

Supporting Information (SI)

In Situ Synthesis of Mesoporous TiO₂ Nanofibers Surface-Decorated with AuAg Alloy Nanoparticles Anchored by Heterojunction Exhibiting Enhanced Solar Active Photocatalysis

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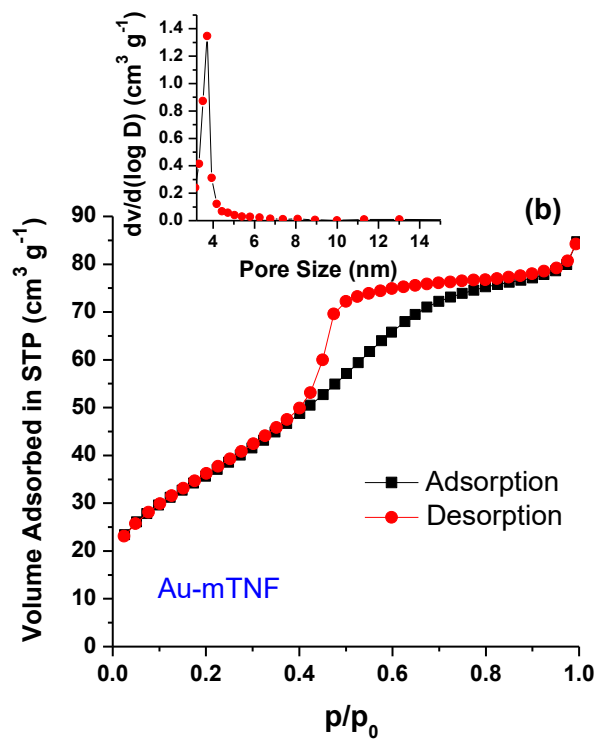
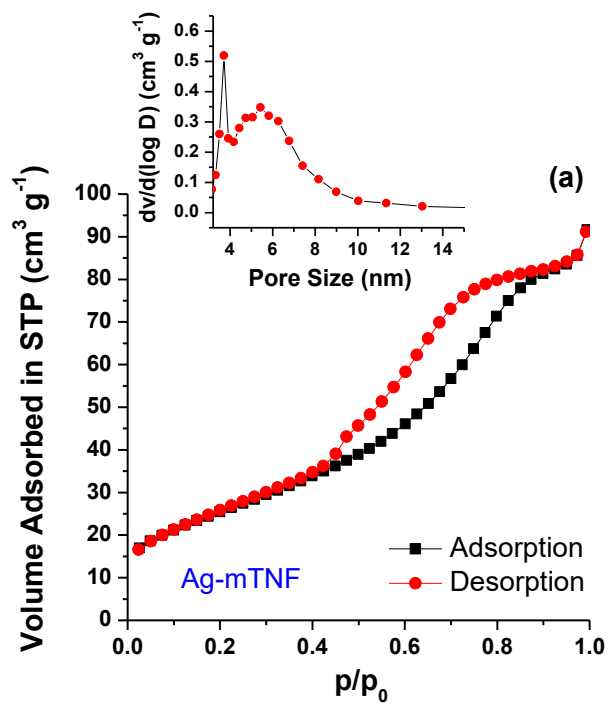


Figure S1. N_2 sorption analysis of Ag-mTNF (a) and Au-mTNF (b) samples. Insets show the respective pore size distributions.

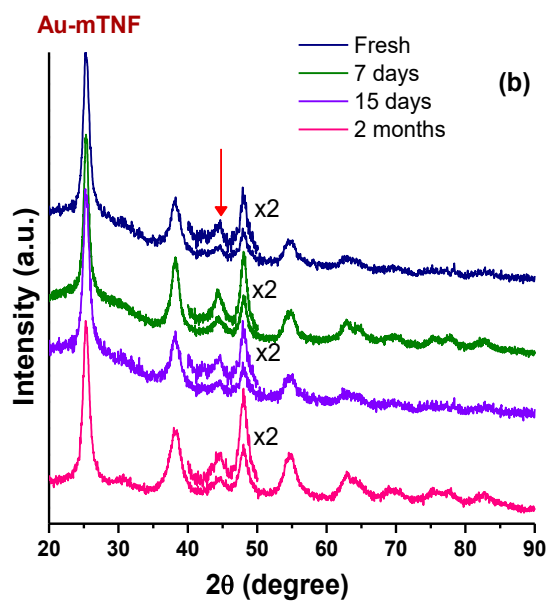
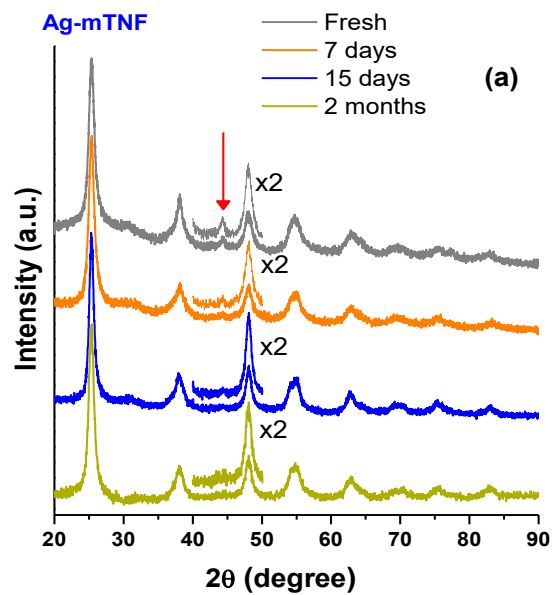


