Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information for:

NTCDA/*g*-C_3N_4 Van der Waal heterojunctions exhibit enhanced photochemical H_2O_2 production and antimicrobial activity.

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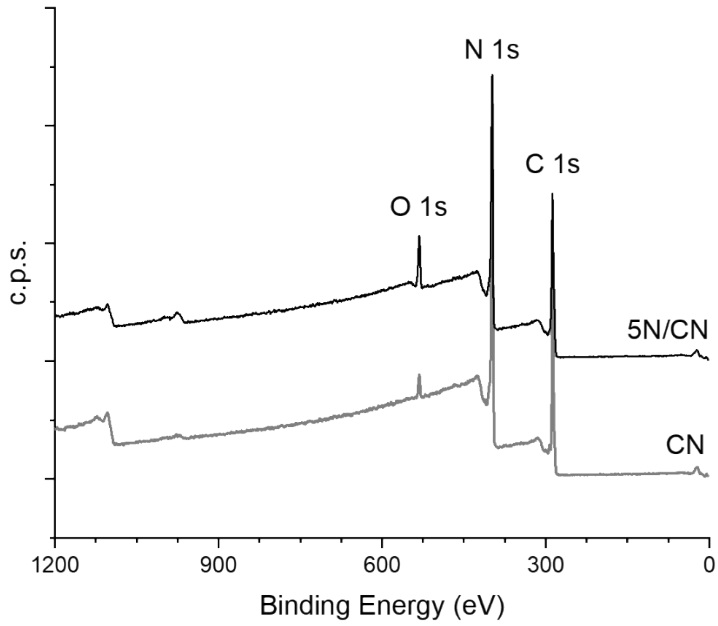

Figure S1: Survey XPS scans of samples of CN and the heterojunction composition 5N/CN.

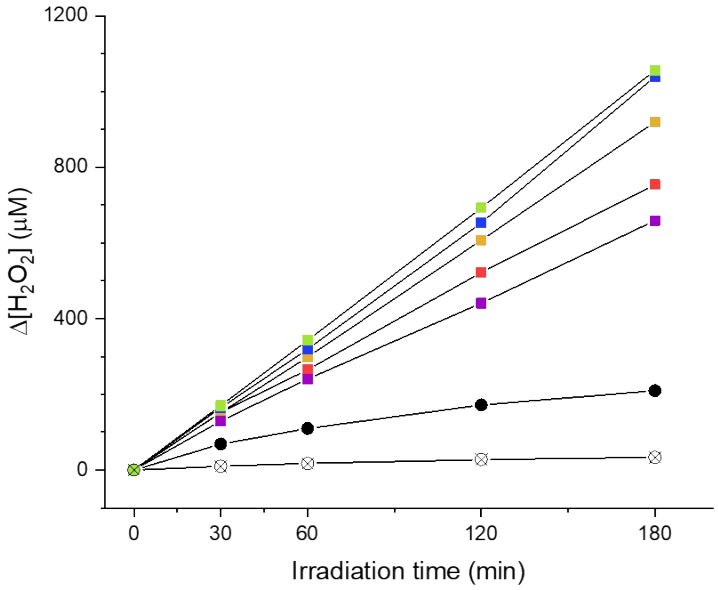

Figure S2: Kinetic traces of photochemical production of H_2O_2 by different NTCDA/CN heterojunction compositions. The tested catalyst compositions contain 0 mg (black), 1 mg (purple), 2.5 mg (blue), 5 mg (green), 7.5 mg (yellow) and 10 mg (red) NTCDA. A control trial of pure NTCDA (no CN) is represented with cross-hatched circles.

