Supporting Information

Incorporation of CuO NPs into the modified UiO-66-NH_2 metal-organic frameworks (MOFs) with melamine for catalytic C−O coupling in the Ullmann condensation

Samira Sadeghi,[1]Mohammad Jafarzadeh,[1*]Amir Reza Abbasi,[1] Kim Daasbjerg[2,3]

[1]Faculty of Chemistry, Razi University, Kermanshah 67149-67346, Iran

[2]Department of Chemistry, Aarhus University, Langelandsgade 140, 8000 Aarhus C, Denmark

[3]Interdisciplinary Nanoscience Center (iNANO), Aarhus University, Gustav Wieds Vej 14, 8000 Aarhus C, Denmark

*Corresponding author (M. Jafarzadeh): Email: mjafarzadeh1027@yahoo.com

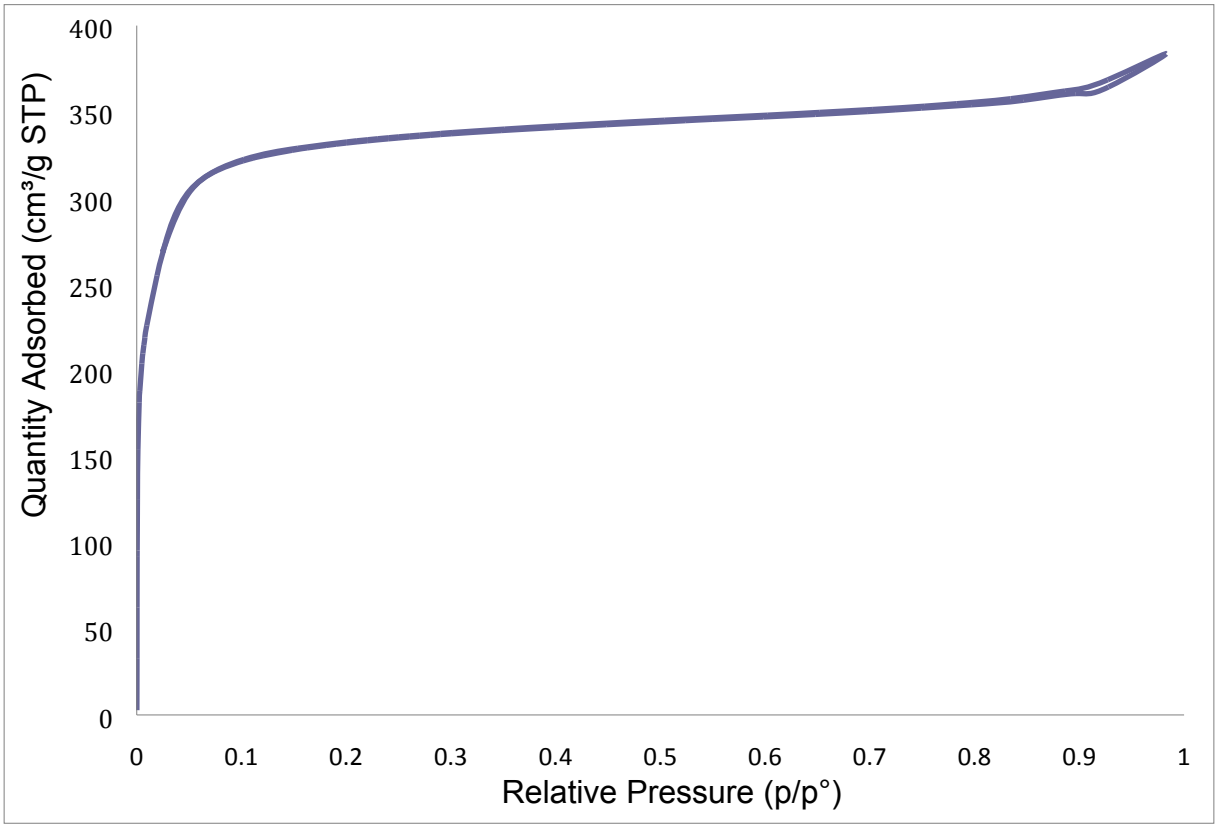


Figure S1. N_2 adsorption-desorption isotherm of UiO-66-NH_2.

