Nano-MOF@Defected Film C_3N_4 Z-scheme Composite for Visible-light Photocatalytic Nitrogen Fixation

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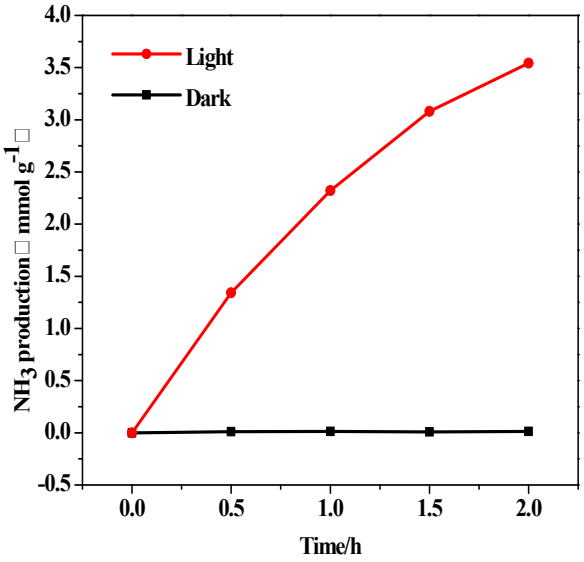


Figure S1. Photocatalytic nitrogen fixation activity for MOF@DF-C_3N_4 under light irradiation and no light irradiation .

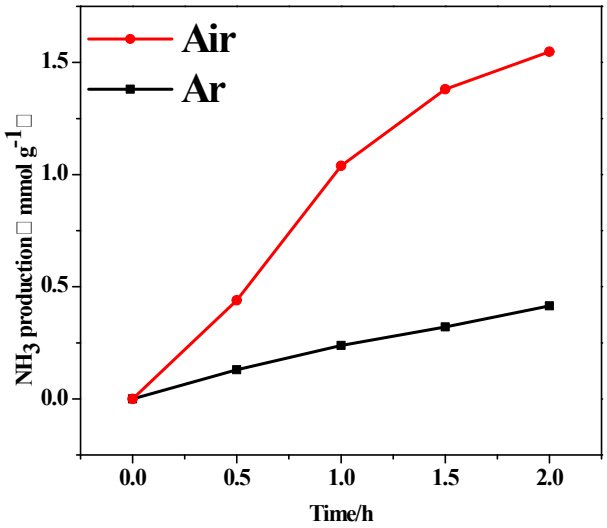


Figure S2. Visible light photocatalytic nitrogen fixation activity for DF-C_3N_4 under Ar and air.

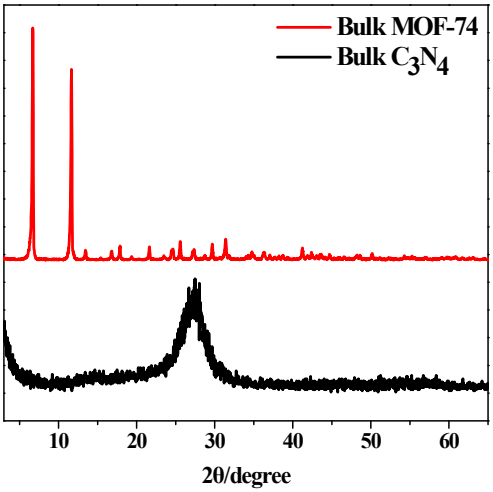


Figure S3. X-ray diffraction patterns of bulk MOF-74 and bulk-C_3N_4.

