Supporting Information

Near-infrared-activated $NaYF_4:Yb^{3+},Tm^{3+}$@g-C_3N_4@WO_3@MXene photocatalytic system for enhanced removal of tetracycline antibiotics

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Supporting Figures:

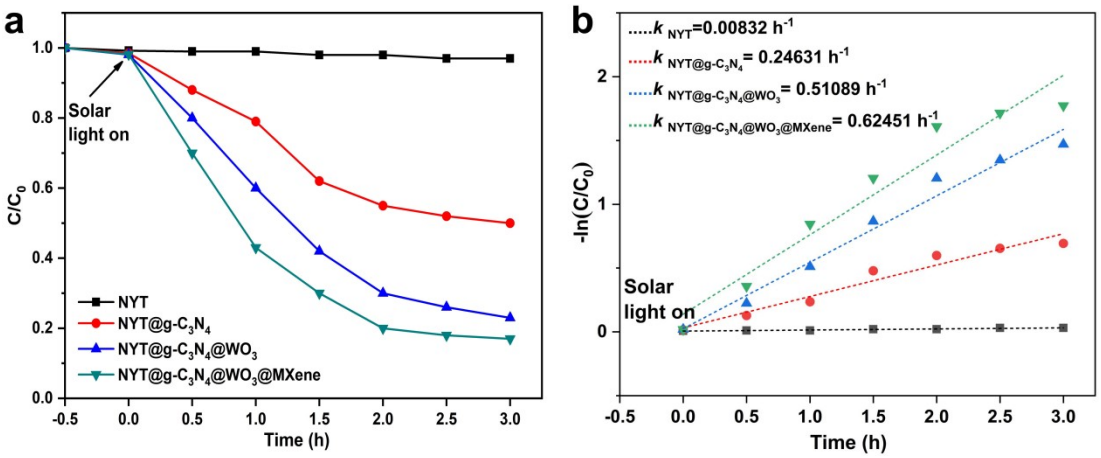

Fig. S1 Photodegradation of TC (a) and the corresponding degradation rate constant (b) over different photocatalysts under simulated solar light.

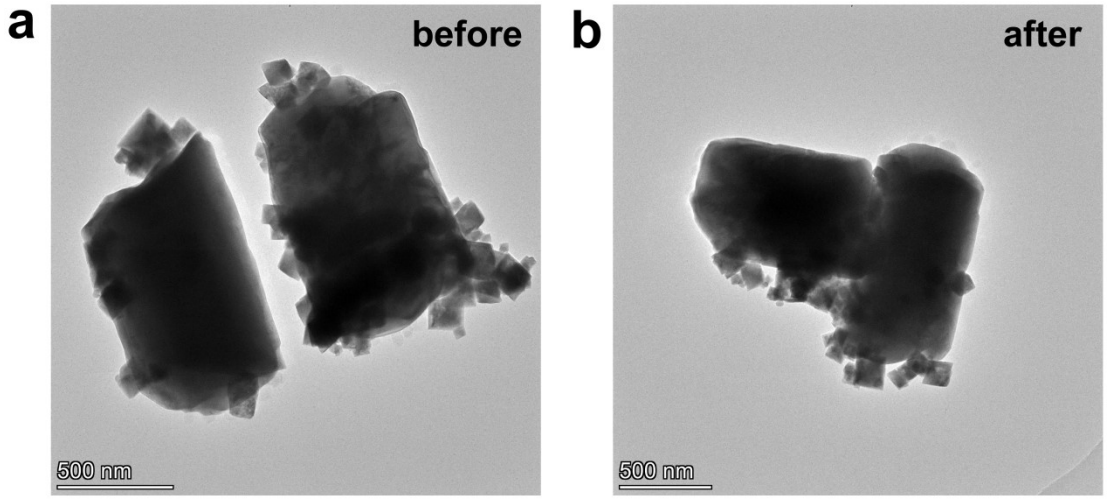

Fig. S2 TEM images of NYT@g-C_3N_4@WO_3@MXene (a) before and (b) after cycle experiments of photodegradation of TC under NIR light radiation.