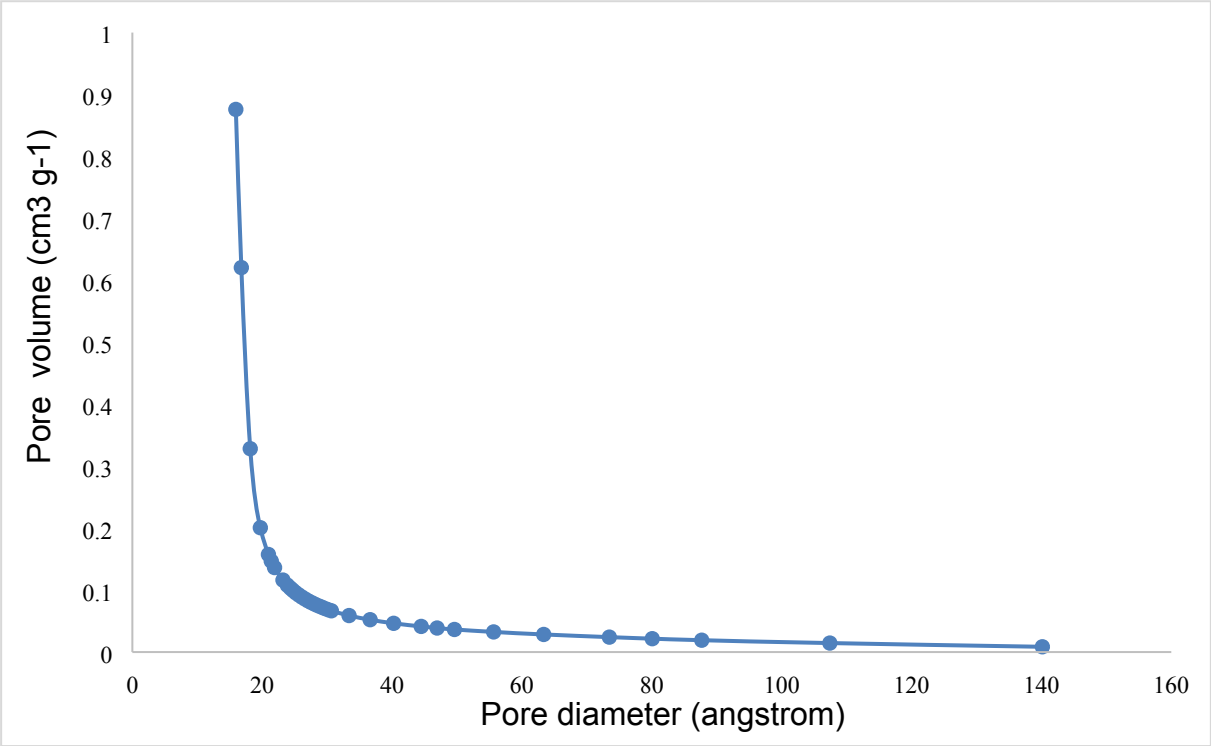


Figure S2. Pore volume distribution of UiO-66-NH_2.