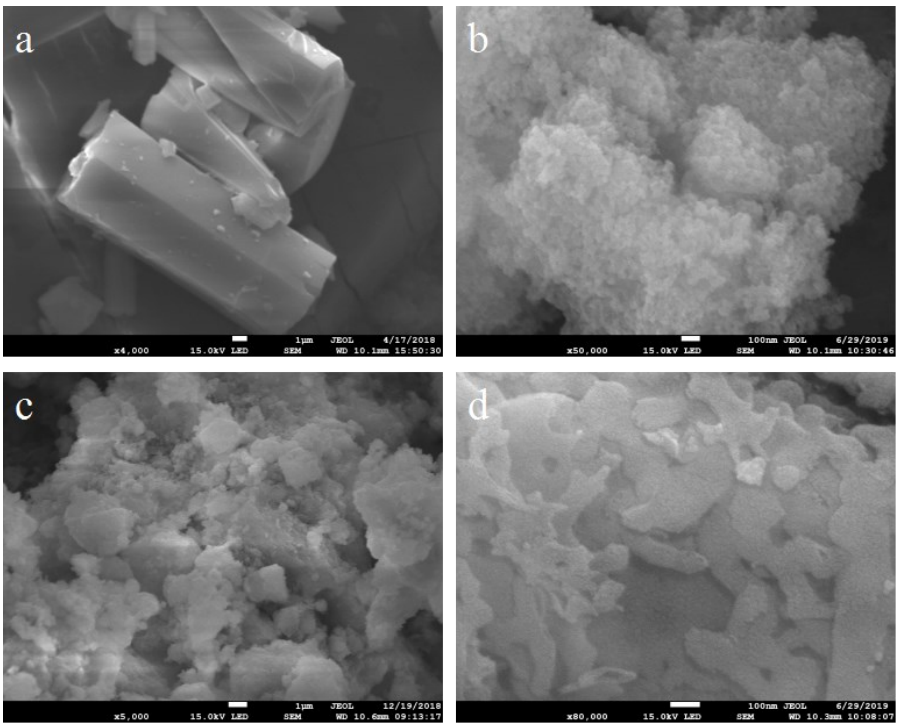


Figure S4. SEM images of bulk Zn-MOF-74(a), Nano-MOF-74(b), Bulk-C_3N_4(c) and DF-C_3N_4(d).

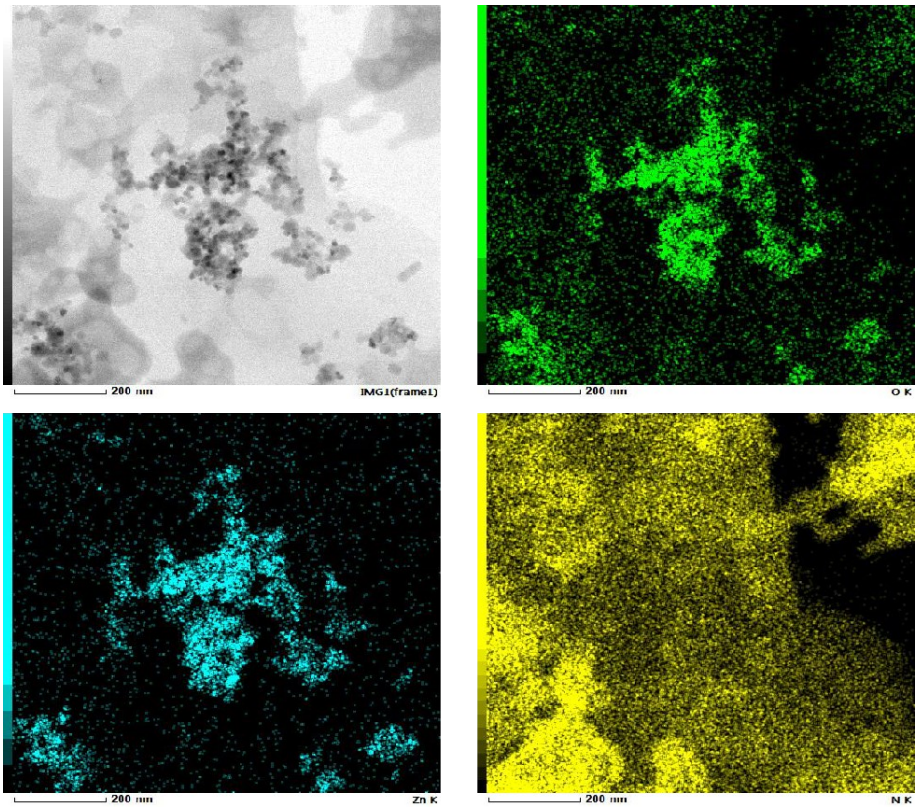


Figure S5. TEM element mapping images for Nano-MOF-74@Film-C_3N_4.