Figure S2. XRD patterns of Ag-mTNF (a) and Au-mTNF (b) acquired after time intervals up to 2 months to check the stability of the samples. Y-axis is normalized with respect to the TiO₂ (101) peak. Ag(200) and Au(200) peaks are marked by red arrow in the respective figures.

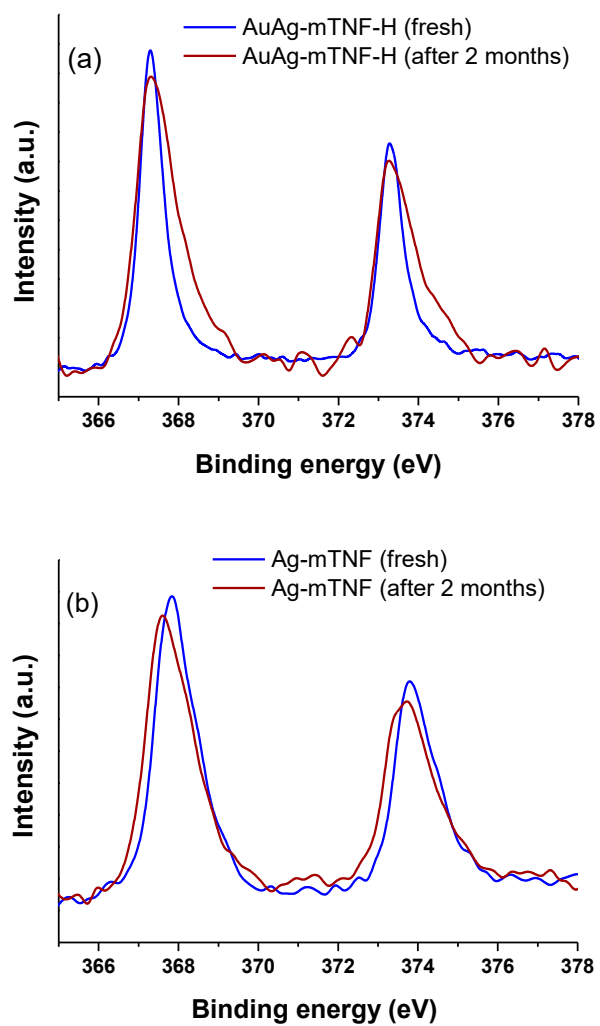


Figure S3. Ag_{3d} high resolution XPS analysis of fresh and 2 months aged AuAg-mTNF-H (a) and Ag-mTNF (b) samples. XPS of fresh samples were taken after about 1 day of preparation.

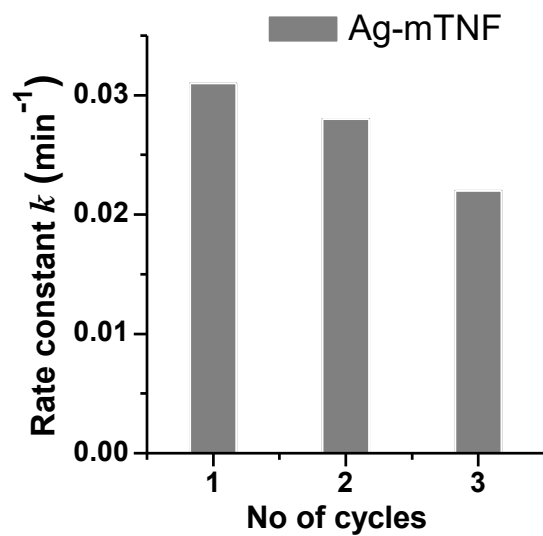


Figure S4. Plots of rate constant (k) values for MB dye degradation using the freshly prepared Ag-mTNF sample in 3 consecutive cycles under simulated solar light (1 Sun) following the same experimental conditions as given in **section 2.4** in the main manuscript. The results show about 10 and 30% drop in the k values during the second and third cycle, respectively.