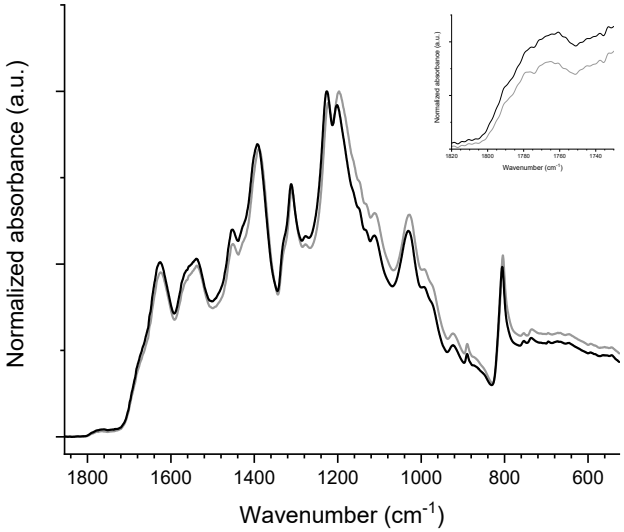

Figure S3: Comparison of FT-IR spectra obtained for samples of 5N/CN heterojunctions that were subjected to visible radiation (black trace) or stirred in the dark (grey trace). The inset image details the NTCDA $\nu_{C=O}$ vibration for both samples.

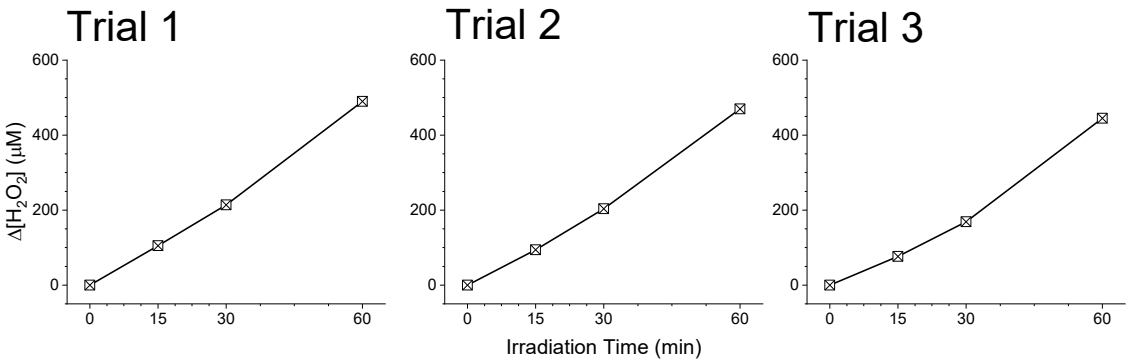

Figure S4: Observed ability of NTCDA/CN heterojunctions to repeatedly generate H_2O_2 under visible radiation without a significant loss of activity. Experimental conditions: 0.83 g catalyst/L, 10% aqueous glycerol, 270 W irradiation ($\lambda \geq 400$ nm). The catalyst sample was recovered by centrifugation (5 min, 7500 rpm) prior to recycling for subsequent trials.

