Electronic Supplementary Information for

Direct Functionalization of Cellulose Nanocrystals with Polymer Brushes via UV-induced Polymerization: Access to Novel Heterogeneous Visible-light Photocatalysts

Liman Hou,[a,c] Hang Bian,[a,b] Qiliao Wang,[a,c] Ning Zhang,[a,c,*] Yongjiu Liang[a] and Dewen Dong[a,c,*]

[a]*Key Laboratory of Synthetic Rubber, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, P. R. China*

[b] *University of the Chinese Academy of Sciences, Beijing 100864, People's Republic of China.*

[c]*Changzhou Institute of Energy Storage Materials & Devices, Changzhou, 213000, P. R. China*

Correspondence to: N. Zhang (E-mail: ning.zhang@ciac.ac.cn) or D. Dong (E-mail: dwdong@ciac.ac.cn)

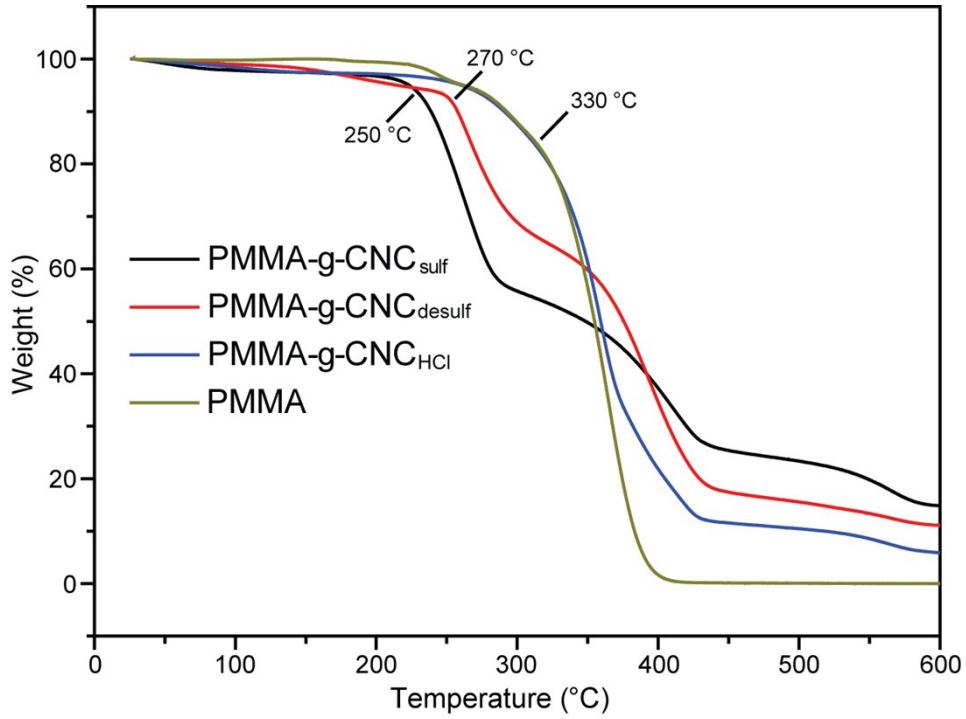

Figure S1. Thermogravimetric analysis curves for PMMA-g-CNC_{sulf}, PMMA -g-CNC_{desulf}, PMMA-g-CNC_{HCl} and PMMA.

