

## Supporting Information

### Palladium-functionalized polysiloxane drop-casted on carbon paper as a heterogeneous catalyst for Suzuki–Miyaura reaction

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## S1. Characterization of CMP

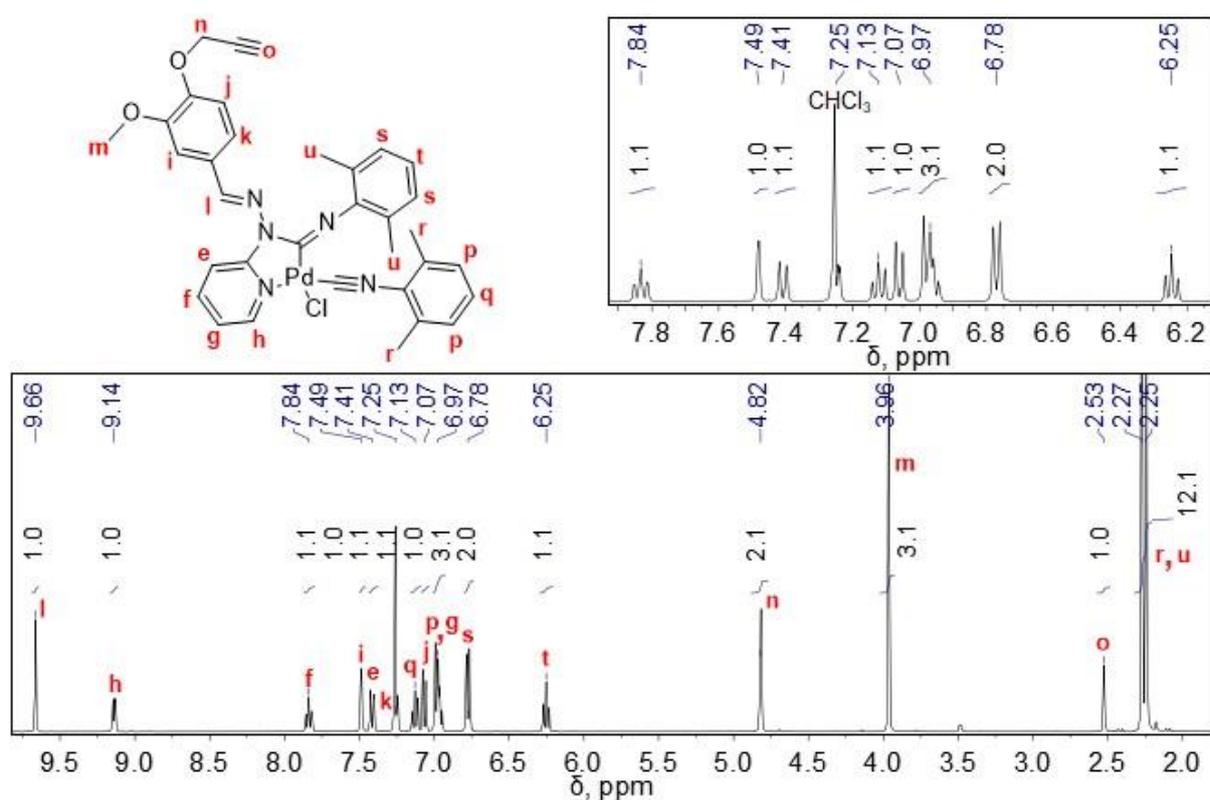


Figure S1.  $^1\text{H}$  NMR of CMP registered in  $\text{CDCl}_3$ .

