Supporting Information

A unique Z-scheme 2D/2D nanosheet heterojunction design to harness charge transfer for photocatalysis

Huijie Cheng,[a] Jungang Hou,[ab*] Osamu Takeda,[b] Xing-Min Guo,[a] Hongmin Zhu[ab]

[a]School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing, Beijing 100083, China

[b]Tohoku University, 6-6-02 Aramaki-Aza-Aoba, Aoba-ku, Sendai, 980-8579 Japan

Corresponding author: jhou@ustb.edu.cn

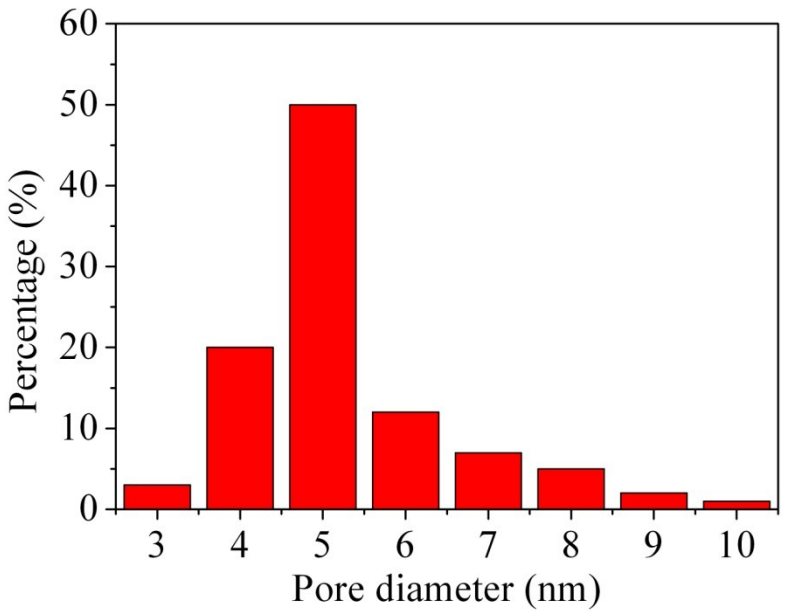

Figure S1. The pore size distribution of mesoporous structure of hybrids.

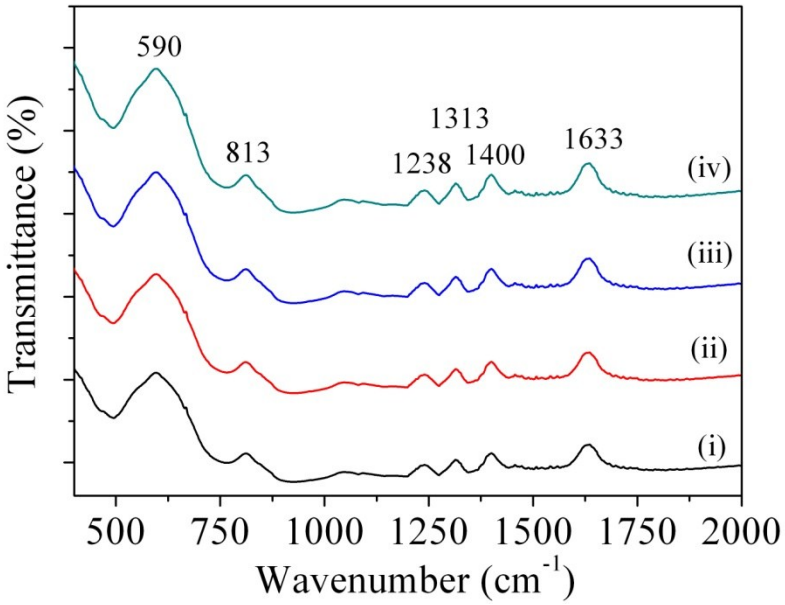

Figure S2. FT-IR spectra of as-prepared (i) 5wt%CN/BTO, (ii) 10wt%CN/BTO, (iii) 15wt%CN/BTO, (iv) 20wt%CN/BTO nanosheet heterojunctions.

