Electronic Supplementary Material (ESI) for Catalysis Science & Technology

Supporting Information

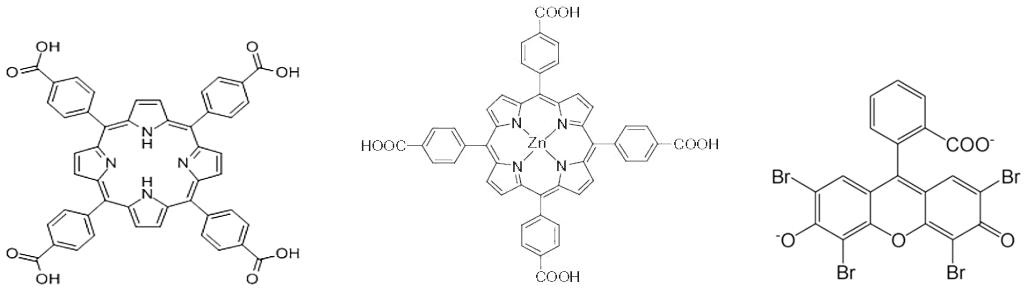
Tetra(4-carboxyphenyl)porphyrin for Efficient Cofactor Regeneration under Visible Light and Its Immobilization

Yanzi Wang, Jing Sun, Haohai Zhang, Zhiping Zhao, Wenfang Liu*

School of Chemistry and Chemical Engineering, Beijing Institute of Technology,

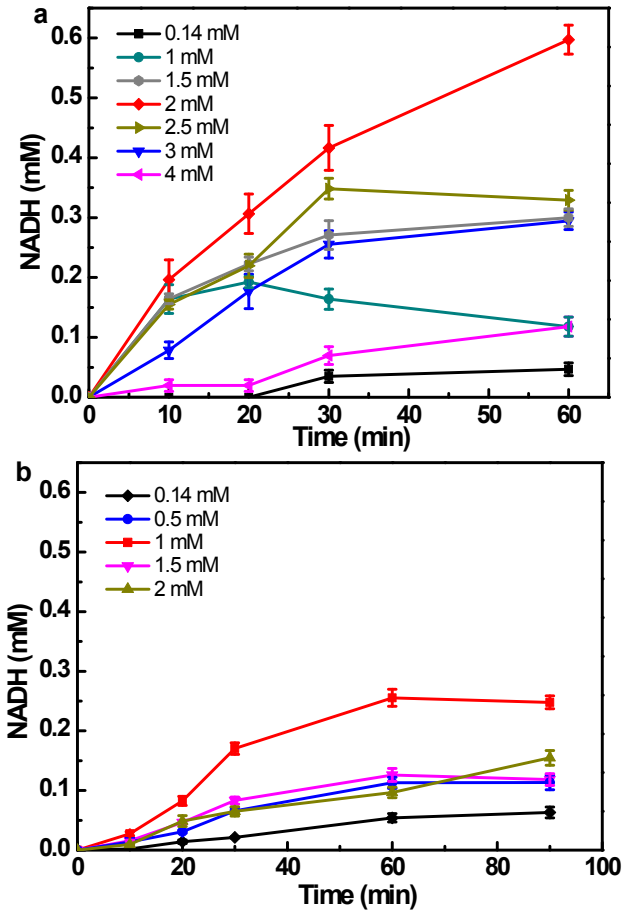
Beijing 102488, China

*Email: liuwenfang@bit.edu.cn



(a) (b) (c)

Scheme S1 Molecular structures of (a) TCPP, (b) ZnTCPP and (c) EY.



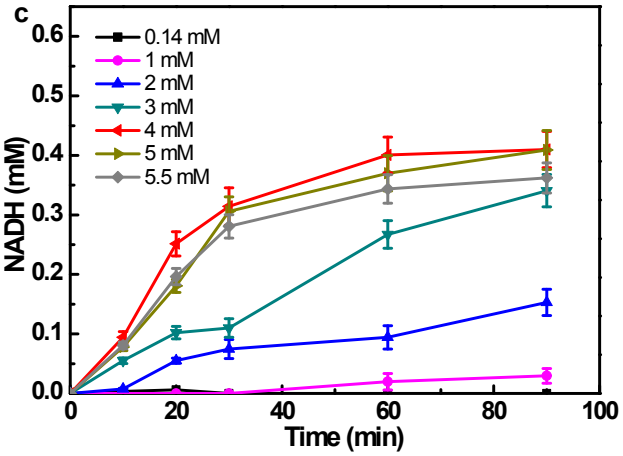


Fig. S1 Reaction kinetic curves of visible light-driven NADH regeneration using (a) TCPP, (b) ZnTCPP or (c) EY as a photosensitizer. TEOA concentration was 1 mM.