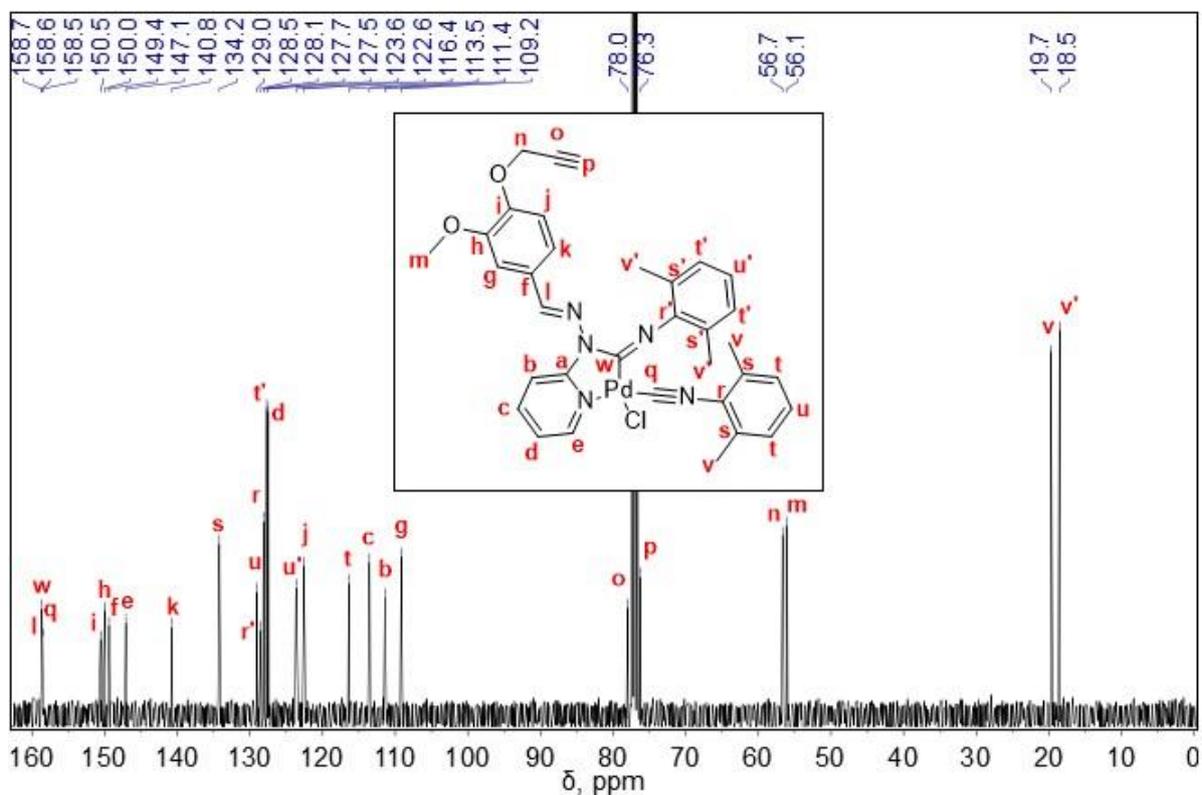
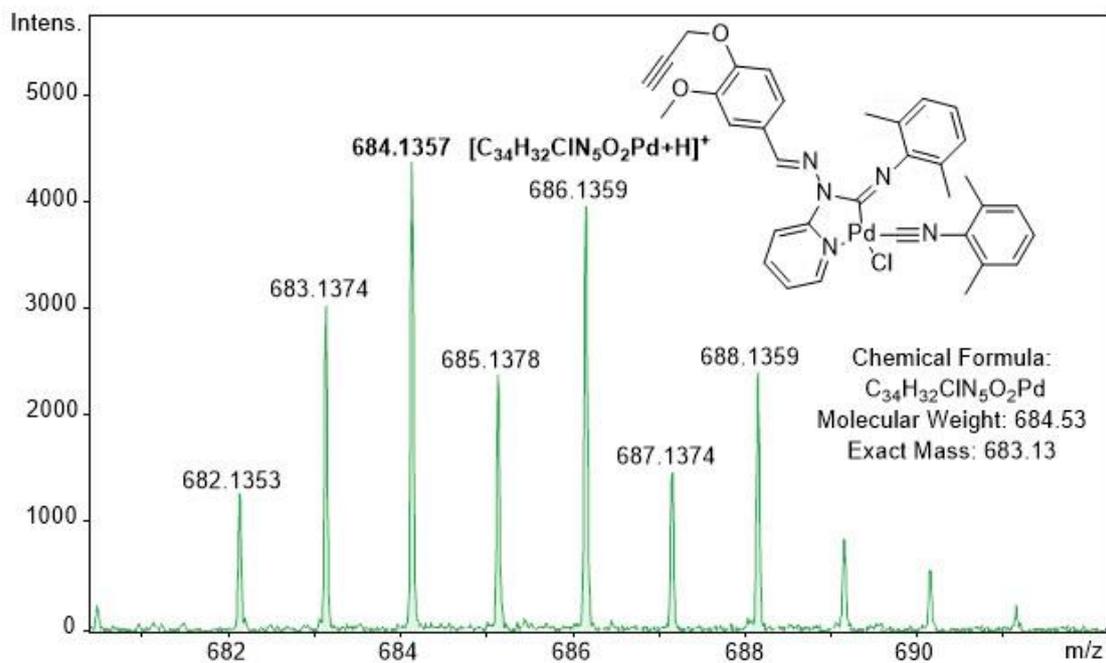
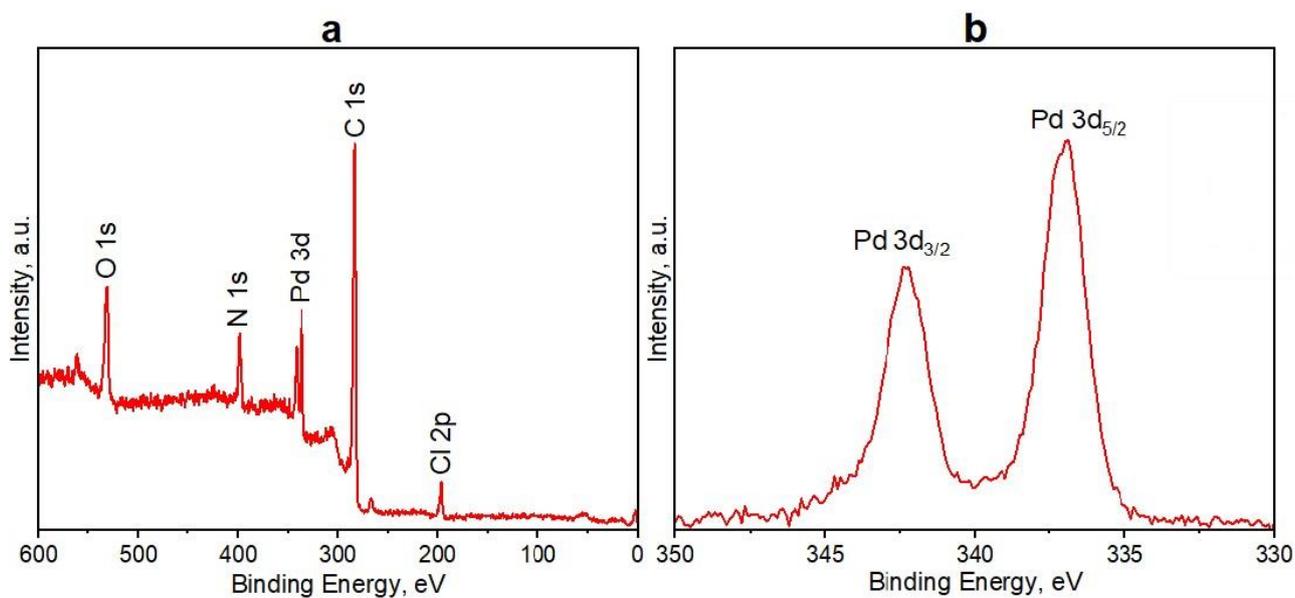


