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

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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_D/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 H₂O, 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.
**Table S1.** XPS results of the sulfonated carbon catalysts after reaction.

| XPS (at. %) | Sglu | SCNT | SAC  | SCMK |
|------------|------|------|------|------|
| C          | 82.7 | 95.3 | 88.4 | 92.5 |
| O          | 15.5 | 4.7  | 9.88 | 6.35 |
| S          | 0.90 | 0    | 0.35 | 0.45 |