

Supporting Information

Electron induced effect and coordinated pi-delocalization synergistically promote charge transfer in benzenesulfonic acid modified g-C₃N₄ with efficient photocatalytic performance

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1. Chemical reagents

Urea (CH₄N₂O, 99%) and triethanolamine (TEOA, 78%) are purchased from Sinopharm Chemical Reagent Co., Ltd. Sulfanilic acid (C₆H₇NO₃S 99.5%), p-Benzoquinone (C₆H₄O₂, 99%) and Chloroplatinic acid (H₂PtCl₆·6H₂O, 37.5%) are purchased from Shanghai Aladdin Biochemical Technology Co., Ltd. Tertiary butanol (C₄H₁₀O, AR) is purchased from Tianjin Comio Chemical Reagent Co., Ltd, Methanol (CH₃OH, 99.9%) are purchased from Tianjin Fuchen Chemical Reagent Factory.

Reactive red 2 (99%) is purchased from Shanghai Maclean Biochemical Technology Co., Ltd. Polyvinylidene fluoride (PVDF) and N-methylpyrrolidone (NMP) are purchased from Guangdong Candlelight New Energy Technology Co., Ltd. All the chemical reagents in this study are used without any purification.

2. Characterization

X-ray diffraction (XRD) of the photocatalyst was carried out on a Dmax Rapid II diffractometer. Fourier transform infrared spectroscopy (FT-IR) was performed on a Spotlight 400 spectrometer. X-ray photoelectron spectroscopy (XPS) was performed using a Thermo Scientific K-Alpha XPS instrument with a standard monochromatic light source. Scanning electron microscopy (SEM) and energy-dispersive X-ray (EDX) elemental mapping were performed using an FEI Quanta 450 FEG microscope. Transmission electron microscopy (TEM) images and selected area electron diffraction (SAED) images were acquired using a JEM-2100F microscope. N₂ adsorption-desorption tests were obtained from a Micromeritics ASAP 2020 plus analyzer at 77.4 K. Solid-state ¹³C magnetic resonance (NMR) spectroscopy was recorded using Bruker AVANCE III HD 400 MHz. Electrochemical impedance spectroscopy (EIS), Mott-Schottky analysis, and linear sweep voltammetry (LSV) were conducted using a standard three electrode cell with a 0.1 M KCl solution containing 0.001 M K₃Fe (CN)₆ and 0.001 M K₄Fe (CN)₆ as the electrolyte (pH = 6.43), platinum as the counter electrode, saturated calomel electrode as the reference electrode, and the sample deposited onto ITO glass as the working electrode. Photoluminescence (PL) spectra were obtained using an FLSP920 Edinburgh fluorescence spectrometer. UV-vis diffuse

reflectance spectra (UV-vis DRS) were recorded on a Cary 500 spectrometer.

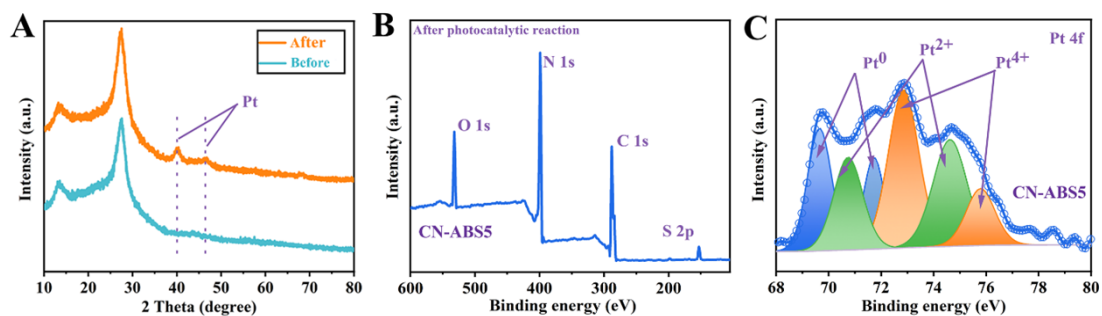


Figure S1. (A) XRD spectra, (B) XPS survey spectra and (C) the corresponding high-resolution XPS pattern of CN-ABS5 sample after photocatalytic reaction.

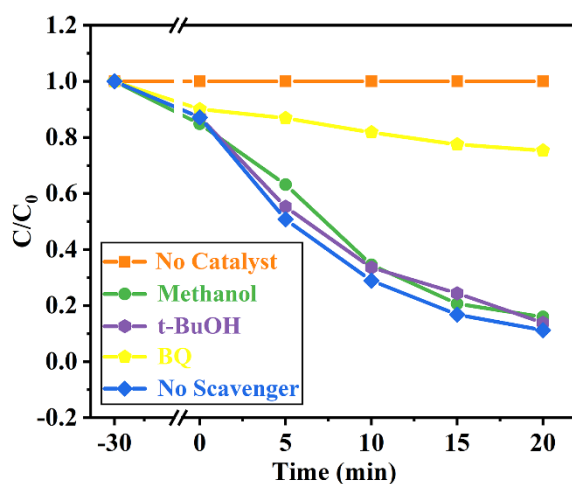


Figure S2. The trapping experiment of Reactive red 2 by using CN-ABS5 photocatalyst.

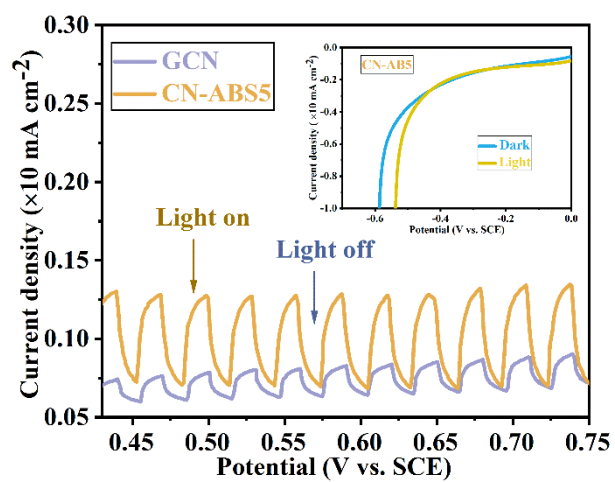


Figure S3. Current-potential curves of the electrodes in the dark and under illumination with a scan rate of 2 mV s^{-1} .