Supplementary Information

Composites of YF_3: Yb^{3+}, Er^{3+}, Tm^{3+}@C_3N_4-Au with near-infrared light-driven ability for photocatalytic wastewater purification

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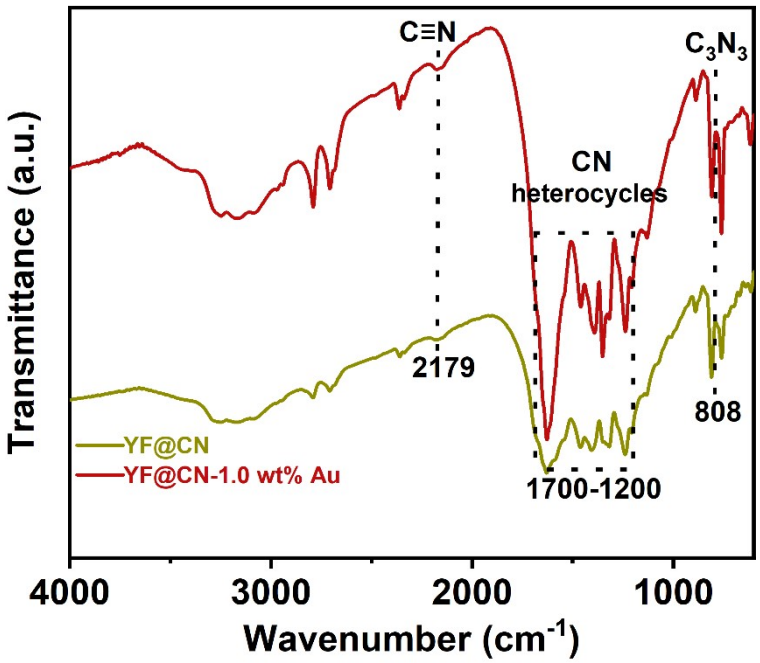

Figure S1. FT-IR spectrum of YF@CN and YF@CN-1.0 wt% Au.