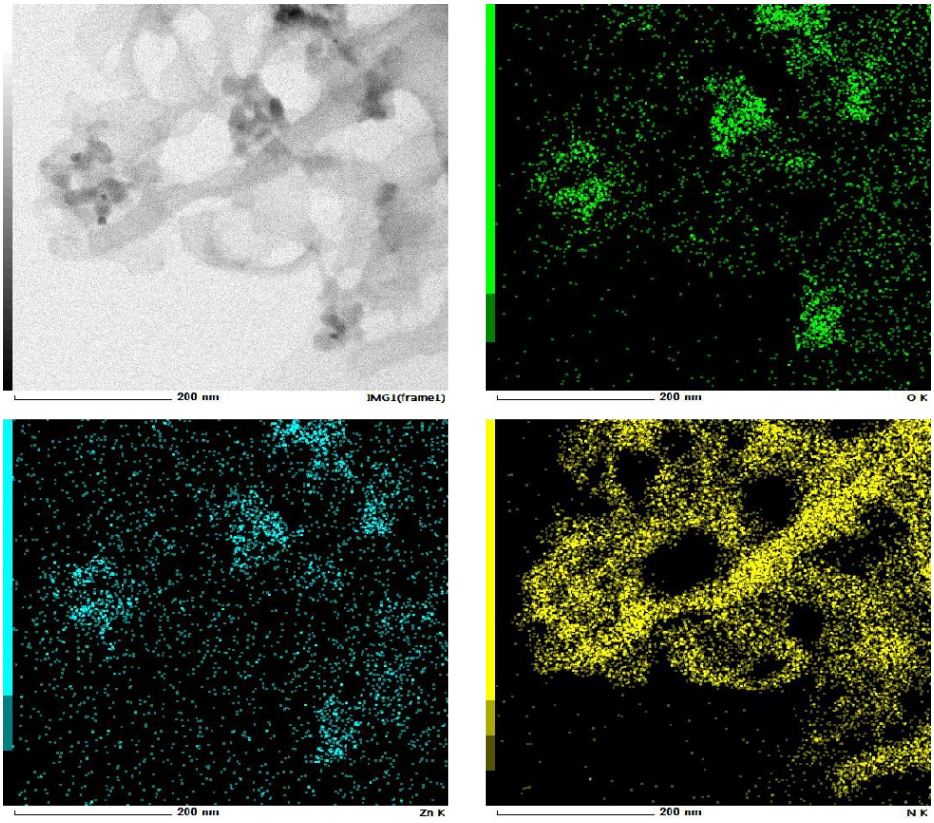


Figure S6. TEM element mapping images for Nano-MOF-74@DF-C_3N_4.

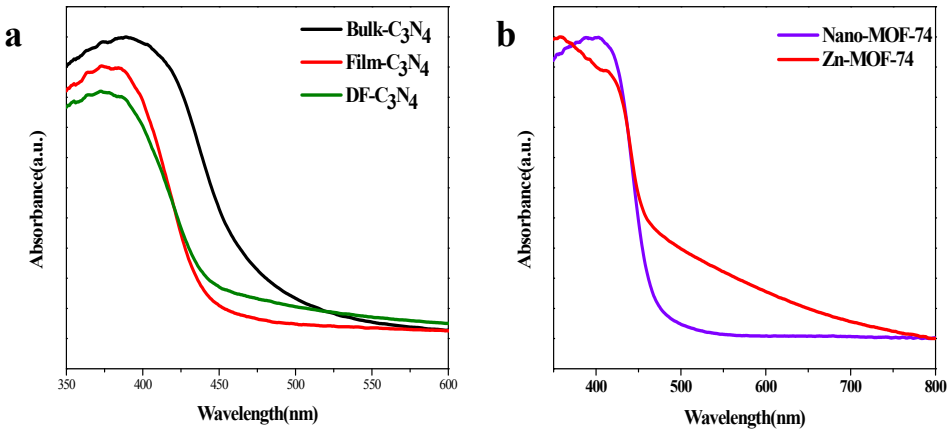


Figure S7. (a)UV-vis light absorption spectra of Bulk-C_3N_4,Film-C_3N_4 and DF-C_3N_4,(b)Nano-MOF-74 and Zn-MOF-74.

