Supporting Information for

# Water Oxidation Mediated by Ruthenium Oxide Nanoparticles Supported on Mesocellular Siliceous Foam

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## Nitrogen Adsorption/Desorption Isotherm Analysis

**Table S1.** Surface area, pore volume, and pore size determined by nitrogen adsorption/desorption isotherm analysis of PPU-MCF and $RuO_2$-PPU-MCF.

| | PPU-MCF | $RuO_2$-PPU-MCF |
|---|---|---|
| **Surface area** | | |
| Single point surface area at p/p° = 0.179020747 | 303.4151 $m^2\ g^{-1}$ | 319.2427 $m^2\ g^{-1}$ |
| BET Surface Area | 330.9577 $m^2\ g^{-1}$ | 341.1458 $m^2\ g^{-1}$ |
| BJH Adsorption cumulative surface area of pores between 17.000 Å and 3000.000 Å width | 311.071 $m^2\ g^{-1}$ | 287.109 $m^2\ g^{-1}$ |
| BJH Desorption cumulative surface area of pores between 17.000 Å and 3000.000 Å width | 577.6956 $m^2\ g^{-1}$ | 478.3972 $m^2\ g^{-1}$ |
| **Pore Volume** | | |
| Single point adsorption total pore volume of pores less than 1092.808 Å width at p/p° = 0.981958152 | 1.505032 $cm^3\ g^{-1}$ | 1.479544 $cm^3\ g^{-1}$ |
| BJH Adsorption cumulative volume of pores between 17.000 Å and 3000.000 Å width | 1.441211 $cm^3\ g^{-1}$ | 1.408394 $cm^3\ g^{-1}$ |
| BJH Desorption cumulative volume of pores between 17.000 Å and 3000.000 Å width | 1.507425 $cm^3\ g^{-1}$ | 1.482386 $cm^3\ g^{-1}$ |
| **Pore Size** | | |
| Adsorption average pore width (4V/A by BET): | 181.9003 Å | 173.4794 Å |
| BJH Adsorption average pore width (4V/A) | 185.322 Å | 196.217 Å |
| BJH Desorption average pore width (4V/A): | 104.375 Å | 123.946 Å |