Figure S2.  $^{13}\text{C}\{^1\text{H}\}$  NMR of CMP registered in  $\text{CDCl}_3$ .



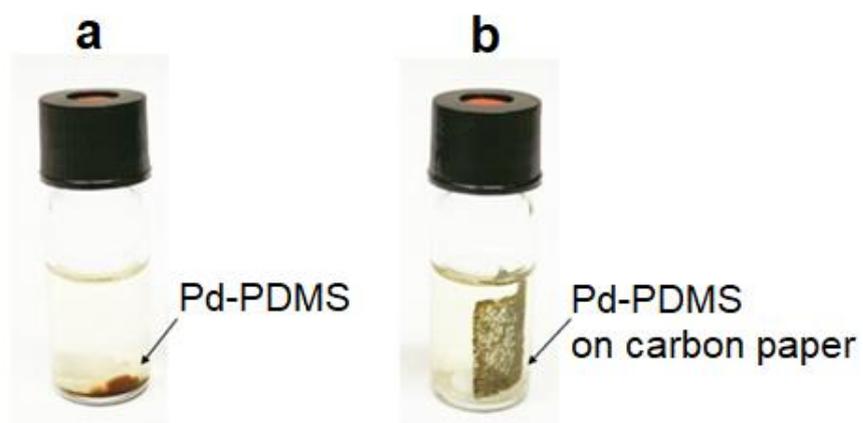
**Figure S3.** HRESI<sup>+</sup> mass spectrum of CMP complex.