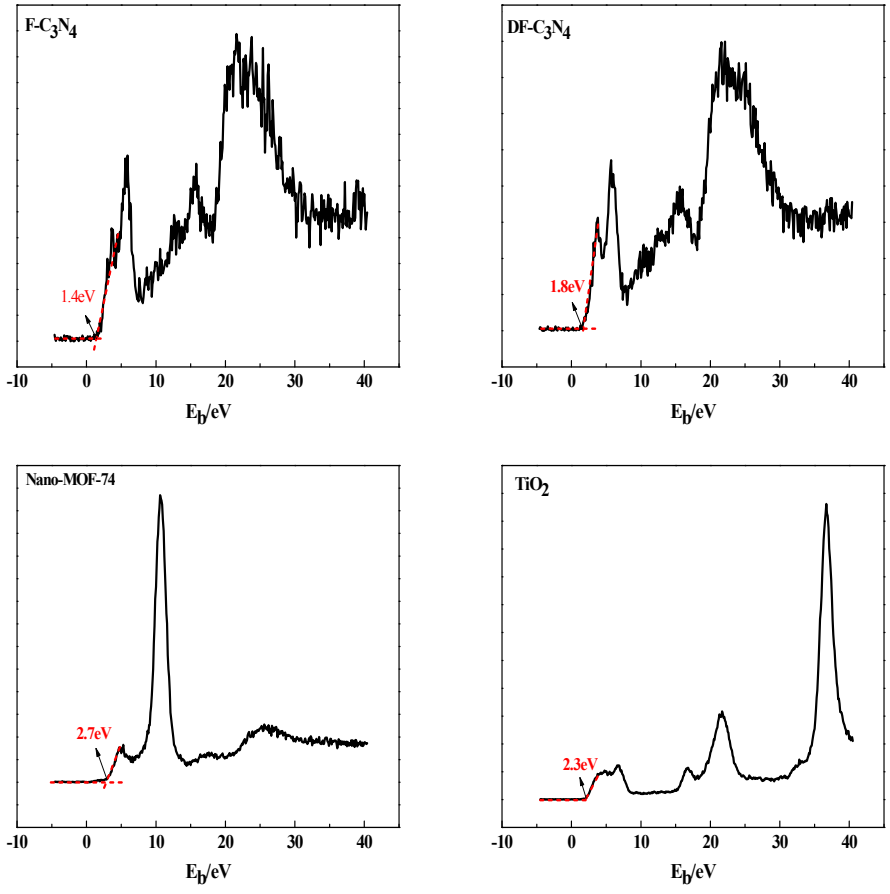


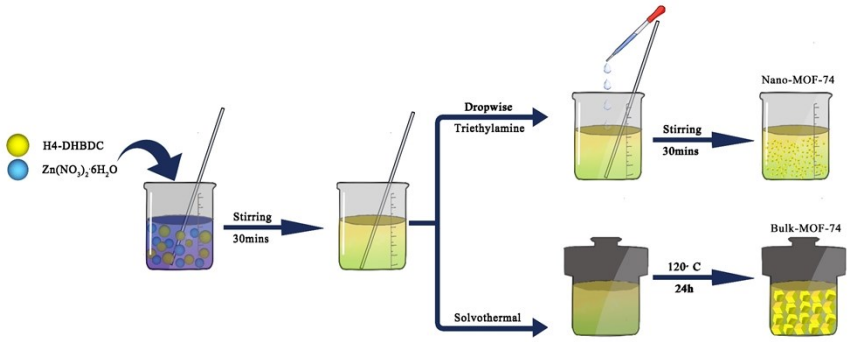
Figure S8. Valence band XPS spectra of F-C_3N_4(a),DF-C_3N_4(b),Nano-MOF-74(c) and TiO_2(d).

The valence band position of TiO_2 (vs.NHE) is 3.0eV, and the actual measured valence band position is 2.3eV, so the valence band position of F-C_3N_4,DF-C_3N_4 and

Nano-MOF-74 should be modified by adding 0.7eV. The valence band position of F-C_3N_4, DF-C_3N_4 and Nano-MOF-74 should be 2.1eV, 2.5eV and 3.4eV.

Table S1. The absolute nitrogen concentration of different photocatalysts obtained from Elemental Analysis.

Sample	Mass Ratio	
	N%	C%
Bulk-C_3N_4	**60.43**	**34.36**
F-C_3N_4	**58.84**	**33.56**
DF-C_3N_4	**57.95**	**33.93**



Scheme S1. The difference between the synthesis method of Nano-MOF-74 and the conventional procedure.

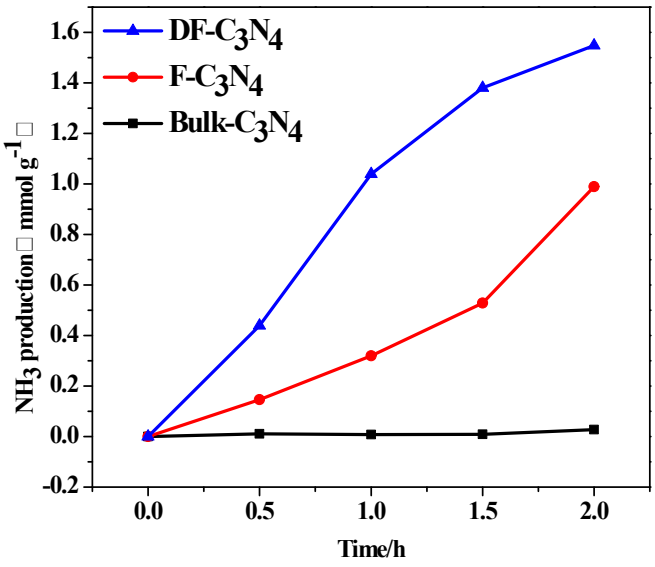


Figure S9. Photocatalytic nitrogen fixation activity for DF-C_3N_4, F-C_3N_4 and Bulk-C_3N_4.