Supporting Information

High Efficiency Treatment of Antibiotic Wastewater by Self-Assembled Coated Double Heterojunction TiO_2/g-C_3N_4/BN Photocatalyst

Tiantian Yang [a&], Tong Gao [a&], Jiangtao Fan[b*], Linnan Zhang [a*]

[a] School of Environmental and Chemical Engineering, Shenyang University of Technology, Shenyang, 110870, China.

[b] College of Material Sciene and Engineering, Hefei University of Technology, Hefei, 230009, China

Figure S1

Table S1

Formula S1.1~1.3

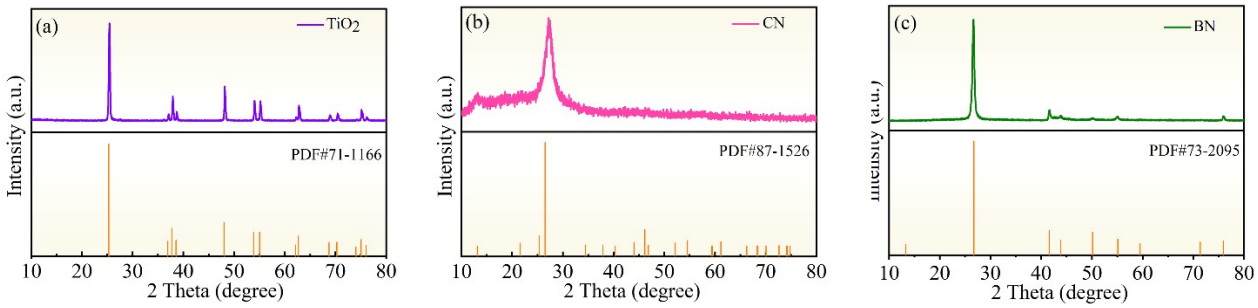

Figure S1. XRD diffraction patterns of (a)TiO_2, (b)CN, (c)BN

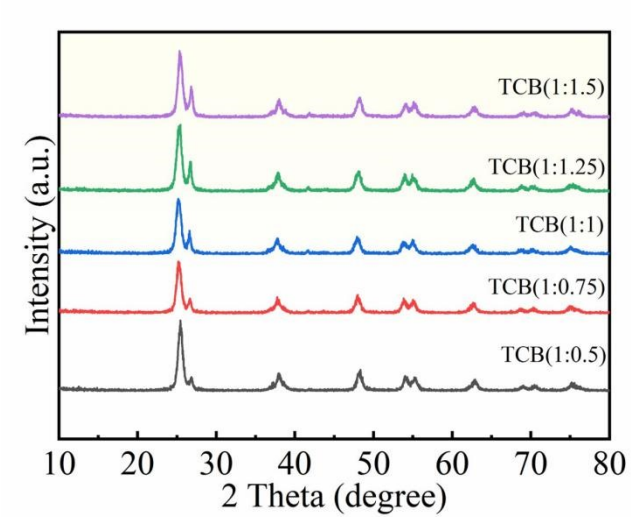

Figure S2. XRD patterns of TCB materials with different proportions of Ti and BN

Table S1 Parameters obtained from N_2 desorption isotherm measurements

Samples	BET surface area ($m^2 \cdot g^{-1}$)	Pore size (nm)	Pore volume ($cm^3 \cdot g^{-1}$)
TiO_2	56.8661	21.8688	0.221878
TCN	64.0113	9.9728	0.167000
TCB	63.8087	14.1684	0.181266

Kubelka-Munk Formula:

$$(ahv)^{1/n}=A(hv-Eg) \quad \text{S1.1}$$

Where a is the absorption coefficient, h is the Planck constant, v is the optical frequency, Eg is the bandgap energy, n is determined by the type of semiconductor

material, when the semiconductor is a direct bandgap, n=1/2; When the semiconductor has an indirect band gap, n=2.

The EVB-XPS values of TiO_2, CN and BN can be obtained according to the results of XPS valence band spectrum, and the valence band potential (EVB-NHE) corresponding to the standard hydrogen electrode potential can be calculated by Formula S1.2.

$$E_{VB\text{-}NHE} = \varphi + E_{VB\text{-}XPS} - 4.44 \quad \text{S1.2}$$

Where EVB-NHE is the valence band potential corresponding to the standard hydrogen electrode potential, and EVB-XPS is the valence band value φ obtained in the XPS valence band spectrum and the work function of the test instrument (φ=4.2). Given the valence band value (EVB) of the material, the conduction band potential (ECB) of the material is calculated according to the Formula S1.3.