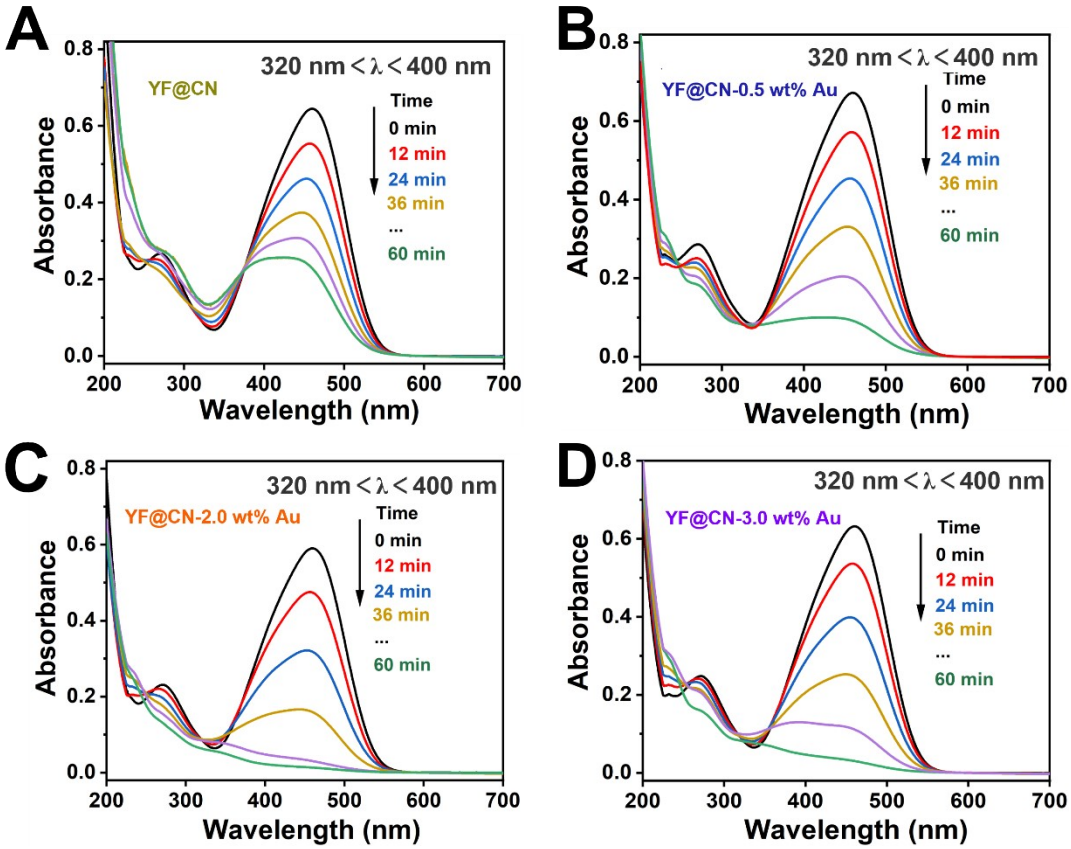

Figure S2. The absorption spectra of MO photodegradation for various mass fractions of Au after different irradiation times under UV light (320 nm< λ < 400 nm) irradiation are presented as follows: (A) YF@CN, (B) YF@CN-0.5 wt% Au, (C) YF@CN-2.0 wt% Au and (D) YF@CN-3.0 wt% Au.

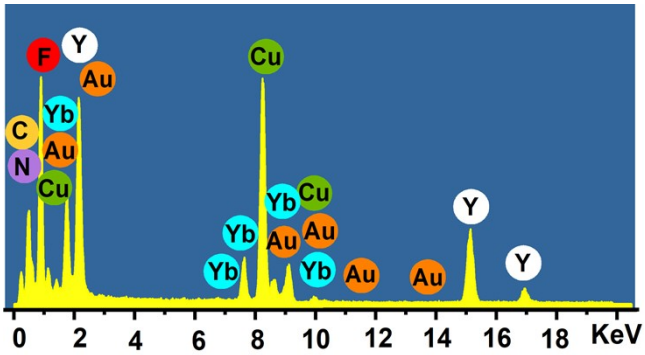

Figure S3. EDX spectrum of YF@CN-1.0 wt%Au after 40 consecutive cycles under UV light (320 nm< λ < 400 nm) irradiation.

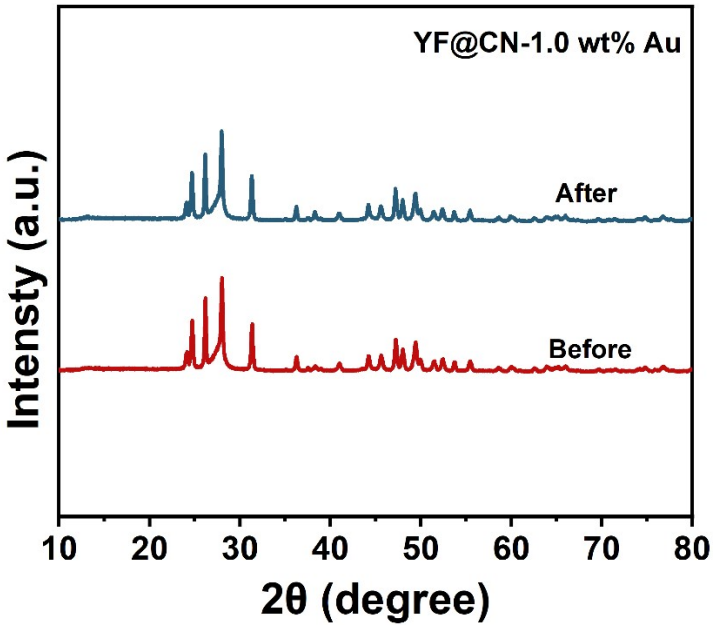

Figure S4. XRD patterns of YF@CN-1.0 wt%Au before and after 40 consecutive cycles under UV light (320 nm< λ < 400 nm) irradiation.