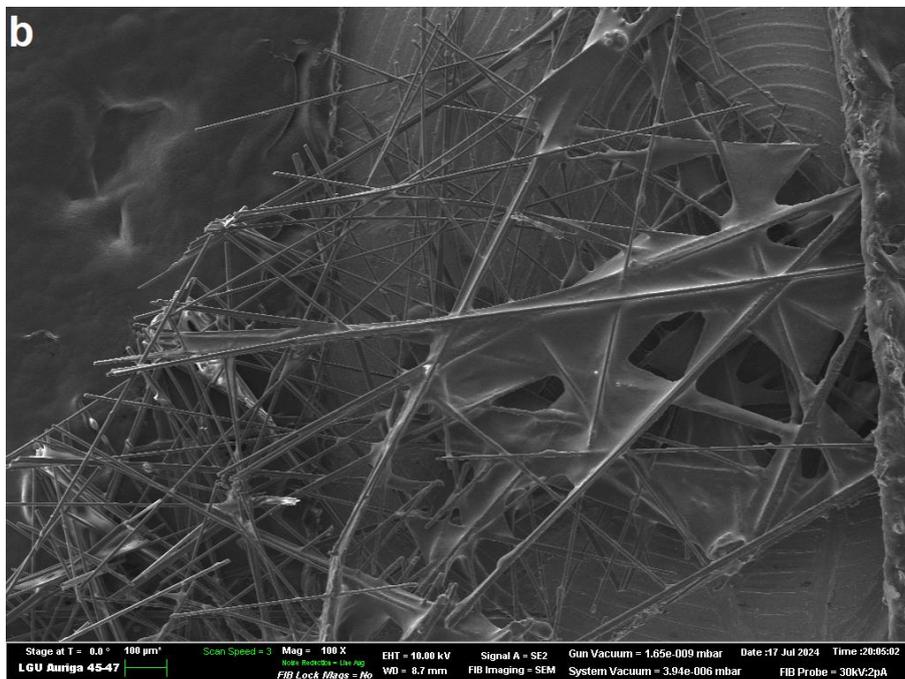
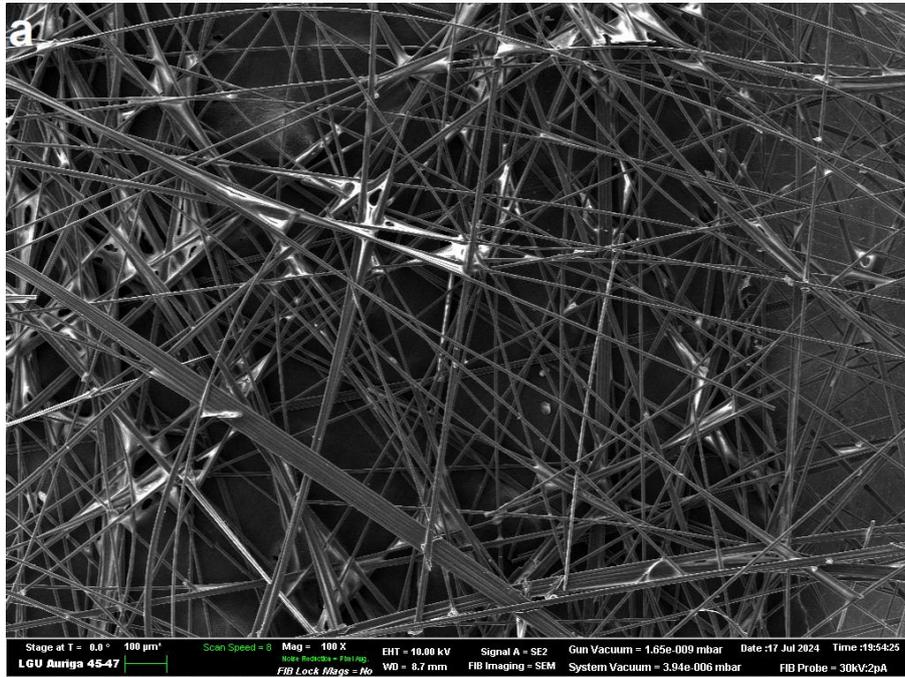
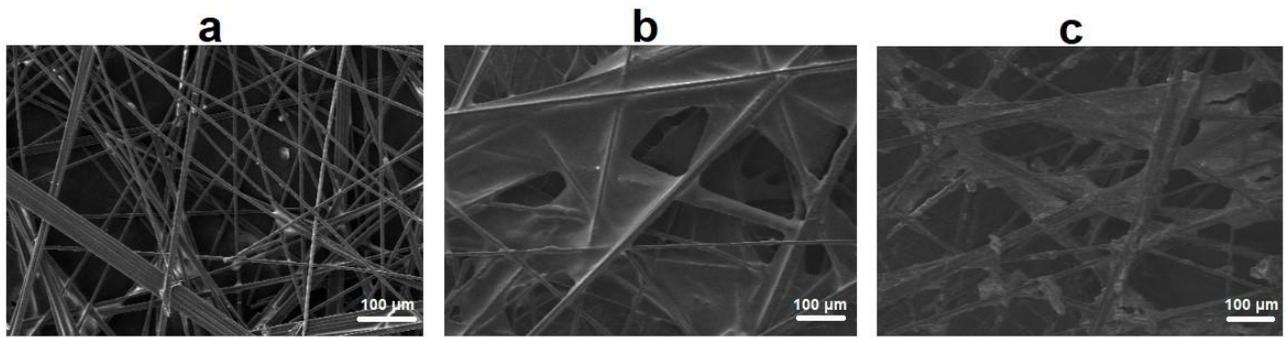
**Figure S4.** XPS survey spectrum (a) and Pd 3d core level spectrum (b) of CMP.