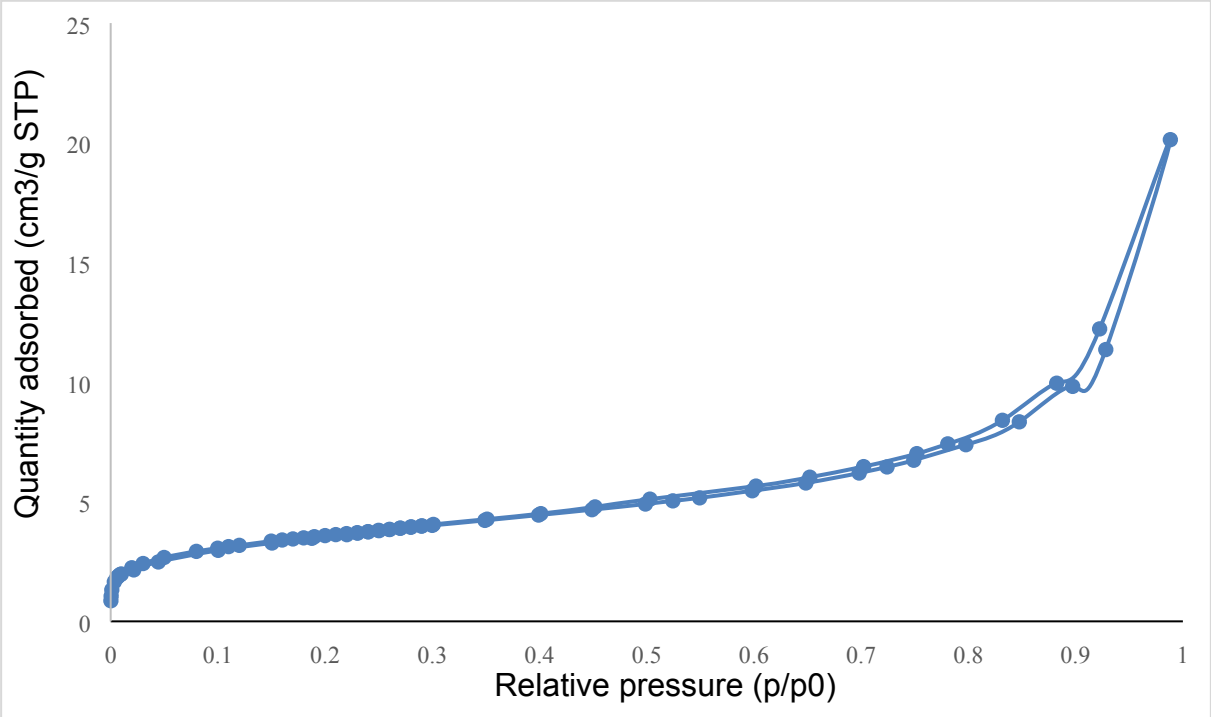


Figure S3. N_2 adsorption-desorption isotherm for reused UiO-66-NH_2-Mlm/CuO.