Table S1. Comparative study of H₂ evolution rates using different TiO₂ based photocatalysts

Entry no.	Photocatalyst	reacting mixture	H ₂ production rate ($\mu\text{mol h}^{-1} \text{g}^{-1}$)	Light source	^a Ref.
1	Au-TiO ₂ composite	water: methanol (90:10 vol)	470 $\mu\text{mol h}^{-1} \text{g}^{-1}$	UV-A light source; 30 mW cm ⁻²	49
2	Au-P25 TiO ₂	Water:ethanol (20:1)	846 $\mu\text{mol h}^{-1} \text{g}^{-1}$	450W high pressure Hg lamp	53
3	TiO ₂	water: methanol (80:20 vol)	667.2 $\mu\text{mol h}^{-1} \text{g}^{-1}$	300W Xe lamp (UV light irradiation)	50
4		water: triethanolamine (80:20 vol)	18 $\mu\text{mol h}^{-1} \text{g}^{-1}$		
5	Pt loaded TiO ₂ /C ₃ N ₄	water: triethanolamine (90:10 vol)	770 $\mu\text{mol h}^{-1} \text{g}^{-1}$	150W Xe lamp ($\lambda=200-2500$ nm)	51
6	Au NPs incorporated TiO ₂ bowl	water	323 $\mu\text{mol h}^{-1} \text{g}^{-1}$	300W Xe lamp (2.7 mW cm ⁻² UV and 100 mW cm ⁻² visible light)	17
7	Ag-TiO ₂ nanofiber	water: methanol (50:50 vol)	3133 $\mu\text{mol h}^{-1} \text{g}^{-1}$	300W Xe lamp	47
8	Au-TiO ₂	pure water	3.25 $\mu\text{mol h}^{-1} \text{g}^{-1}$	300W Xe lamp	20
9	Pt loaded TiO ₂ /MWCNT	water: triethanolamine (85:15 vol)	235 $\mu\text{mol h}^{-1} \text{g}^{-1}$	250W Xe lamp with cutoff $\lambda > 420$ nm (visible light)	52
	Pt loaded TiO ₂		0		
10	Au-TiO ₂	0.1 M L-ascorbic acid solution (pH=6)	57.02 $\mu\text{mol h}^{-1} \text{g}^{-1}$	300W Xe lamp	54
11	Janus Au-TiO ₂ nanostructure	water: isopropanol (2:1 vol)	2 ml h ⁻¹ ($2 \times 10^{-3} \mu\text{mol h}^{-1} \text{g}^{-1}$)	500W tungsten lamp ($\lambda > 400$ nm)	21

12	2.2 wt% Au-TiO ₂ [h]* aerogels *h=high concentration of Ti(ⁱ OPr) ₄ .	4:1 (v/v) 0.1 M NaOH/methanol solution containing 0.02 M ethylenediaminetetraacetic acid.	1750 μmol h ⁻¹ g ⁻¹	500W Xe arc lamp with AM 1.5 filter.	16
13	Pt _{0.5} -Au ₁ /TiO ₂	water: methanol (70:30 vol)	1275 μmol h ⁻¹ g ⁻¹	AM1.5G 100 mW cm ⁻²	18
14	Ag _{0.5} -Au ₁ /TiO ₂		466 μmol h ⁻¹ g ⁻¹		
15	Ag on Au-TiO ₂ composite	water: methanol (75:25 vol)	718 μmol h ⁻¹ g ⁻¹	AM1.5G 100 mW cm ⁻²	34
16	Pt loaded mesoporous TiO ₂	water: methanol (80:20 vol)	810 μmol h ⁻¹ g ⁻¹	AM1.5G 100 mW cm ⁻²	48
17	AuAg-mTNF-H	water: triethanol amine (90:10 vol)	516 μmol h ⁻¹ g ⁻¹	AM1.5G 60 mW cm ⁻²	this work
	Au-mTNF		200 μmol h ⁻¹ g ⁻¹		

^a Please see main article for references.