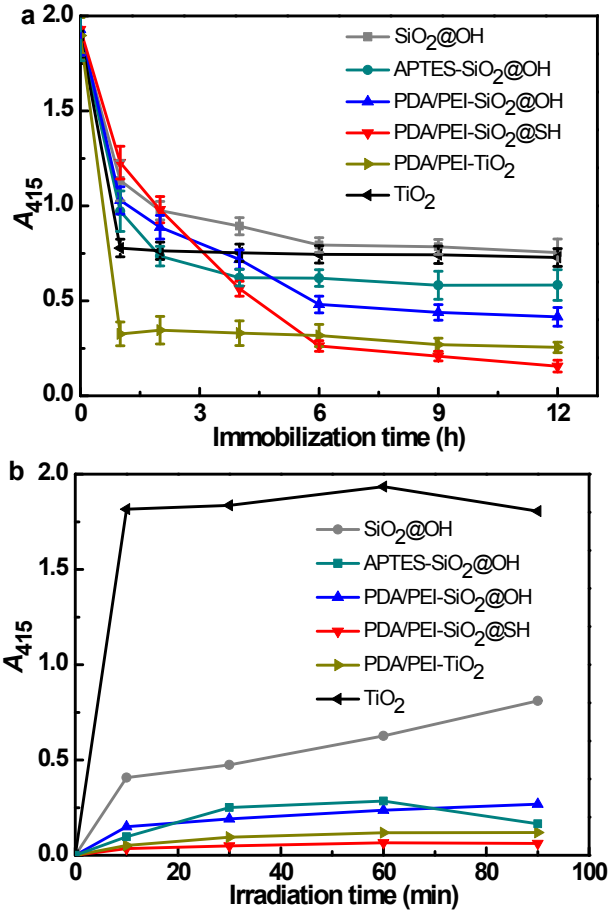


Fig. S2 Change in the value of A_{415} (a) in the process of TCPP adsorption on different supports and (b) for different immobilized TCPP systems with the regeneration reaction proceeded.

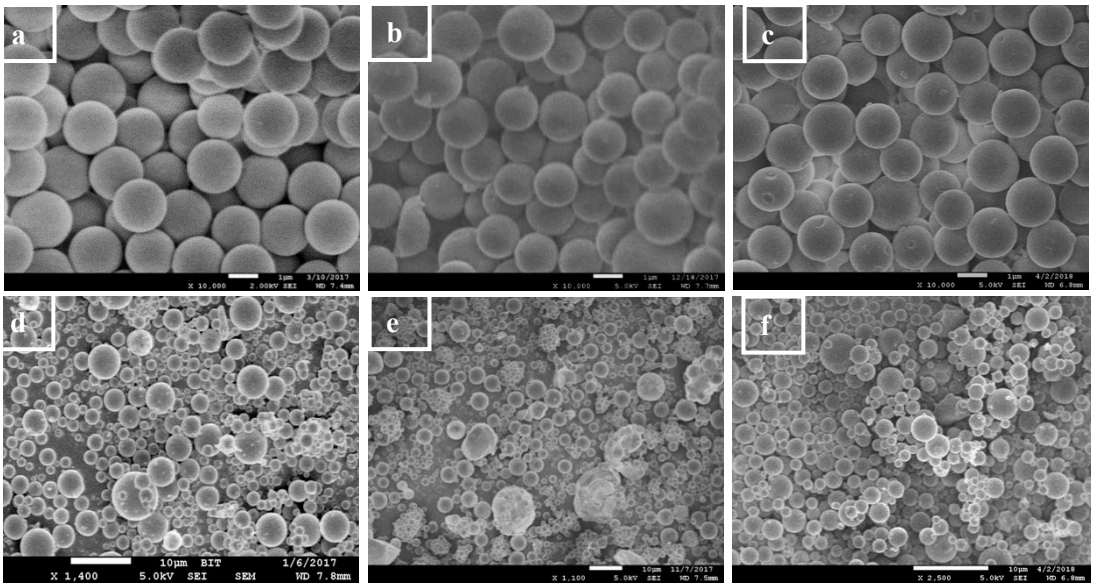


Fig. S3 SEM photos of (a) SiO_2@SH, (b) PDA/PEI-SiO_2@SH, (c) TCPP-PDA/PEI-SiO_2@SH, (d) SiO_2@OH, (e) PDA/PEI-SiO_2@OH and (f) TCPP-PDA/PEI-SiO_2@OH.