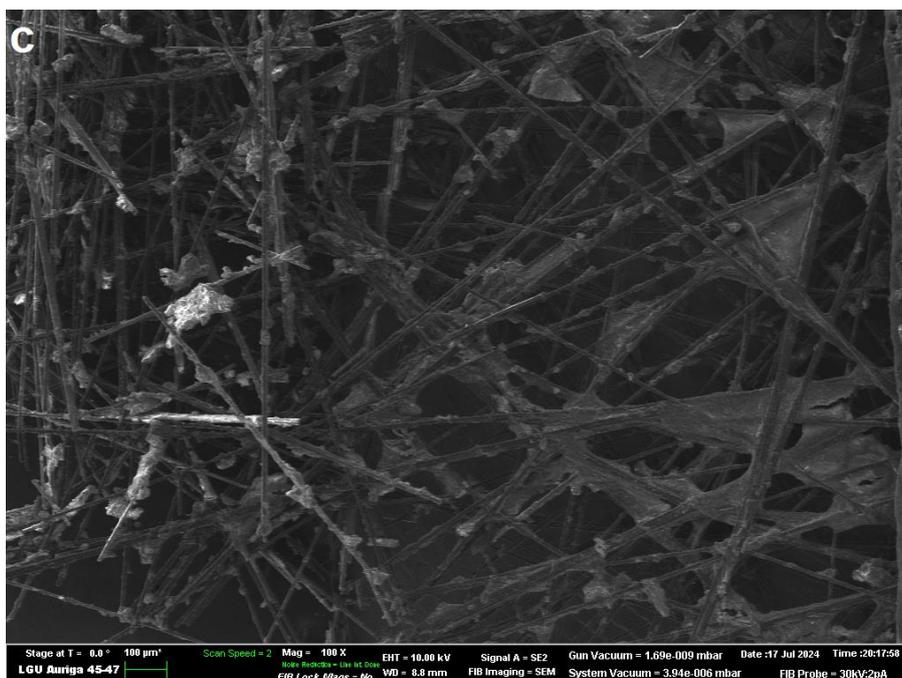
## S2. Catalytic performance of Pd-PDMS

### S2.1. Reaction conditions for Suzuki–Miyaura reaction in the presence of Pd-PDMS



**Figure S5.** Pd-PDMS applied on walls of a vial (a), Pd-PDMS on carbon paper (CP) (b).





**Figure S6.** SEM images of pure CP (a), Pd-PDMS on CP before reaction (b) and Pd-PDMS on CP after reaction (c).

### S2.2. Suzuki–Miyaura cross-coupling between 4-bromotoluene and phenylboronic acid

Prior to use commercially available 4-bromotoluene and phenylboronic acid were analyzed by  $^1\text{H}$  NMR spectroscopy and their chemical shifts are as follows:

4-bromotoluene  $^1\text{H}$  NMR ( $\text{CDCl}_3$ ,  $\delta$ ): 7.40 (d, 2H,  $J = 8.2$  Hz), 7.07 (d, 2H,  $J = 8.2$  Hz), 2.33 (s, 3H,  $\text{CH}_3$ ).