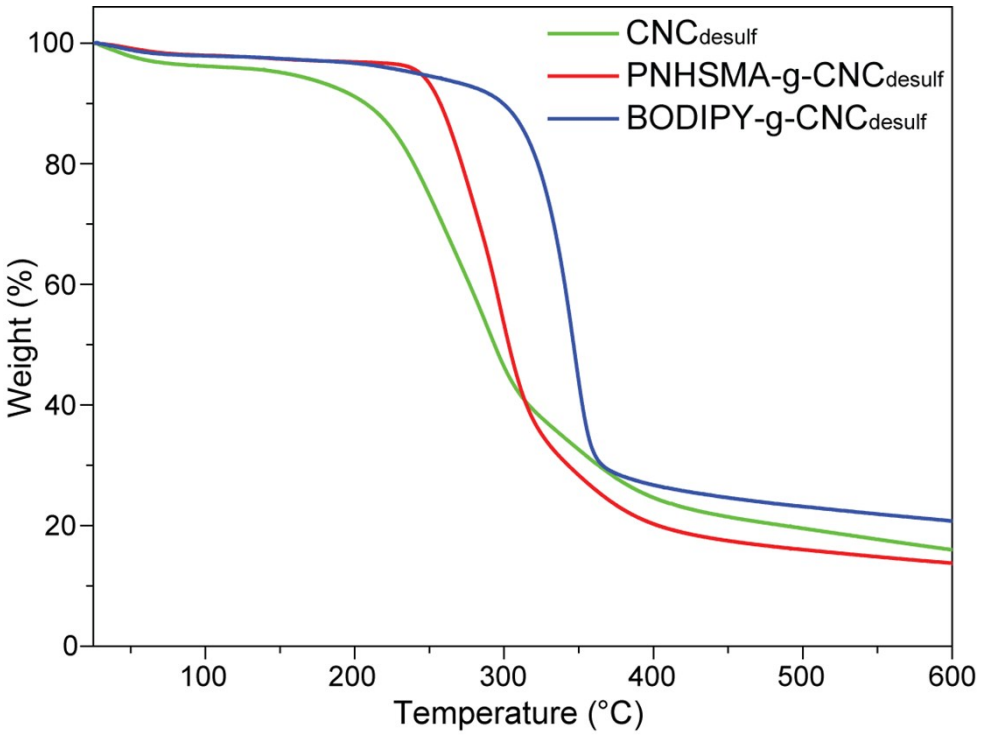

Figure S2. Thermogravimetric analysis curves for PHNSMA-g-CNC_{desulf}, BODIPY -g-CNC_{desulf} and CNC_{desulf}.