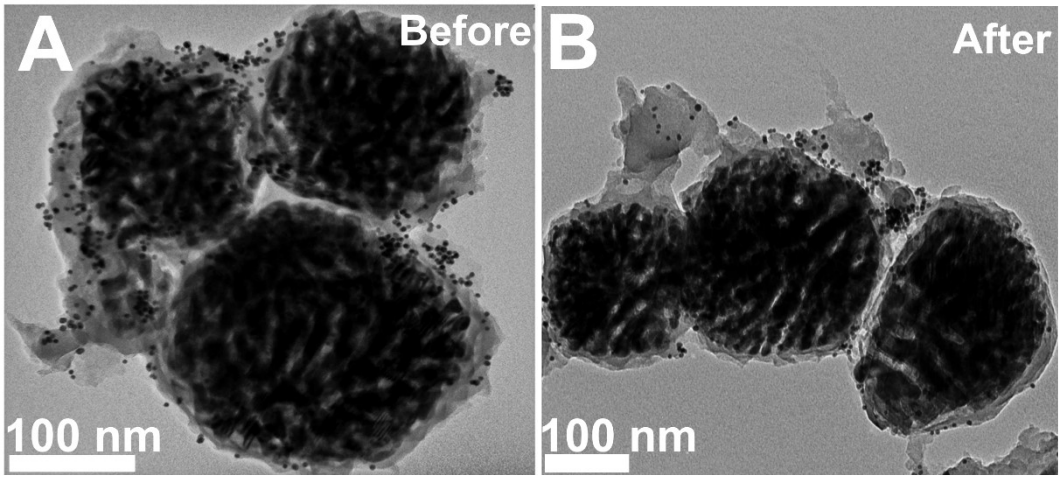

Figure S5. TEM images of YF@CN-1.0 wt%Au before (A) and after (B) 40 consecutive cycles under UV light (320 nm< λ < 400 nm) irradiation.