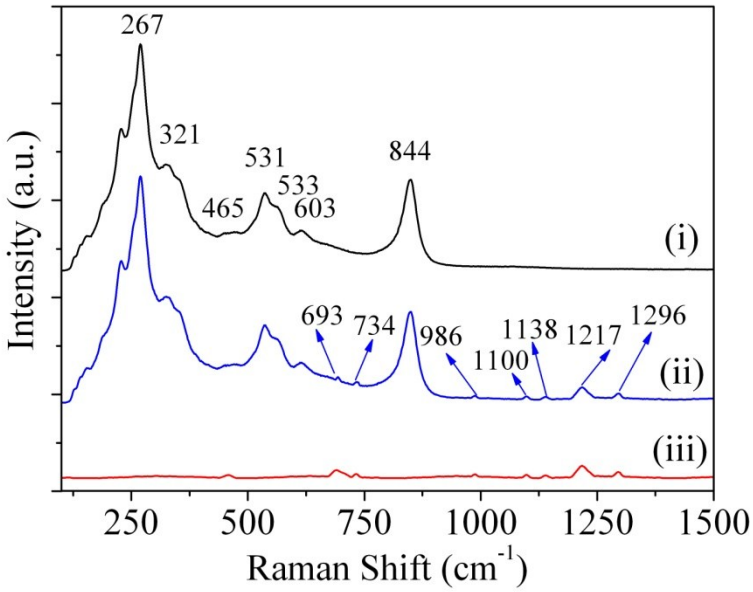

Figure S3. Raman spectra of different samples. (i) Bismuth titanate, (ii) 15wt% carbon nitride/bismuth titanate and (iii) carbon nitride.

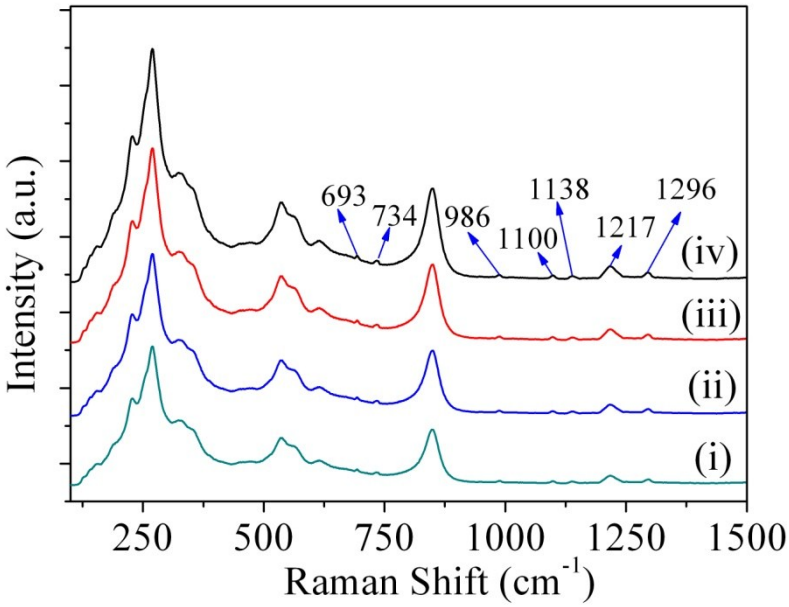

Figure S4. Raman spectra of as-prepared (i) 5wt%CN/BTO, (ii) 10wt%CN/BTO, (iii) 15wt%CN/BTO, (iv) 20wt%CN/BTO nanosheet heterojunctions.

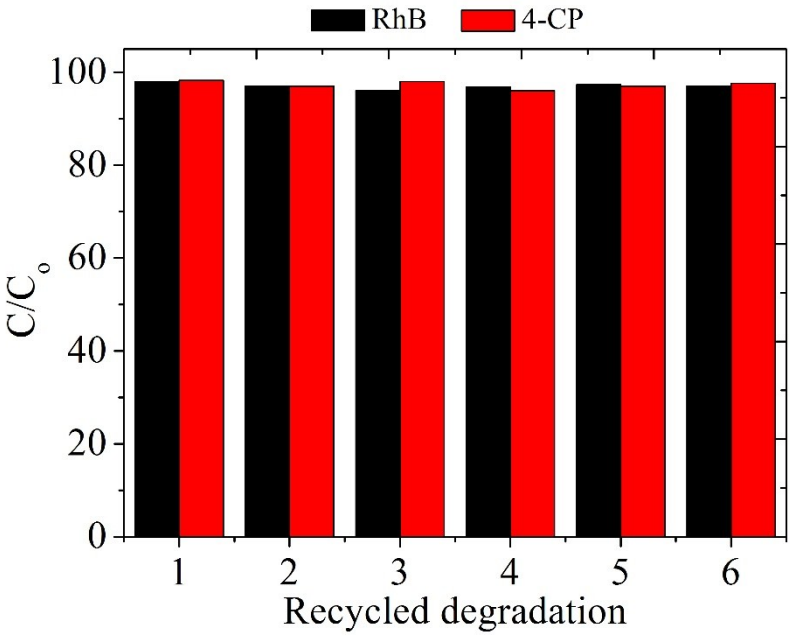

Figure S5. Recycled photodegradation performance of RhB and 4-CP solutions for as-prepared 15wt%CN/BTO heterojunctions.

