Supporting Information for Hydration of Phenylacetylene on Sulfonated Carbon Materials: Active Site and Intrinsic Catalytic Activity

Pengqiang Yan,^{a, b} Zailai Xie,*^c Siyuan Tian,^a Fan Li,^a Dan Wang,^{a, d} Dang Sheng Su*^a and Wei Qi*^{a, b}

^{a.} Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, 72 Wenhua road, Shenyang, 110016, P. R. China.

Email: wqi@imr.ac.cn, dssu@imr.ac.cn,

^{b.} University of Chinese Academy of Sciences, Beijing, 100049, P. R. China.

^{c.} State Key Laboratory of Photocatalysis on Energy and Environment, College of Chemistry,

Fuzhou University, Fuzhou 350116, P. R. China.

Email: zlxie@fzu.edu.cn

^{d.} School of Sciences, Northeastern University, Shenyang, Liaoning, 110819, China.



Figure S1. XPS profiles for Sglu (black), SCNT (red), SAC (green) and SCMK (blue). S 2p fine XPS spectra (inset) for Sglu (black), SCNT (red), SAC (green) and SCMK (blue).



Figure S2. Raman spectra for (a) Sglu, (b) SCNT, (c) SAC, and (d) SCMK before sulfonation (BS), before reaction (BR) and after reaction (AR). The I_{D1}/I_G values are shown in the figures.



Figure S3. Arrhenius plots for the PA conversion on Sglu (black, square) and SCNT (red, sphere). Reaction conditions: 100 mg catalysts, 1 ml PA and 1.8 ml H_2O , 120 °C.



Figure S4. NH₃, CO₂, H₂O, SO₂ and SO₃ signals during NH₃-TPD for Sglu (a) and SCNT (b).



Figure S5. TEM images of Sglu (a), SCNT (b), SAC (c) and SCMK (d) after reaction, respectively.



Figure S6. The recyclability and reusability of Sglu and SCNT.

XPS (at. %)	Sglu	SCNT	SAC	SCMK
С	82.7	95.3	88.4	92.5
Ο	15.5	4.7	9.88	6.35
S	0.90	0	0.35	0.45

 Table S1. XPS results of the sulfonated carbon catalysts after reaction.