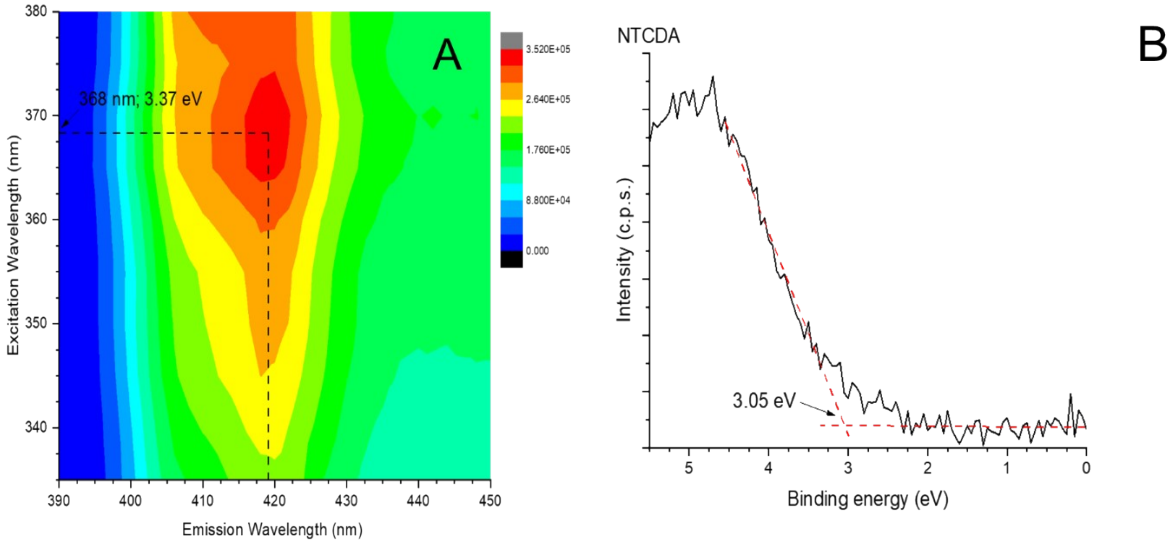

Figure S5: (A) Excitation analysis of NTCDA to identify the HOMO-LUMO transition energy. The wavelength λ = 368 nm corresponds to a transition energy of 3.37 eV. (B) Valence band XPS spectra for samples of pure NTCDA.

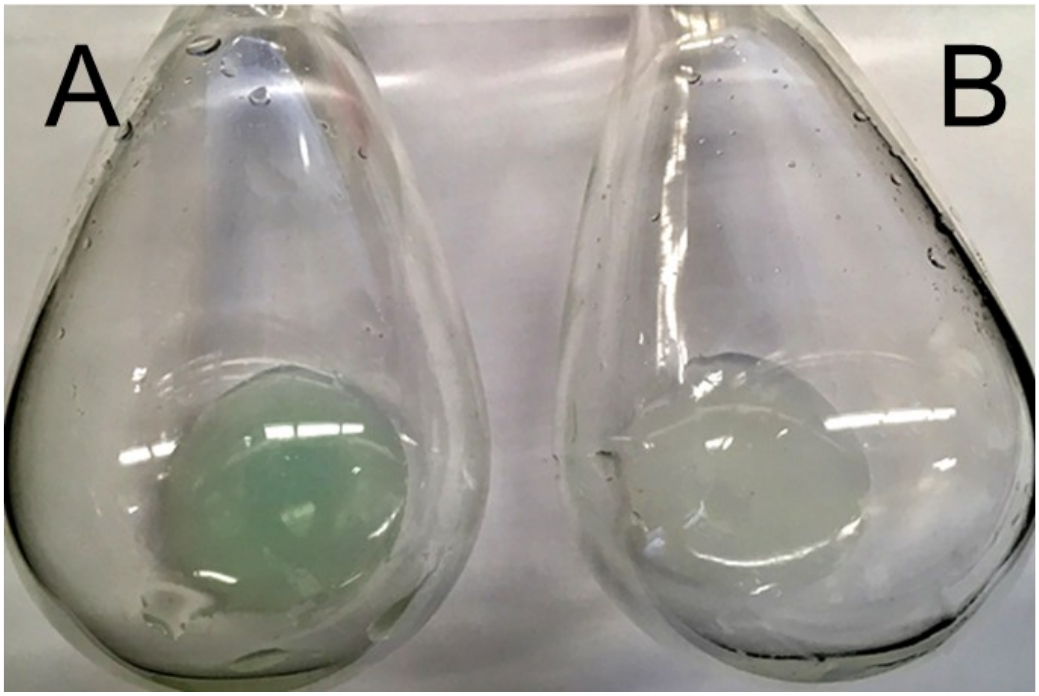

Fig S6: Enhanced visible radiation-induced electron accumulation by composite NTCDA/CN heterojunctions. The presented samples are (A) 5N/CN and (B) pure CN. Experimental conditions: 1g catalyst/L, degassed 10% aqueous glycerol, 270 W irradiation ($\lambda \geq 400$ nm), N_2 atmosphere, 0.5 hour total irradiation period.