## XPS Spectra

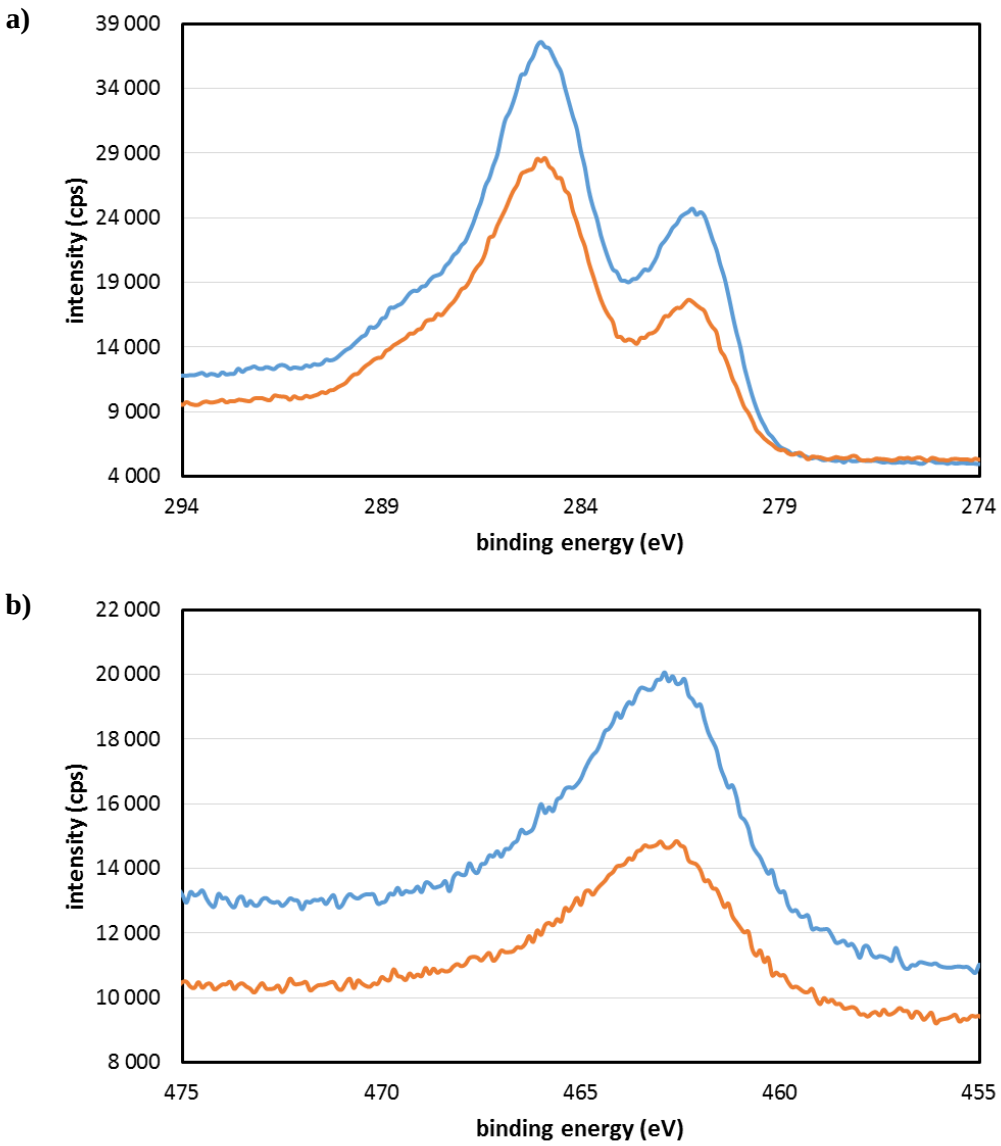


**Figure S1.** Comparison of XPS spectra of (a) the Ru $3d^{5/2}$ and (b) the Ru $3p^{3/2}$ core level region of unused $RuO_2$ nanocatalyst (—) and recovered catalyst (—).