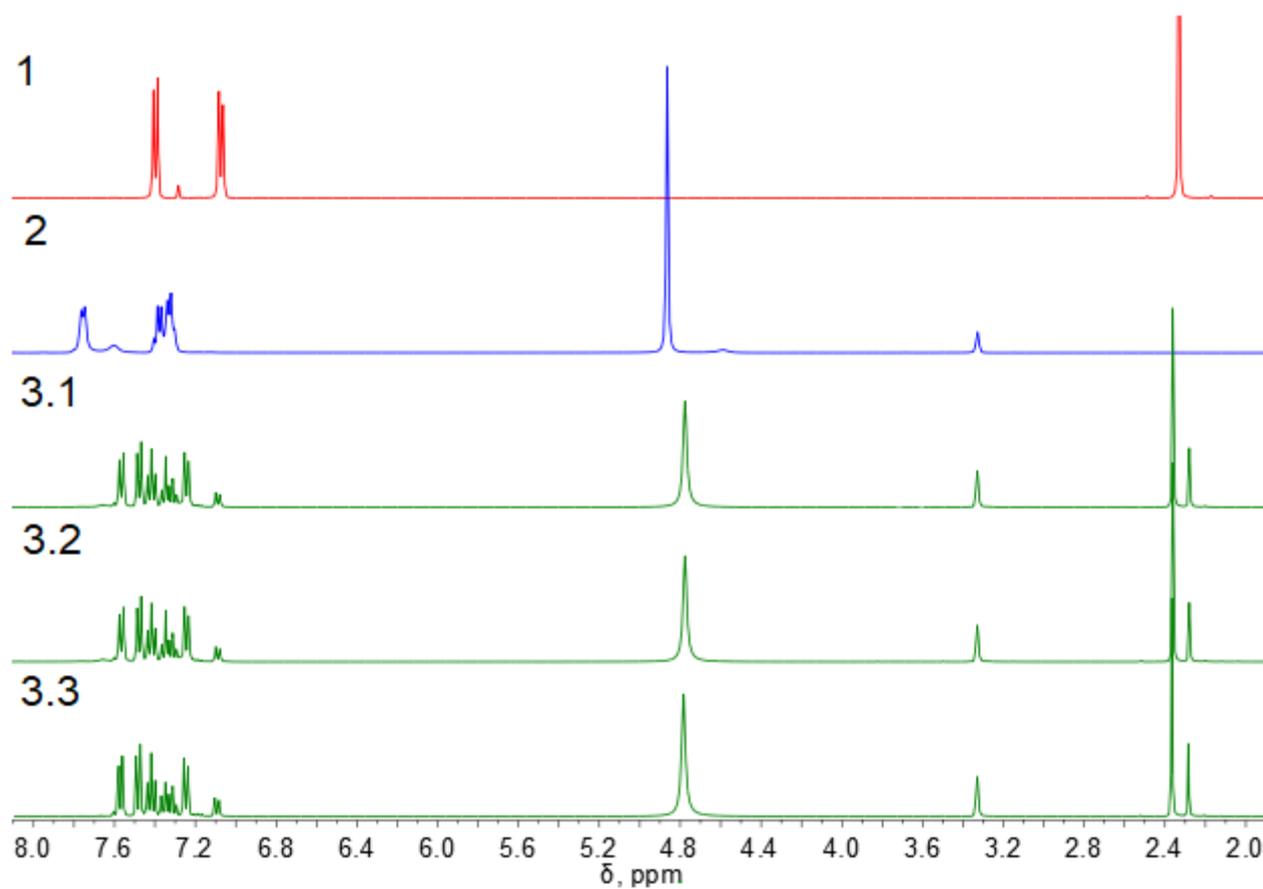
Phenylboronic acid  $^1\text{H}$  NMR ( $\text{DMSO}-d_6$ ,  $\delta$ ): 7.99 (s, 2H), 7.78 (dd, 2H,  $J_1 = 6.6$  Hz,  $J_2 = 1.5$  Hz), 7.39 (m, 1H), 7.32 (m, 2H).