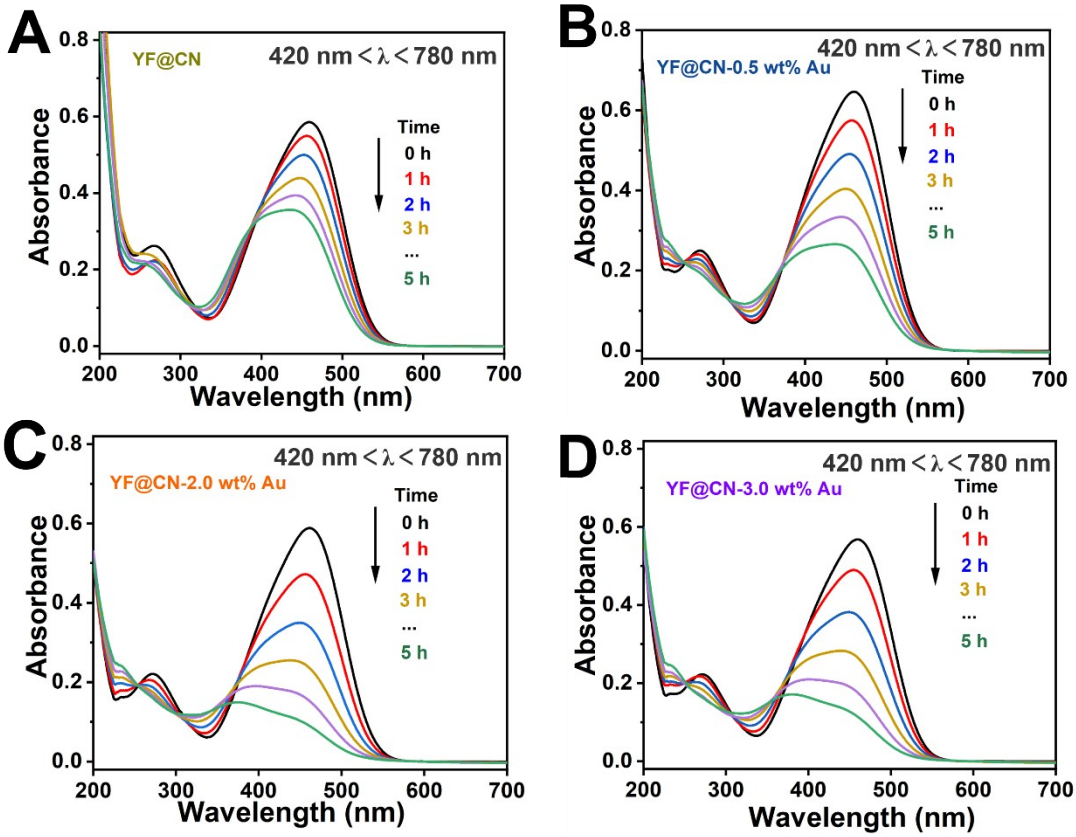

Figure S6. The absorption spectra of MO photodegradation for various mass fractions of Au after different irradiation times under visible light (420 nm< **λ** < 780 nm) irradiation are presented as follows: (A) YF@CN, (B) YF@CN-0.5 wt% Au, (C) YF@CN-2.0 wt% Au and (D) YF@CN-3.0 wt% Au.

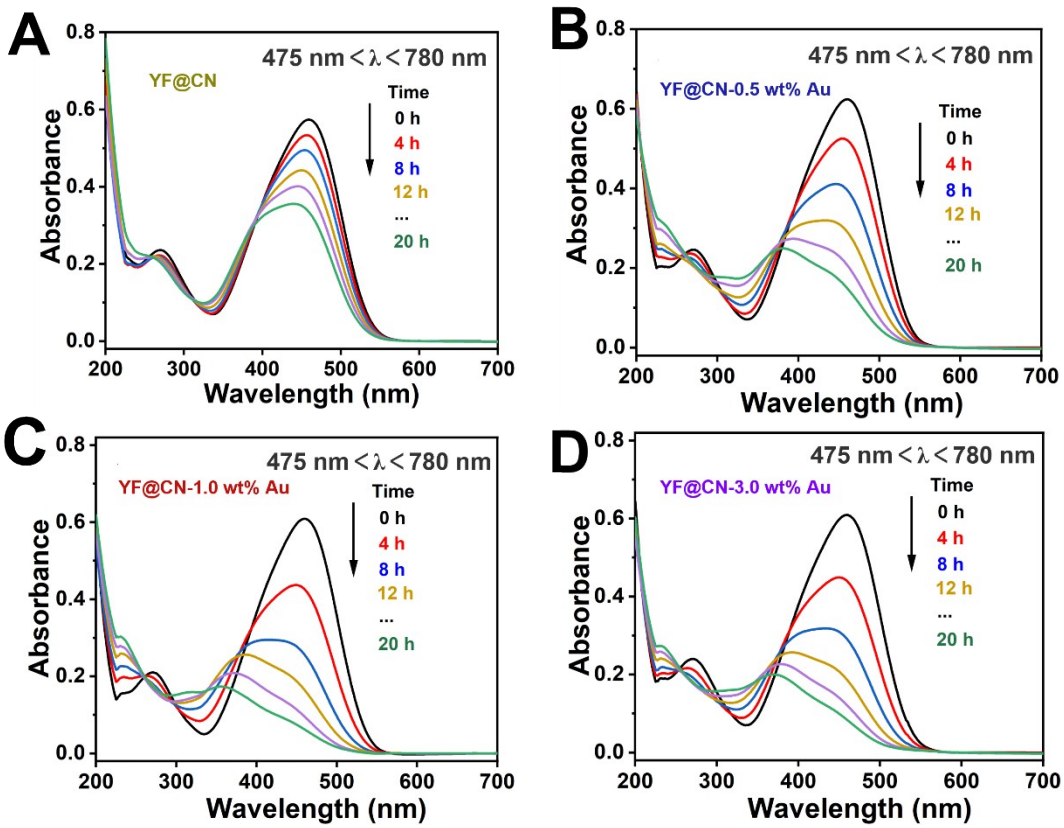

Figure S7. The absorption spectra of MO photodegradation for various mass fractions of Au after different irradiation times under visible light (475 nm< **λ** < 780 nm) irradiation are presented as follows: (A) YF@CN, (B) YF@CN-0.5 wt% Au, (C) YF@CN-1.0 wt% Au and (D) YF@CN-3.0 wt% Au.