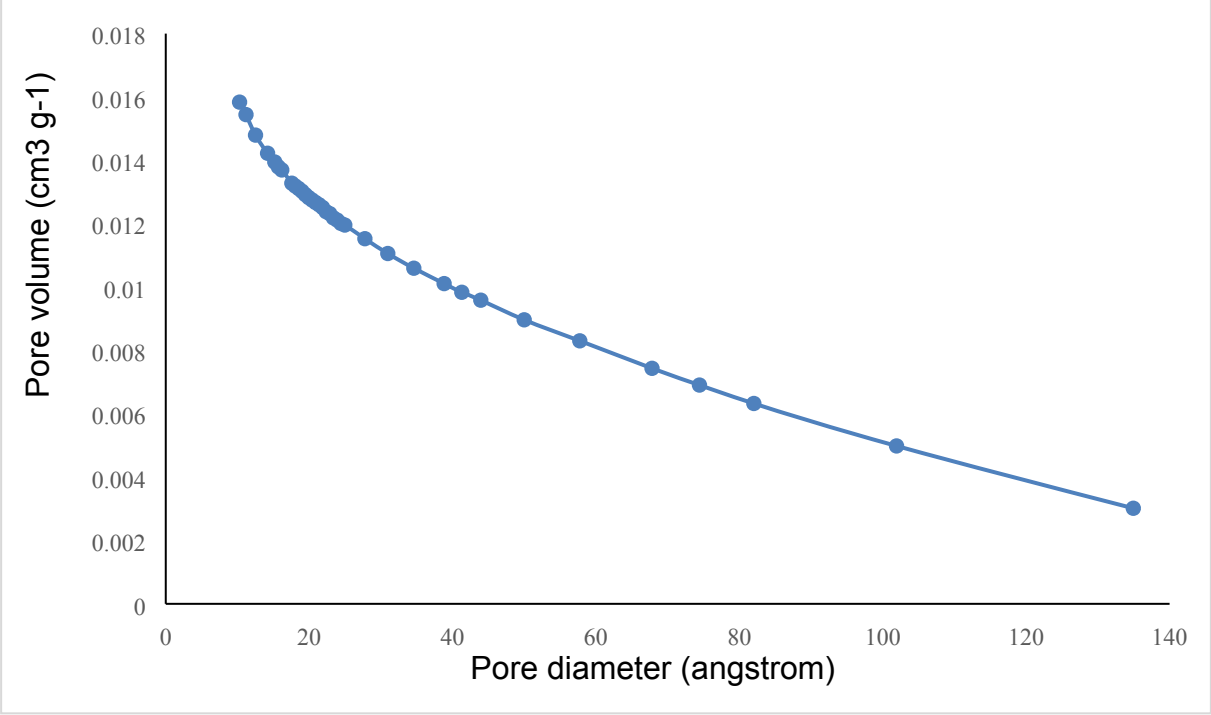


Figure S4. Pore volume distribution for reused UiO-66-NH_2-Mlm/CuO.

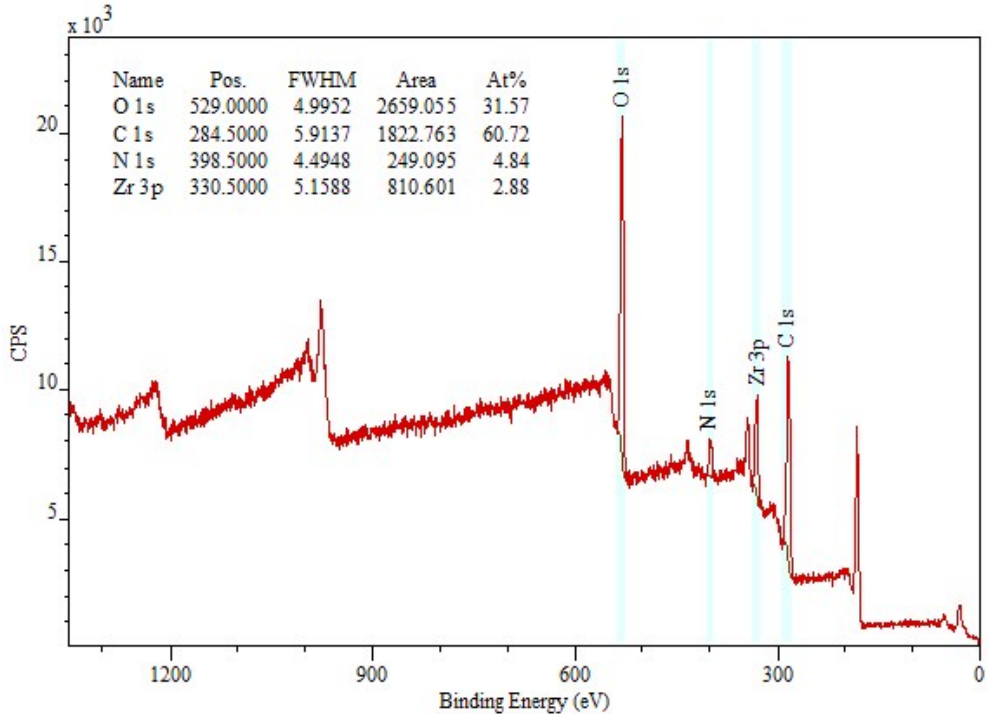


Figure S5. XPS survey of UiO-66-NH_2.