To monitor chemical shifts in Suzuki–Miyaura (SM) reaction phenylboronic acid  $^1\text{H}$  NMR spectrum was also registered in methanol- $d_4$ .

Phenylboronic acid  $^1\text{H}$  NMR (methanol- $d_4$ ,  $\delta$ ): 7.76 (d, 2H,  $J_1 = 6.6$  Hz), 7.36 (m, 4H).

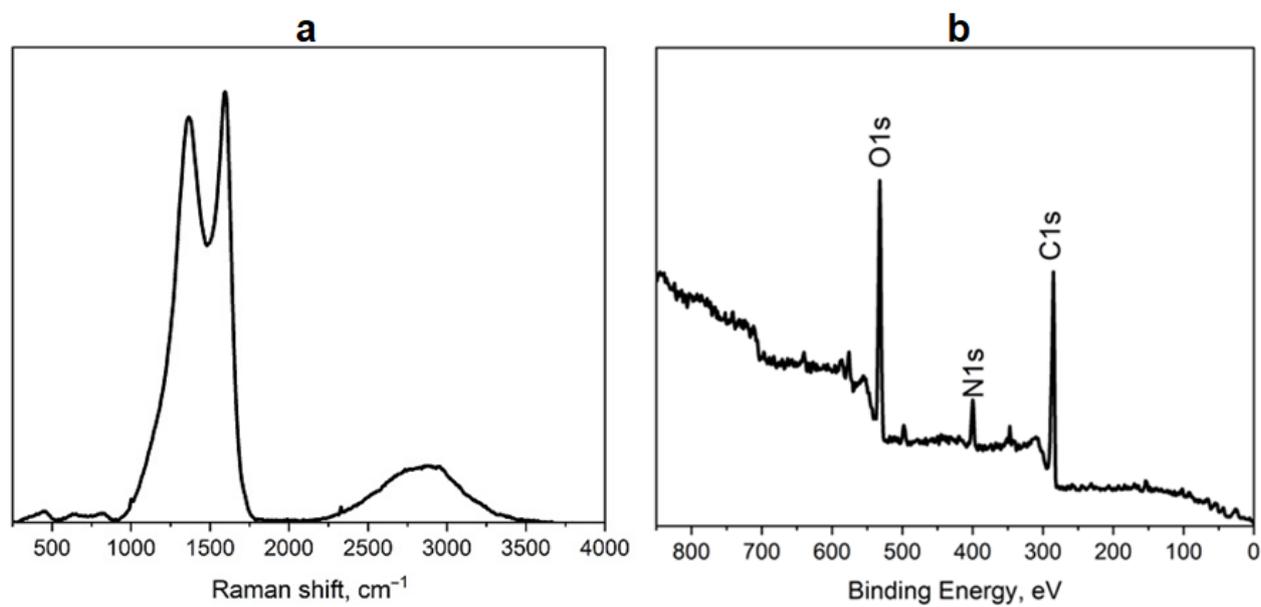
$^1\text{H}$  NMR data for 4-methylbiphenyl were compared with those reported in literature [1].

4-methylbiphenyl  $^1\text{H}$  ( $\text{CDCl}_3$ ,  $\delta$ ): 2.49 (s, 3H,  $\text{CH}_3$ ), 7.35 (d,  $J = 8.0$  Hz, 2H), 7.37–7.46 (m, 1H), 7.48–7.56 (m, 2H), 7.60 (d,  $J = 8.1$  Hz, 2H), 7.68 (d,  $J = 7.5$  Hz, 2H).



**Figure S7.** <sup>1</sup>H NMR spectra in a range from 1.75 to 8.25 ppm of 4-bromotoluene (1), phenylboronic acid registered in methanol-*d*<sub>4</sub> (2), methylbiphenyl 1<sup>st</sup> catalytic cycle (3.1), methylbiphenyl 2<sup>nd</sup> catalytic cycle (3.2), methylbiphenyl 3<sup>rd</sup> catalytic cycle (3.3).

### S3. Carbon paper characterization



**Figure S8.** Spectra of the carbon paper used in in catalytic experiments: Raman (a) and XPS survey (b) spectra.

References:

1. Leadbeater, N.E.; Marco, M. Transition-Metal-Free Suzuki-Type Coupling Reactions. *Angew. Chem. Int. Ed.* **2003**, *42*, 1407–1409, doi:10.1002/anie.200390362.