## HAADF-STEM Characterization of the $RuO_2$ Nanocatalyst

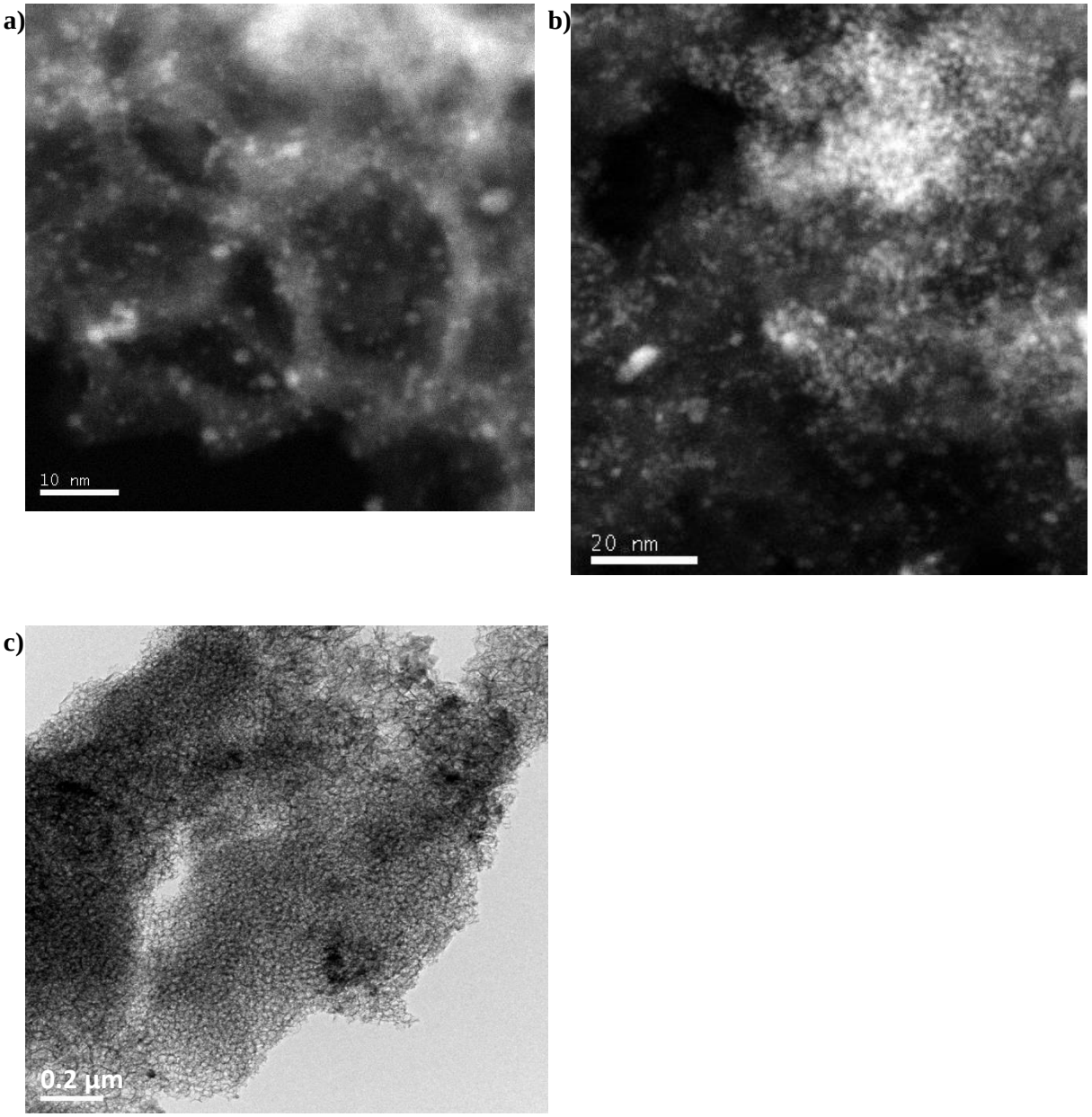


**Figure S2.** HAADF-STEM images of the unused $RuO_2$ nanocatalyst. (a) with 10 nm scale bar. (b) with 20 nm scale bar. (c) with 0.2 µm scale bar.