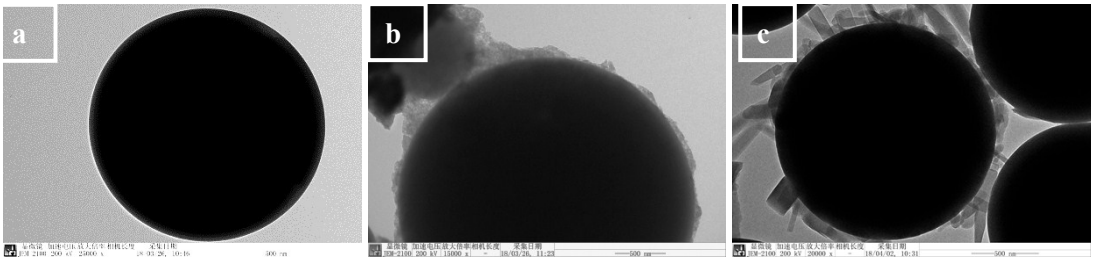
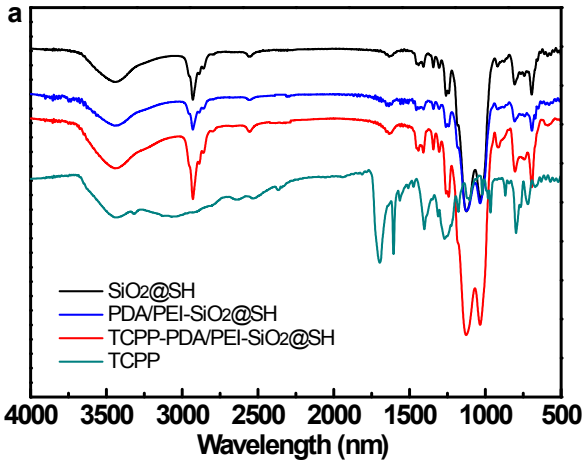


Fig. S4 TEM photos of (a) SiO_2@SH, (b) PDA/PEI-SiO_2@SH and (c) TCPP-PDA/PEI-SiO_2@SH.



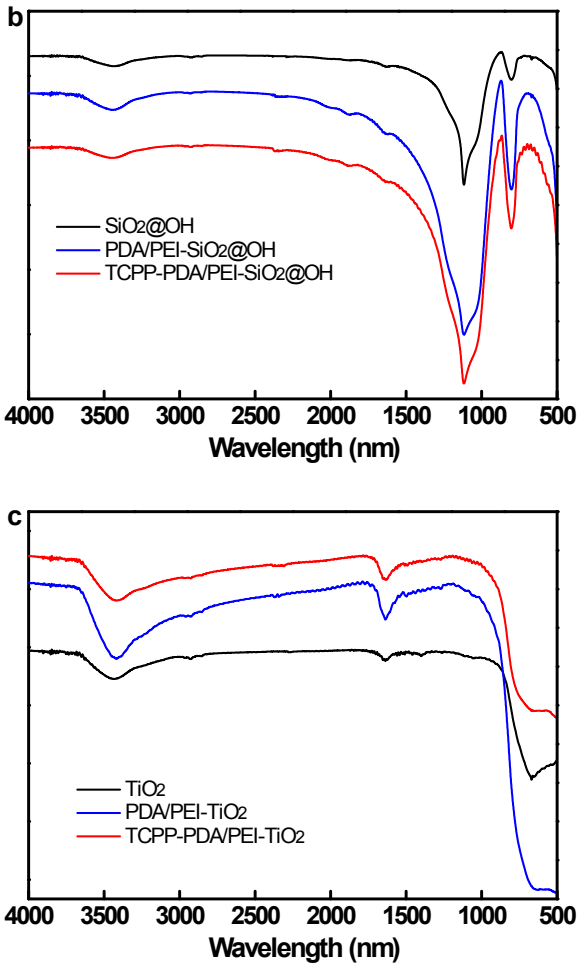


Fig. S5 FTIR spectra of (a) SiO_2@SH, (b) SiO_2@OH and (c) TiO_2 after PDA/PEI modification and TCPP adsorption.

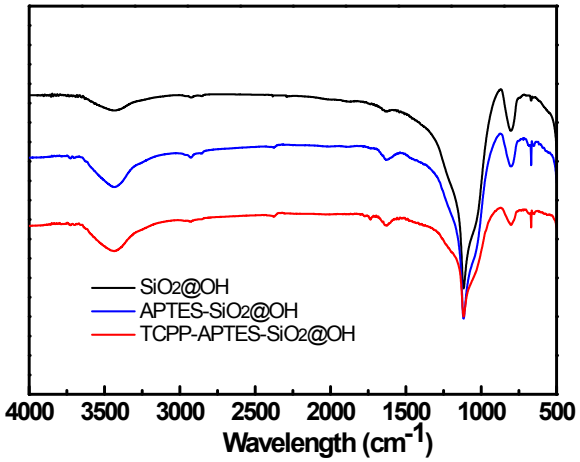
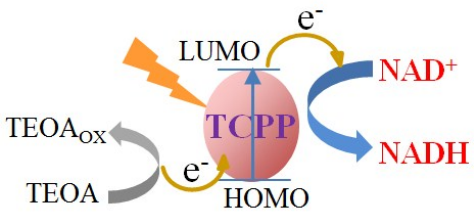


Fig. S6 FTIR spectra of SiO_2@OH microspheres after APTES modification and TCPP adsorption.



Scheme 2 Schematic diagram of a visible light-driven NADH regeneration system in the presence of TCPP with TEOA as an electron donor. HOMO and LUMO are the highest occupied molecular orbital and lowest unoccupied molecular orbital, respectively.