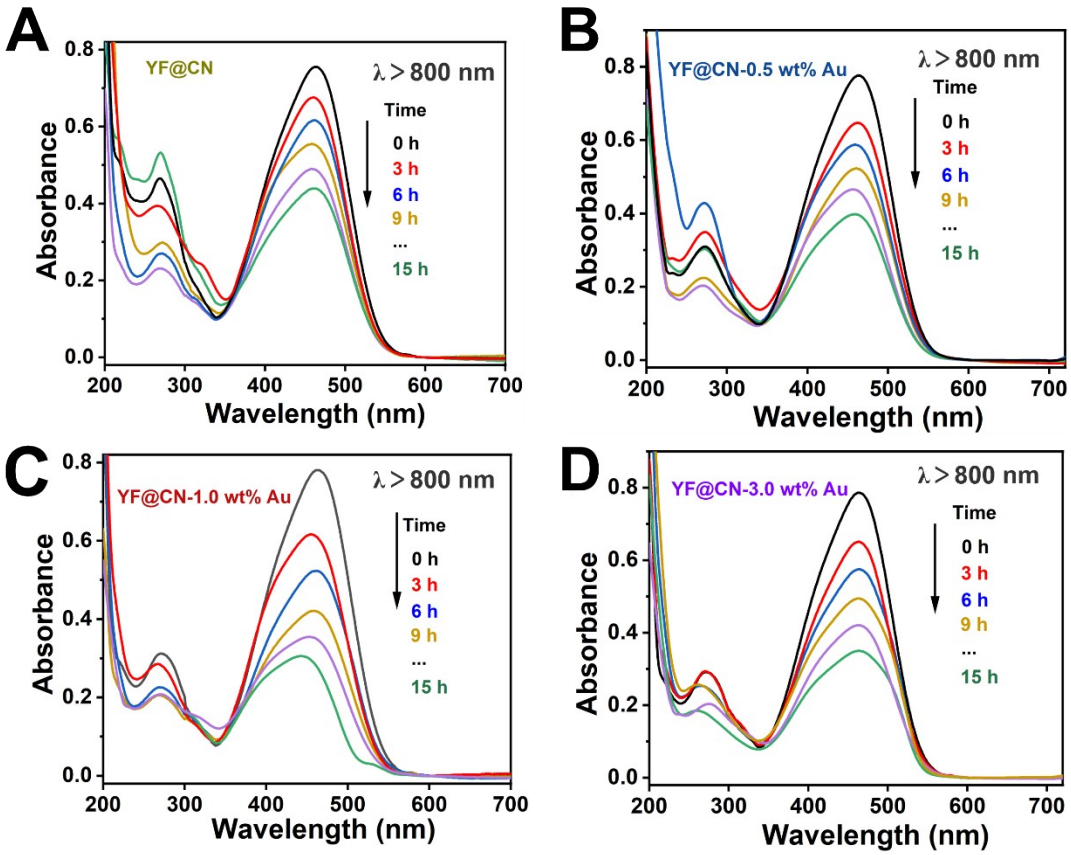

Figure S8. The absorption spectra of MO photodegradation for various mass fractions of Au after different irradiation times under NIR light (λ > 800 nm) irradiation are presented as follows: (A) YF@CN, (B) YF@CN-0.5 wt% Au, (C) YF@CN-1.0 wt% Au and (D) YF@CN-3.0 wt% Au.