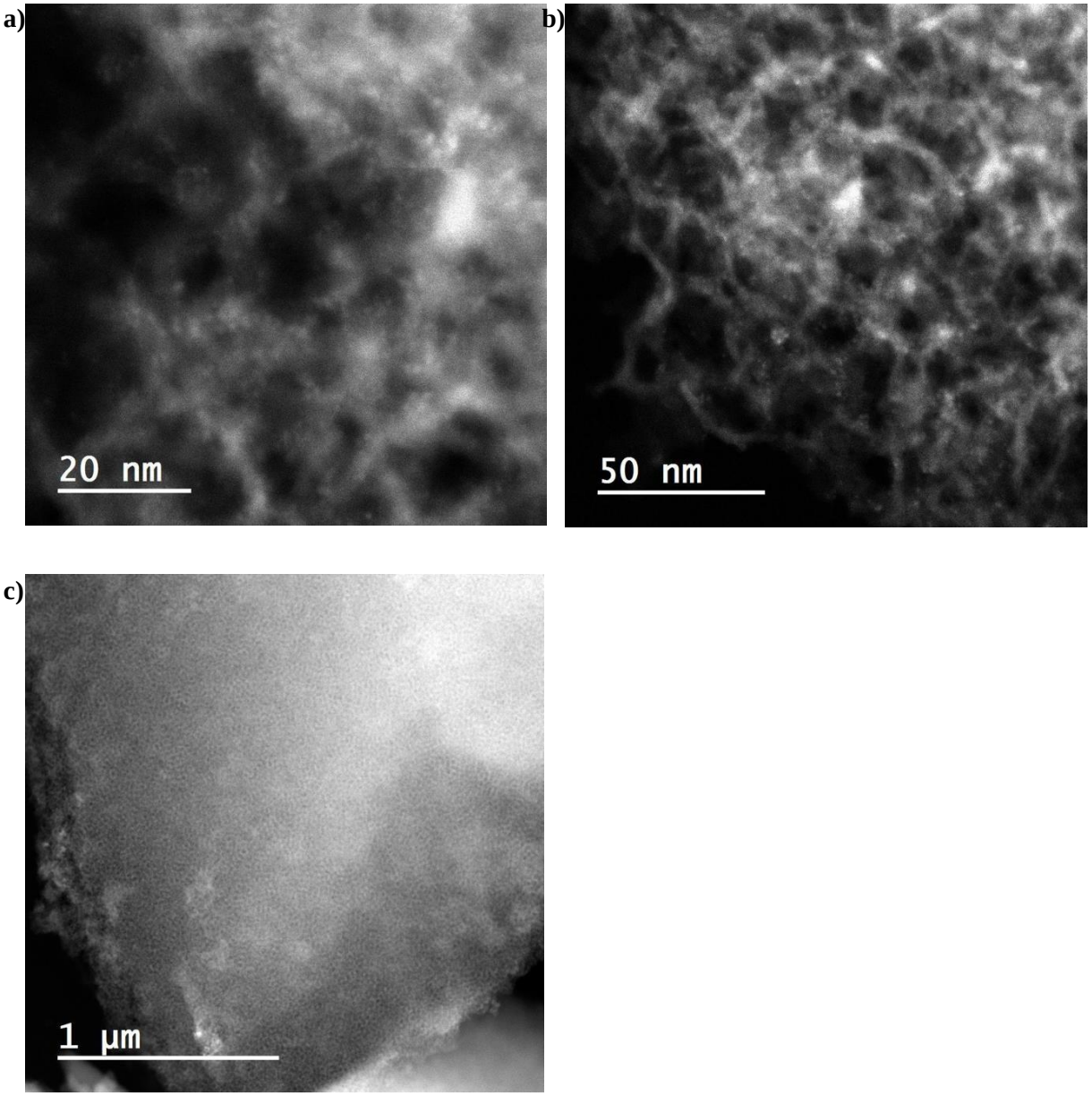


**Figure S3.** HAADF-STEM images of recovered $RuO_2$ nanocatalyst. (a) with 20 nm scale bar. (b) with 50 nm scale bar. (c) with 1.0 µm scale bar.