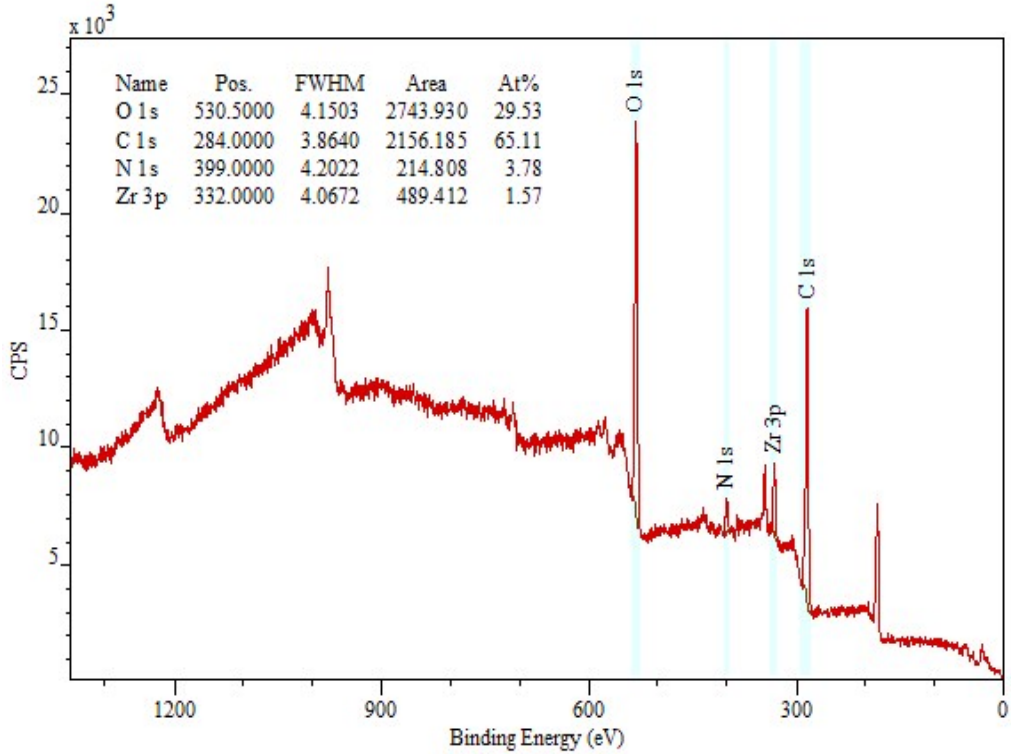


Figure S6. XPS survey of UiO-66-NH_2-Mlm.

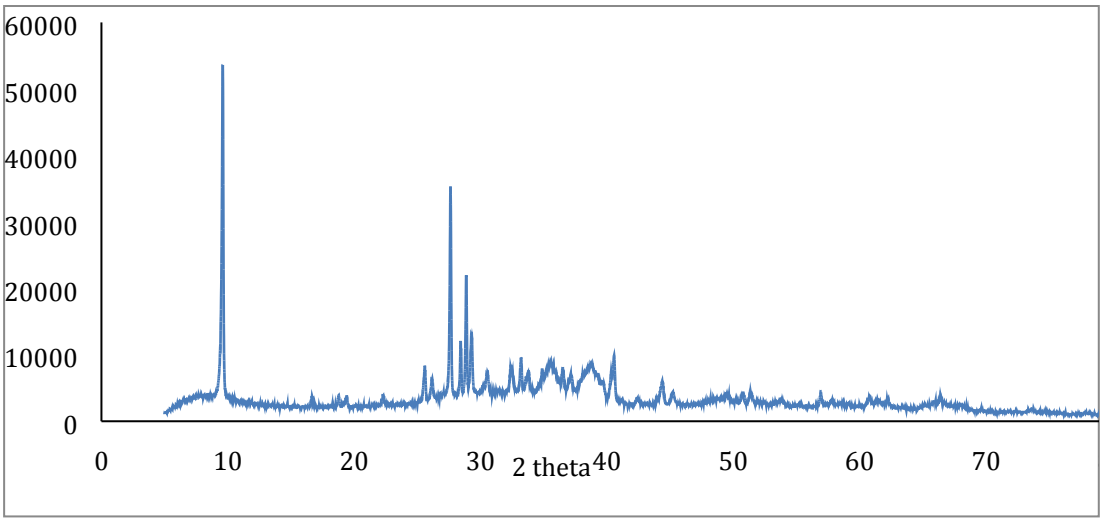


Figure S7. XRD patterns of reused UiO-66-NH_2-Mlm/CuO.

