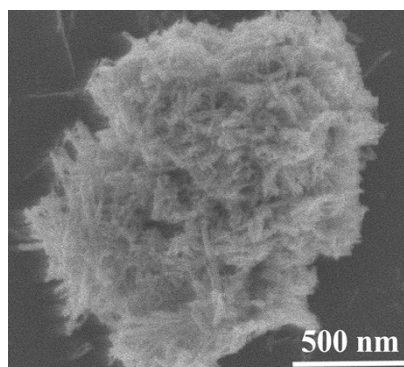


Fig. S10 SEM image of Fe-W₁₈O₄₉/g-C₃N₅ after photocatalytic nitrogen fixation.

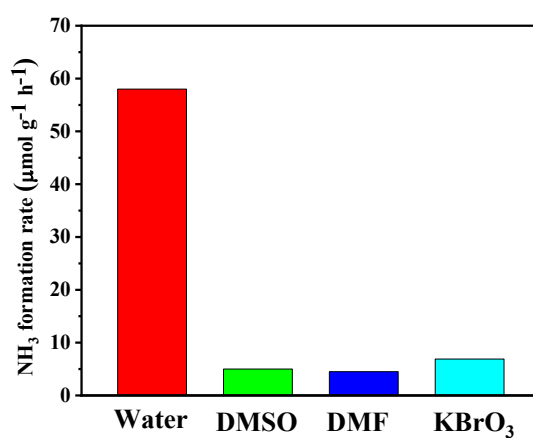


Fig. S11 NH₃ production rate of the Fe-W₁₈O₄₉/g-C₃N₅ in the existence of DMSO, DMF, and KBrO₃.

Table S1 Analysis consequence of element molar content in Fe-W₁₈O₄₉/g-C₃N₅ through EDX.

Element	W	O	Fe	C	N
Molar percentage (%)	16.63	51.10	0.86	18.96	12.45

Table S2 The control experiments of NH₃ formation rate of Fe-W₁₈O₄₉/g-C₃N₅ and Fe-W₁₈O₄₉&g-C₃N₅.

Nanocomposite	Fe-W ₁₈ O ₄₉ /g-C ₃ N ₅	Fe-W ₁₈ O ₄₉ &g-C ₃ N ₅
NH ₃ production rate	131.6 μmol g ⁻¹ h ⁻¹	86.3 μmol g ⁻¹ h ⁻¹