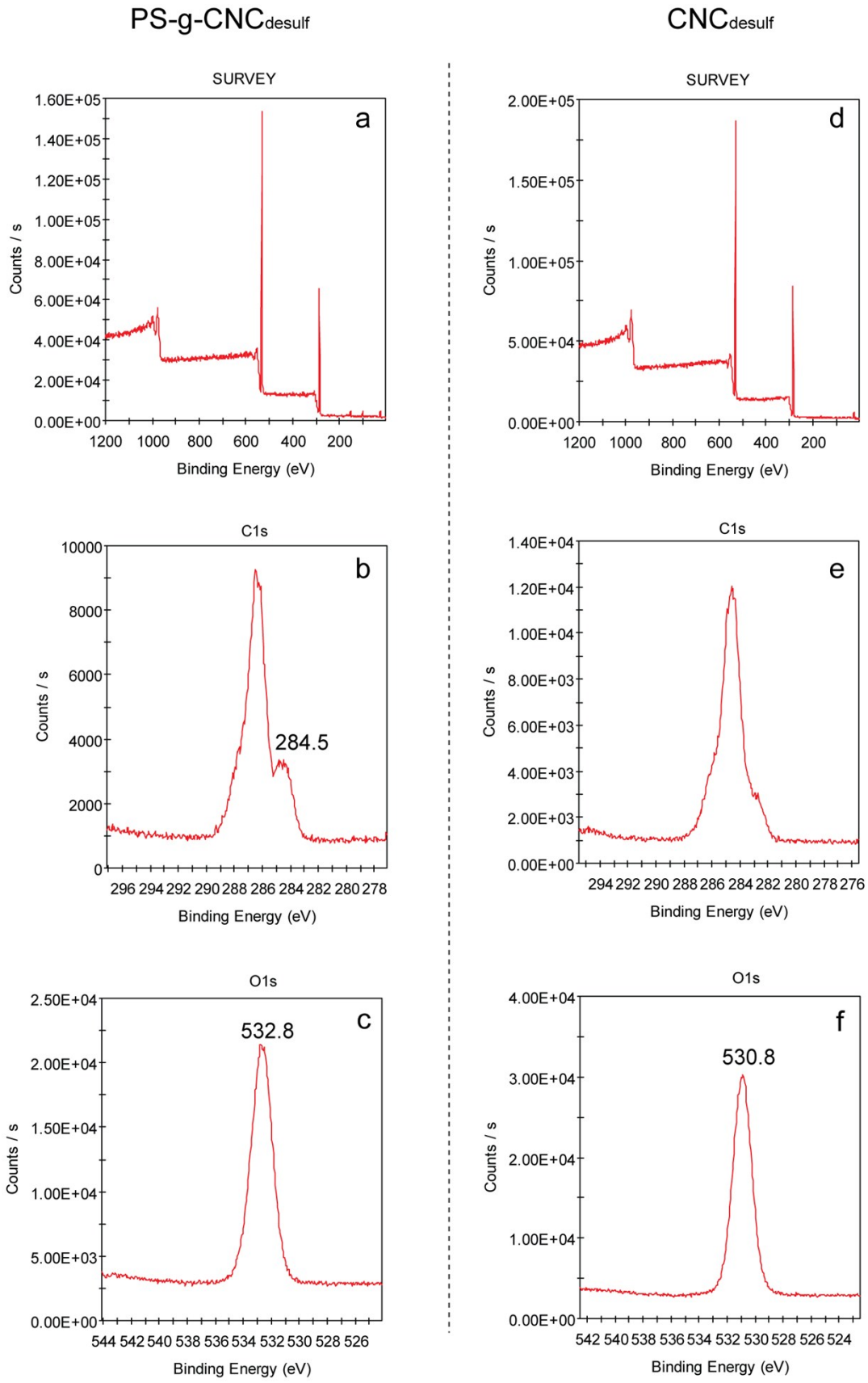

Figure S3. XPS survey scan (a,d), detailed C1s (b,e), and O1s (c,f) spectra of PS-g-CNC_{desulf} and CNC_{desulf}.

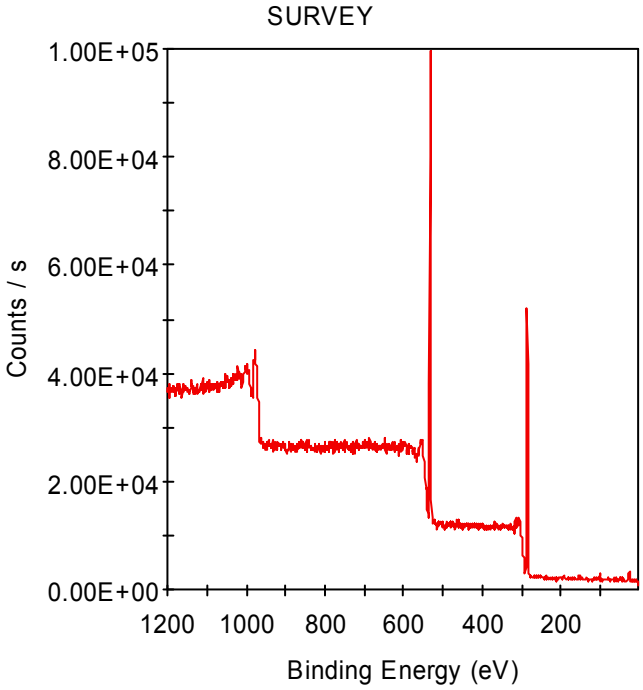

Figure S4. XPS survey scan of PNHSPM-g-CNC$_{desulf}$.