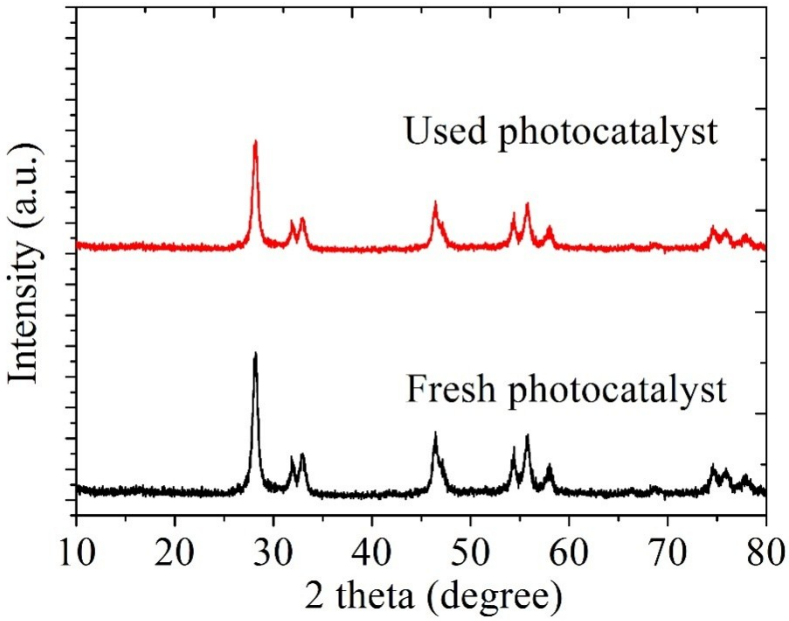

Figure S6. XRD patterns of the 15wt%CN/BTO heterojunctions before and after the photocatalysis.

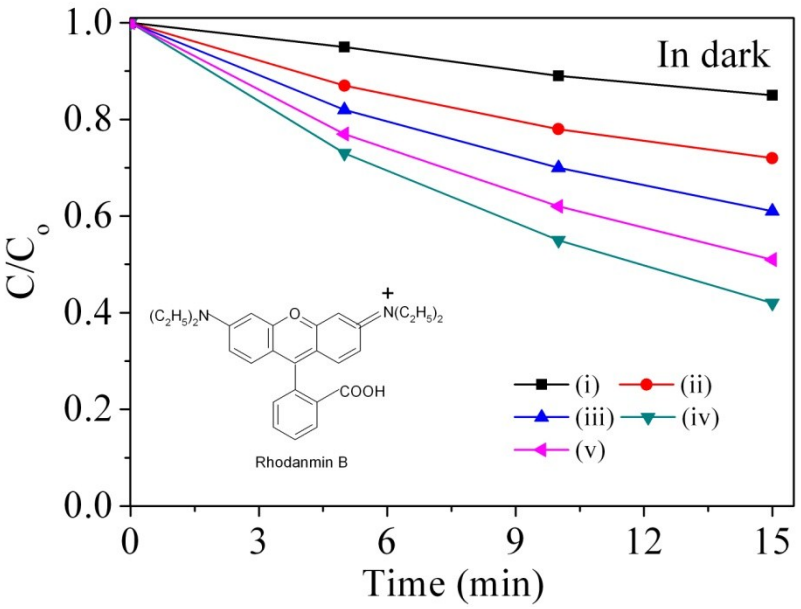

Figure S7. Absorption activities of RhB solution for as-prepared various hybrids. (i) BTO; (ii) 5wt%CN/BTO; (iii) 10wt%CN/BTO; (iv) 15wt%CN/BTO; and (v) 20wt%CN/BTO heterojunctions in dark.