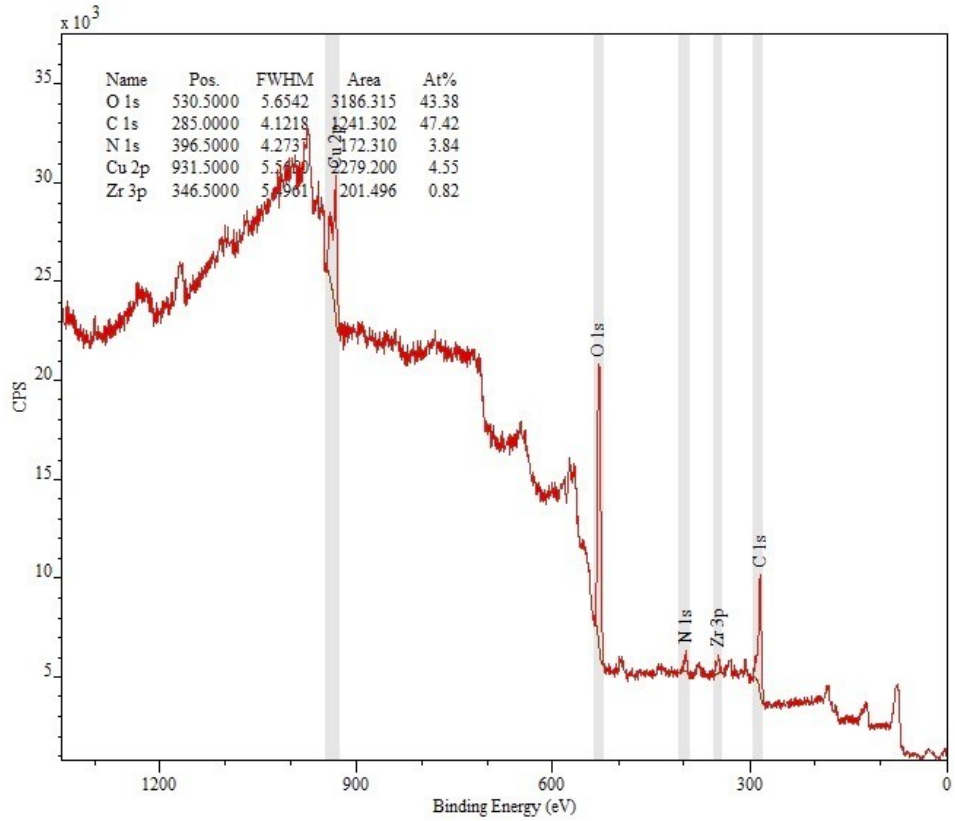
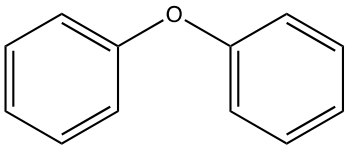
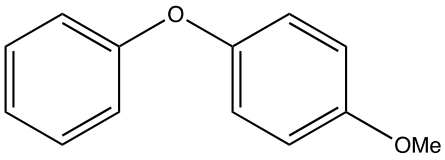


Figure S8. XPS survey of reused UiO-66-NH_2-Mlm/CuO.

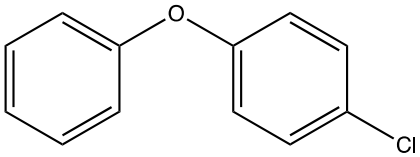
NMR data of the products:



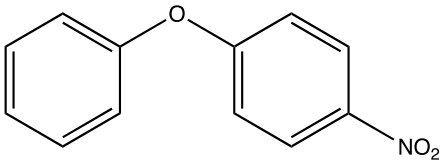
Oxydibenzene: ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.37 (t, 4 H), 7.14 (t, 2H), 7.05 (d, 4 H). ^{13}C NMR (100 MHz, $CDCl_3$): δ = 157.2, 129.7, 123.2, 118.9.