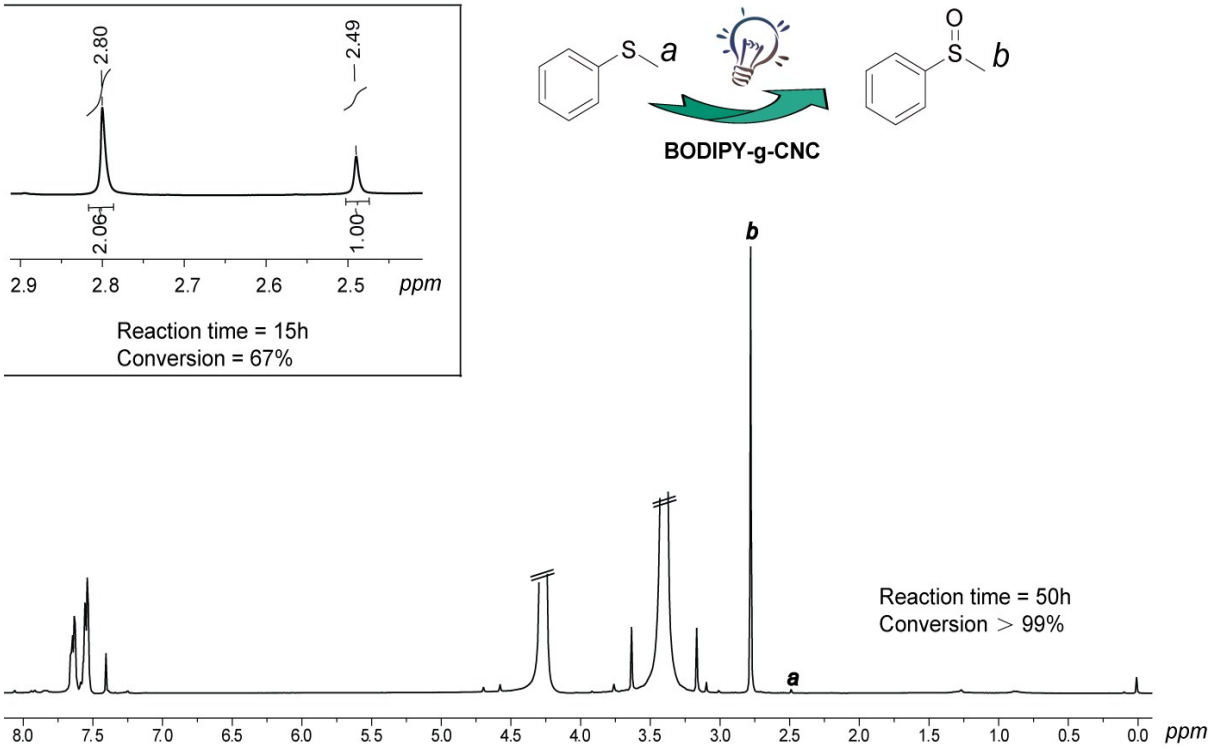

Figure S5. ^{1}H NMR spectrum of oxidation reaction of thioanisole using BODIPY-g-CNC as the catalyst after 50h to yield methyl phenyl sulfoxide, where the peak at 2.78 from the product and the peak at 2.49 from the substrate were used to calculate the conversion. (inlet: ^{1}H NMR spectrum of the oxidation solution after 15 h reaction time).

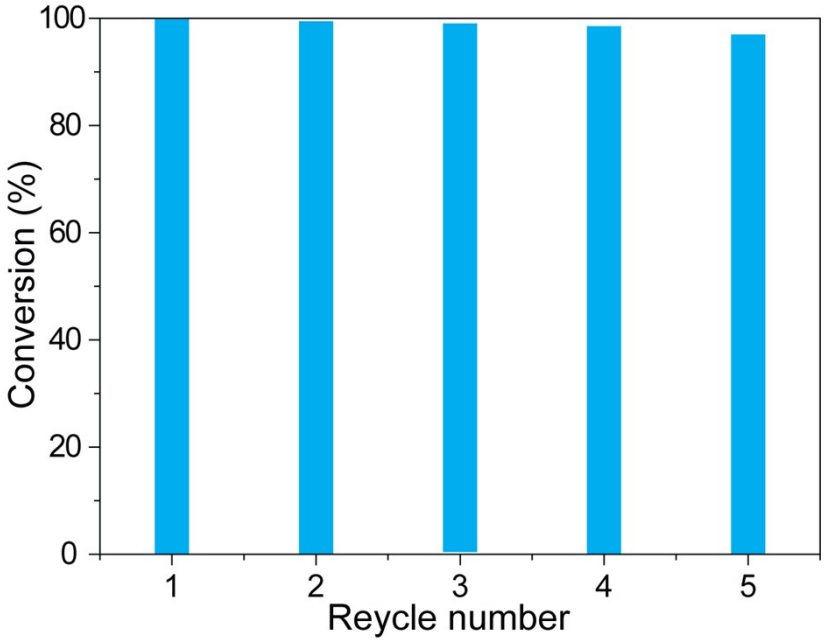

Figure S6. Reusability of the BODIPY-g-CNC as a photocatalyst for the oxidation of thioanisole, repeated cycles with identical batch of the photocatalyst.

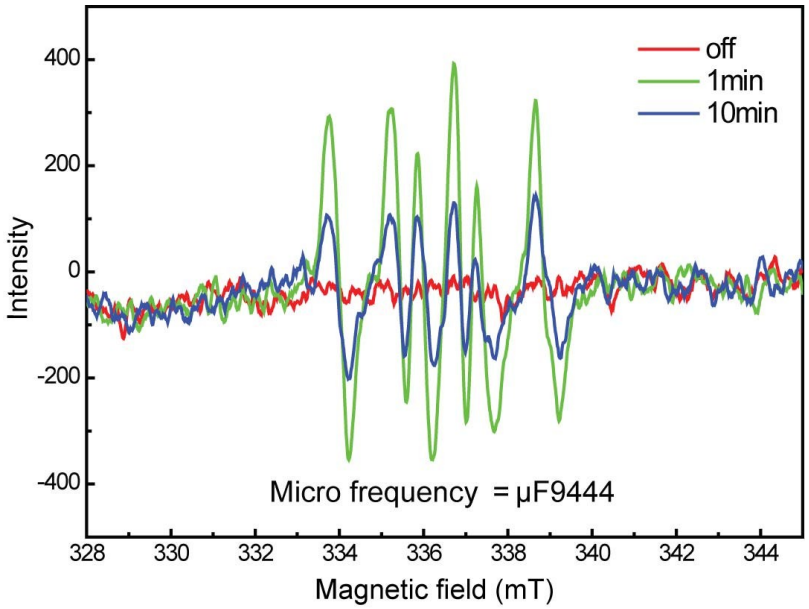

Figure S7. ESR spin trapping experiments during the UV-light irradiation of CNC_{desulf} and MMA in DMF with DMPO as the trapping agent.