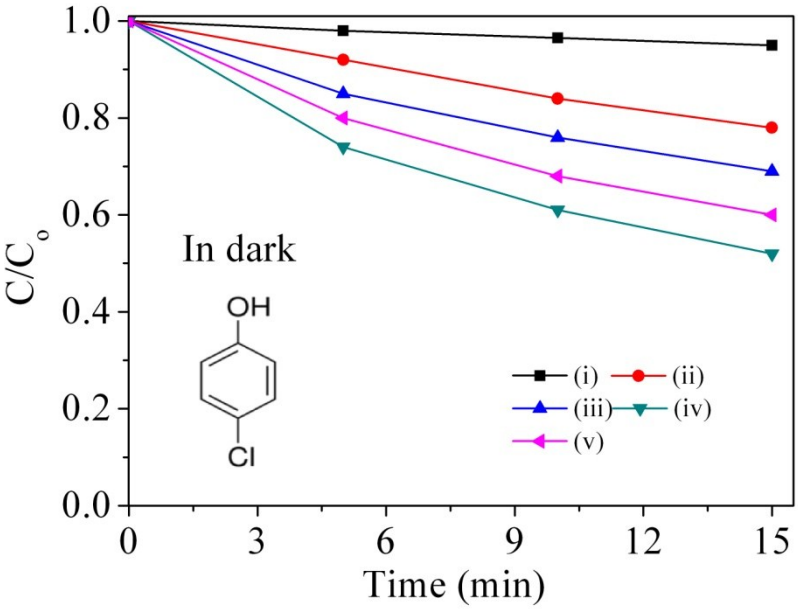

Figure S8. Absorption activities of 4-CP solution for as-prepared various hybrids. (i) BTO; (ii) 5wt%CN/BTO; (iii) 10wt%CN/BTO; (iv) 15wt%CN/BTO; and (v) 20wt%CN/BTO heterojunctions in dark.

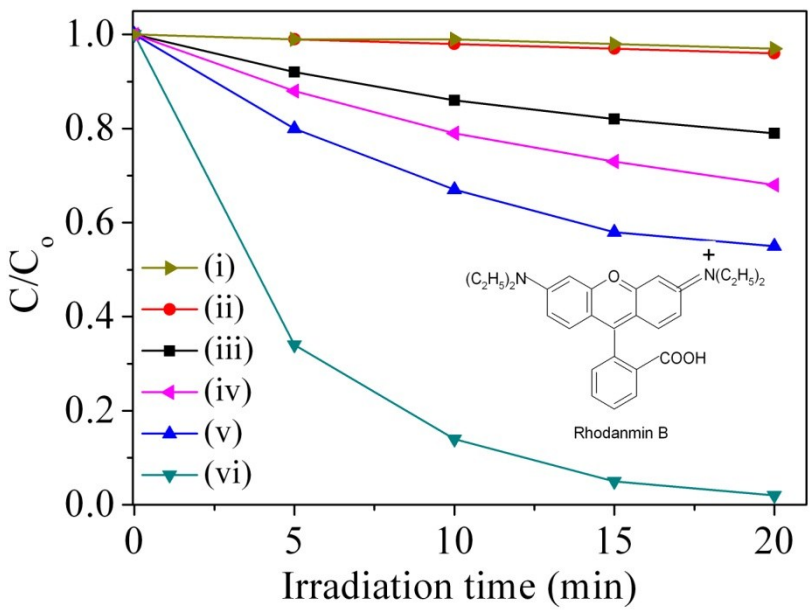

Figure S9. Photocatalytic activities of RhB solution for as-prepared various samples. (i) blank experiment in the absence of catalyst, (ii) bulk BTO; (iii) O-vacancy confined in BTO nanosheets; (iv) C_3N_4 nanosheets; (v) simple mixture of C_3N_4 and O-vacancy confined in BTO nanosheet and (vi) 15wt% CN/O-vacancy confined in BTO nanosheet heterojunctions.

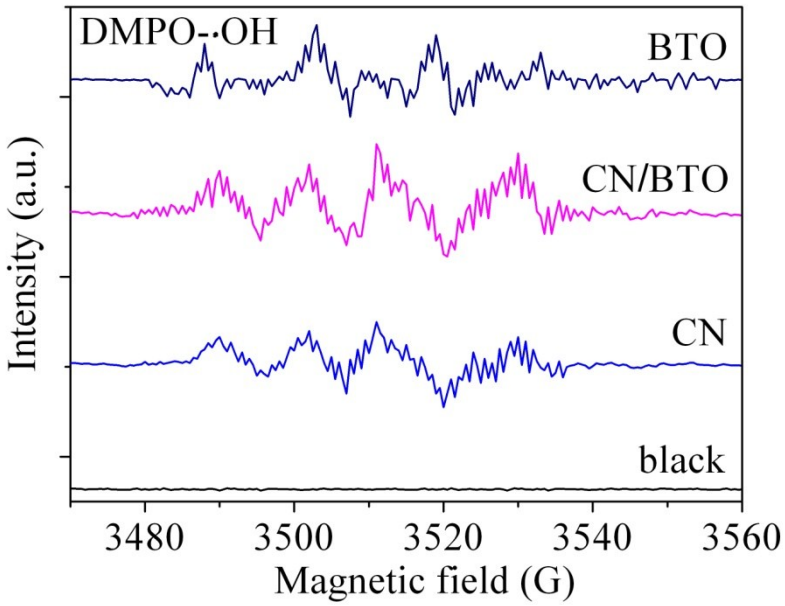

Figure S10. Electron spin resonance (ESR) signals of the DMPO-•OH with irradiation for 20 s in methoal dispersion.