1-Methoxy-4-phenoxybenzene: ^{1}H NMR (400 MHz, $CDCl_3$): δ =7.32-7.25 (m, 4 H), 7.11-6.90 (m, 5 H), 3.80 (s, 3 H). ^{13}C NMR (100 MHz, $CDCl_3$): δ = 157.2, 155.4, 151.1, 128.5, 121.5, 119.8, 118.8, 114.3, 55.8.



1-Chloro-4-phenoxybenzene: ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.52-7.40 (m, 4 H), 7.30-6.99 (m, 5 H). ^{13}C NMR (100 MHz, $CDCl_3$): δ = 157.0, 155.5, 129.6, 128.8, 128.2, 122.7, 119.7, 118.9.



1-Nitro-4-phenoxybenzene: ^{1}H NMR (400 MHz, $CDCl_3$): δ =8.21-7.41 (m, 4 H), 7.38-7.06 m, 5 H). ^{13}C NMR (100 MHz, $CDCl_3$): δ = 157.4, 149.8, 138.6, 128.3, 124.4, 122.8, 118.9, 116.5.

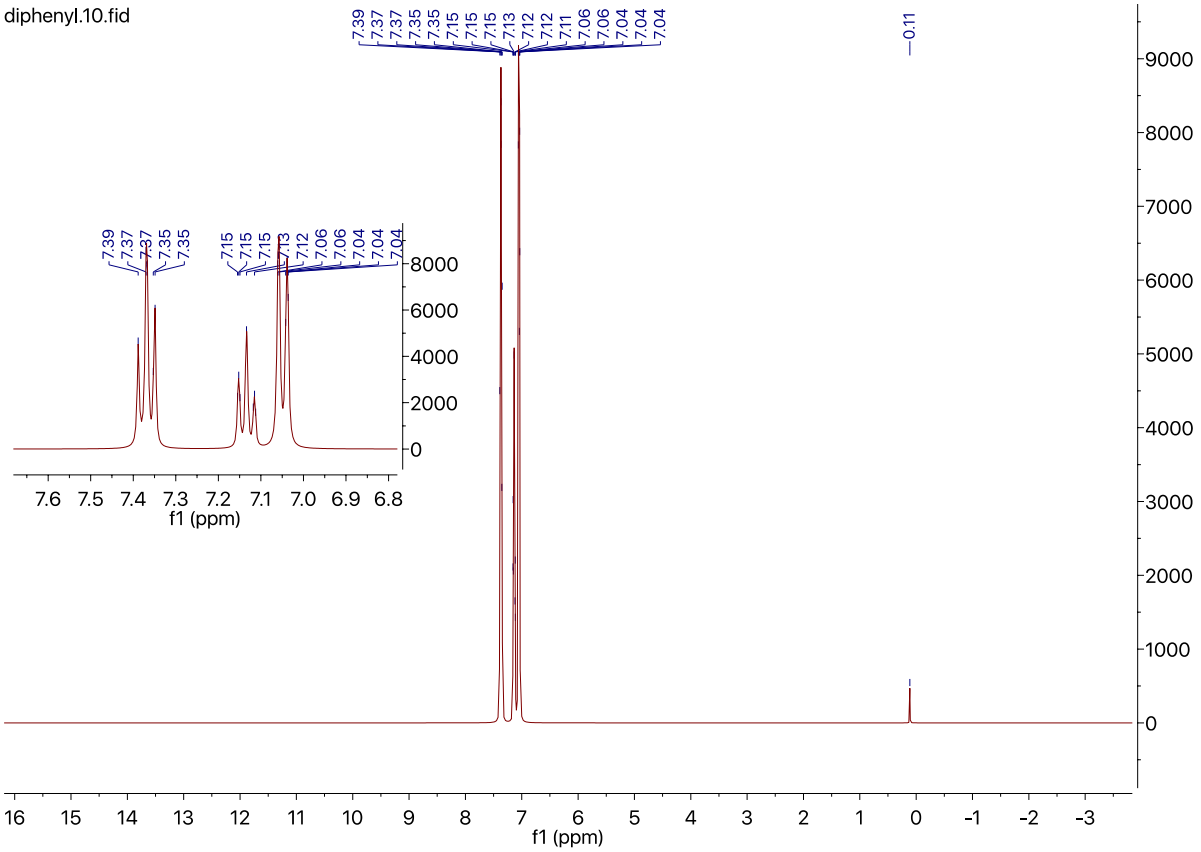


Figure S9. ^{1}H NMR for the diphenyl ether obtained from the model reaction.