$$E_{CB}=E_g-E_{VB} \quad \text{S1.3}$$

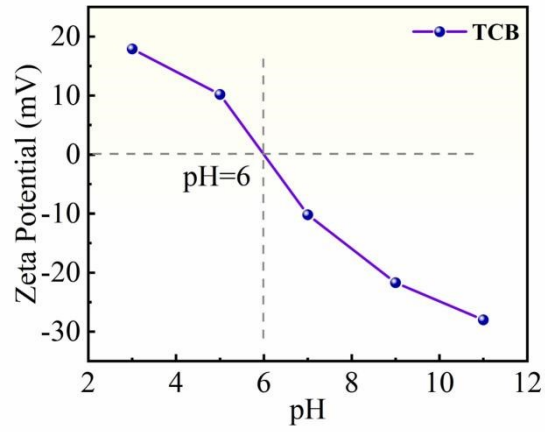

Figure S3. The Zeta potential of TCB at different pH

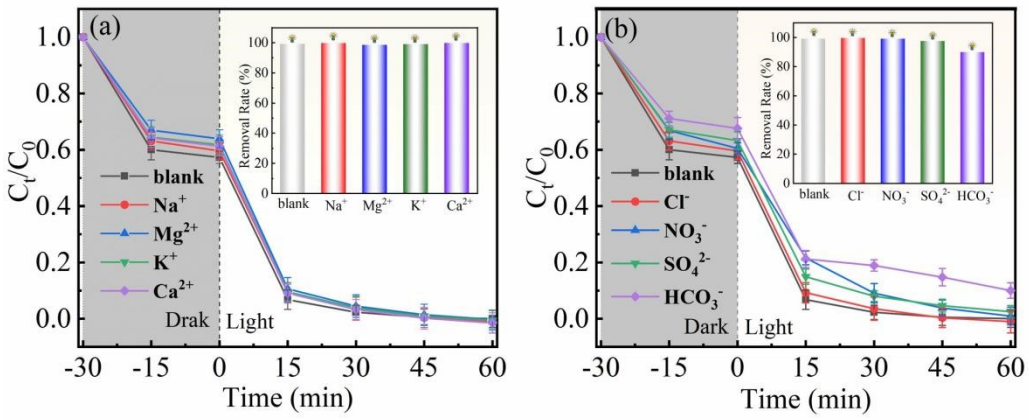

Figure S4. (a) The effects of cations on TCH degradation, (b) The effects of anions on TCH degradation

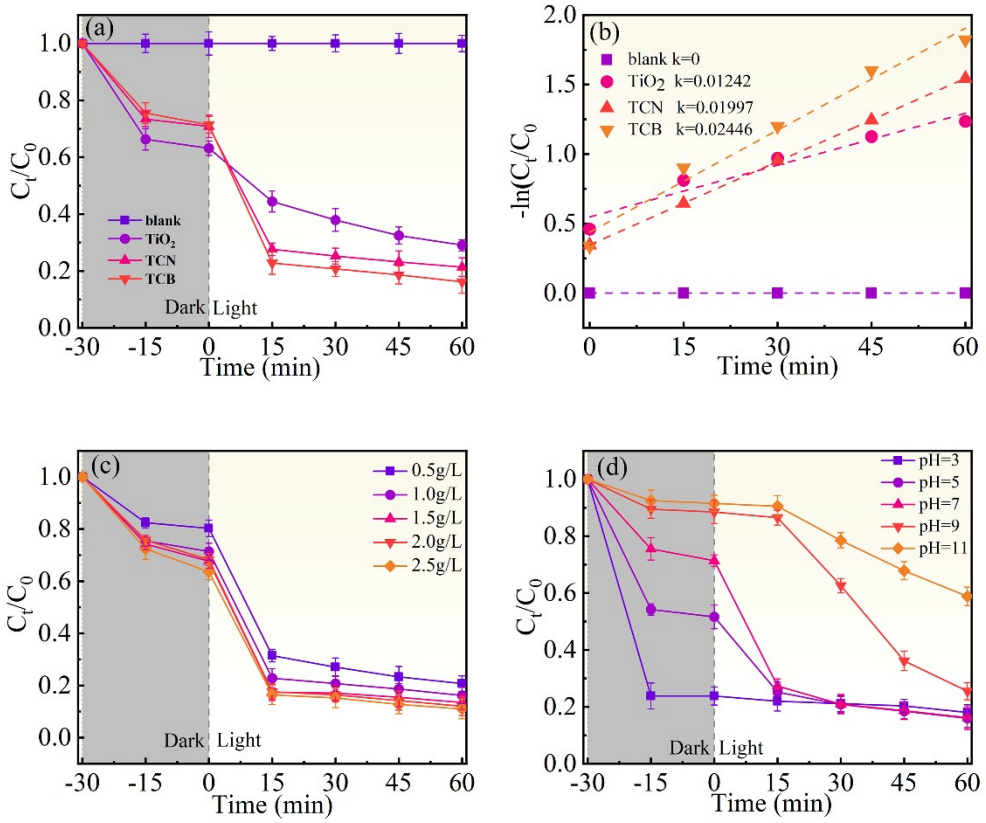

Figure S5 (a) Comparison of photocatalytic activity of several different photocatalysts, (b) Quasi-first-order kinetics curve fitting of several different photocatalysts, (c) Effect of content of TCB on degradation of CTRX, (d) Effect of initial pH value on photocatalytic performance