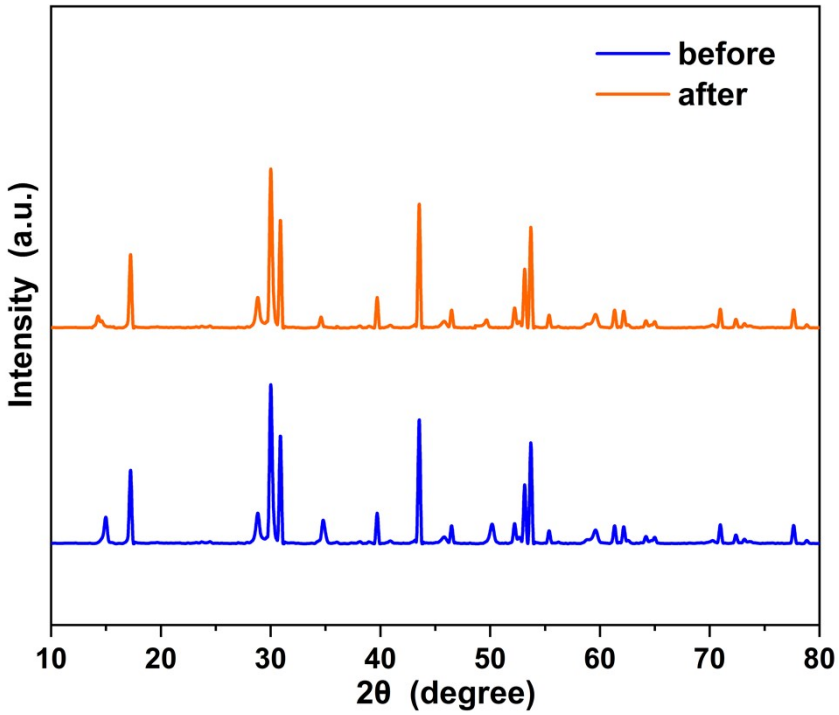

Fig. S3 XRD patterns of NYT@g-C_3N_4@WO_3@MXene before and after cycle experiments of photodegradation of TC under NIR light radiation.

Supporting Tables:

Table S1 The elements analysis of NYT@g-C_3N_4@WO_3@MXene by the EDS analysis.

Element	Atomic fraction (%)	Mass fraction (%)
C	3.53	1.1
N	1.28	0.47
O	8.99	3.75
F	51.77	25.64
Na	15.68	9.4
Ti	0.61	0.76
Y	10.39	24.08
Tm	4.57	20.13
Yb	2.09	9.42
W	1.09	5.25

Table S2 Comparison of photocatalytic performance of NIR-driven photocatalysts for the removal of tetracycline pollutants.

Catalyst	Pollutant	Light source	Operating conditions	Degradation rate (%)/time (h or min)	Ref.
$NaGdF_4:Yb^{3+}/Er^{3+}@Bi_4O_5I_2/Bi_5O_7I$	tetracycline hydrochloride	λ≧800 nm	Initial concentration: 5 mg L^{-1} Catalyst dosage: 200 mg L^{-1}	28.47%/3 h	**J. Alloys Compd. 2024, 1002, 175473.**
ZIF-67/Ag NPs /$NaYF_4$:Yb,Er	sulphonamide antibiotic	500W Xe lamp	Initial concentration: 10 mg L^{-1} Catalyst dosage: 500 mg L^{-1}	95.4%/3 h	**Small 2024, 20, 2309972.**
$NaYF_4$:Yb,Tm@TiO_2-Acetylacetone	tetracycline	Full-spectrum	Initial concentration: 10 mg L^{-1} Catalyst dosage: 200 mg L^{-1}	79.8%/6 h	**Int. J. Mol. Sci. 2023, 24, 9441.**
$BiVO_4$:Er/Yb@Ag/Ag_3PO_4	tetracycline hydrochloride	980 nm laser 2 W	Initial concentration: 10 mg L^{-1} Catalyst dosage: 1000 mg L^{-1}	69.5%/9 h	**Ceram. Int. 2023, 49, 26589-26603.**
Tm@Yb@Y/NMF(2:1)	tetracycline hydrochloride	300 W Xe lamp, λ＞200 nm	Initial concentration: 20 mg L^{-1} Catalyst dosage: 500 mg L^{-1}	47%/150 min	**Cryst. Growth Des. 2022, 22, 4864-4873.**
BiOBr/$BiVO_4$:Yb^{3+},Er^{3+}	tetracycline hydrochloride	980 nm laser 2 W	Initial concentration: 10 mg L^{-1} Catalyst dosage: 1000 mg L^{-1}	72.3%/12 h	**J. Alloys Compd. 2022, 929, 167330.**
NYT@g-C_3N_4@WO_3@MXene	tetracycline	300 W Xe lamp, λ＞800 nm	Initial concentration: 10 mg L^{-1} Catalyst dosage: 500 mg L^{-1}	86.3%/12 h	**this work**