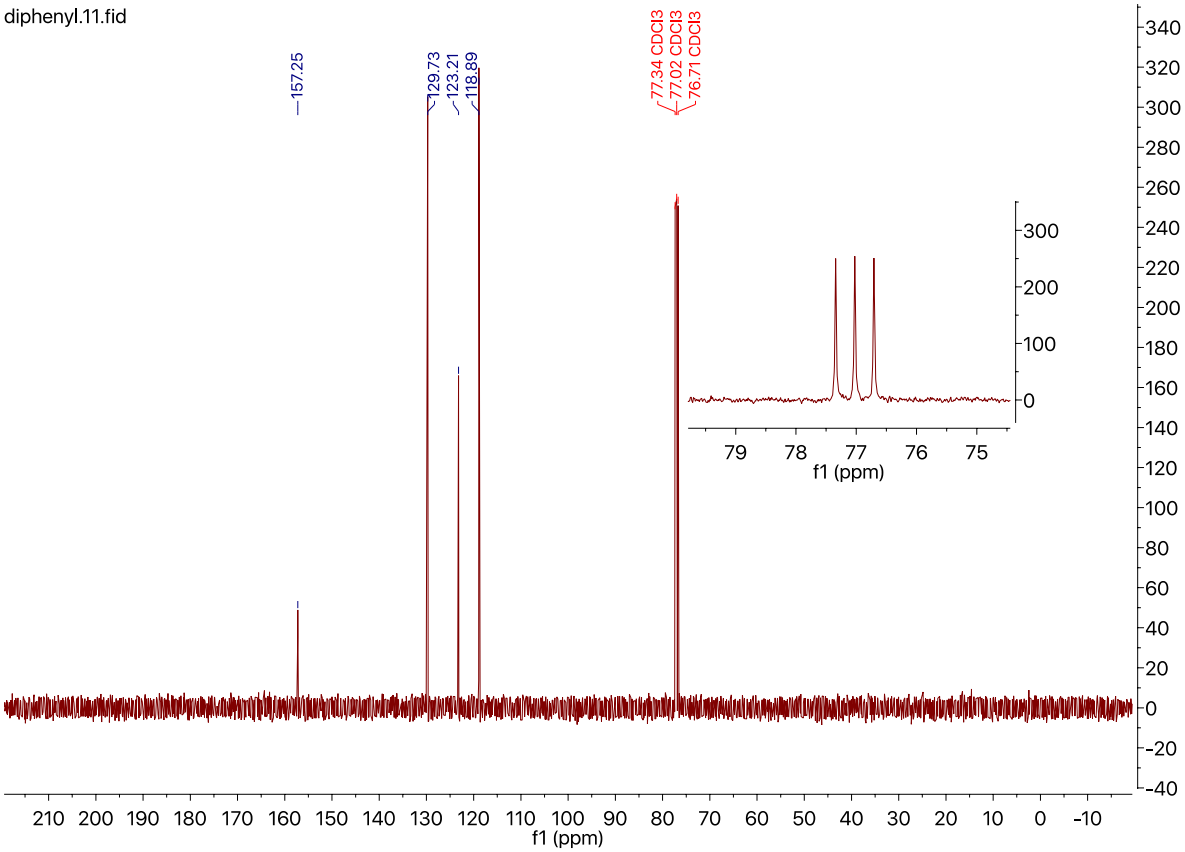


Figure S10. ^{13}C NMR for the diphenyl ether obtained from the model reaction.