**Particle size distribution of the recovered $RuO_2$ Nanocatalyst**

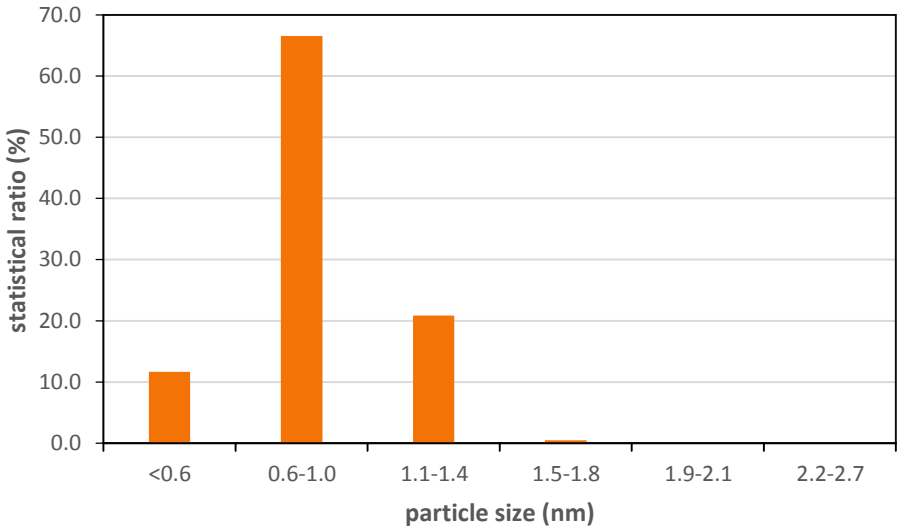


**Figure S4.** Graph of particle size distribution of recovered $RuO_2$ nanocatalyst.

**NMR Spectra**

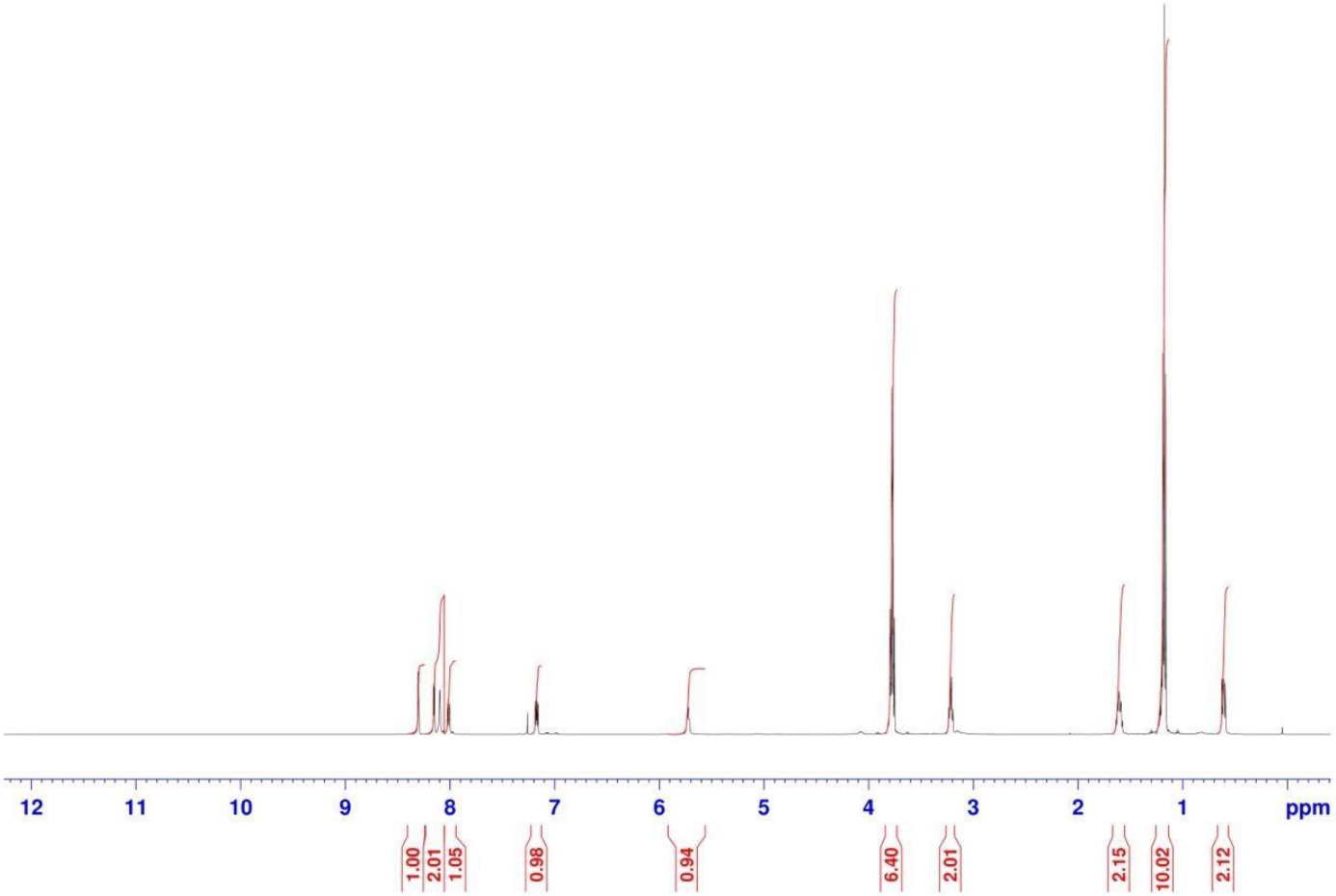


**Figure S5.** $^{1}$H NMR spectrum of 1-(pyridin-3-yl)-3-(3-(triethoxysilyl)propyl)urea (PPU).

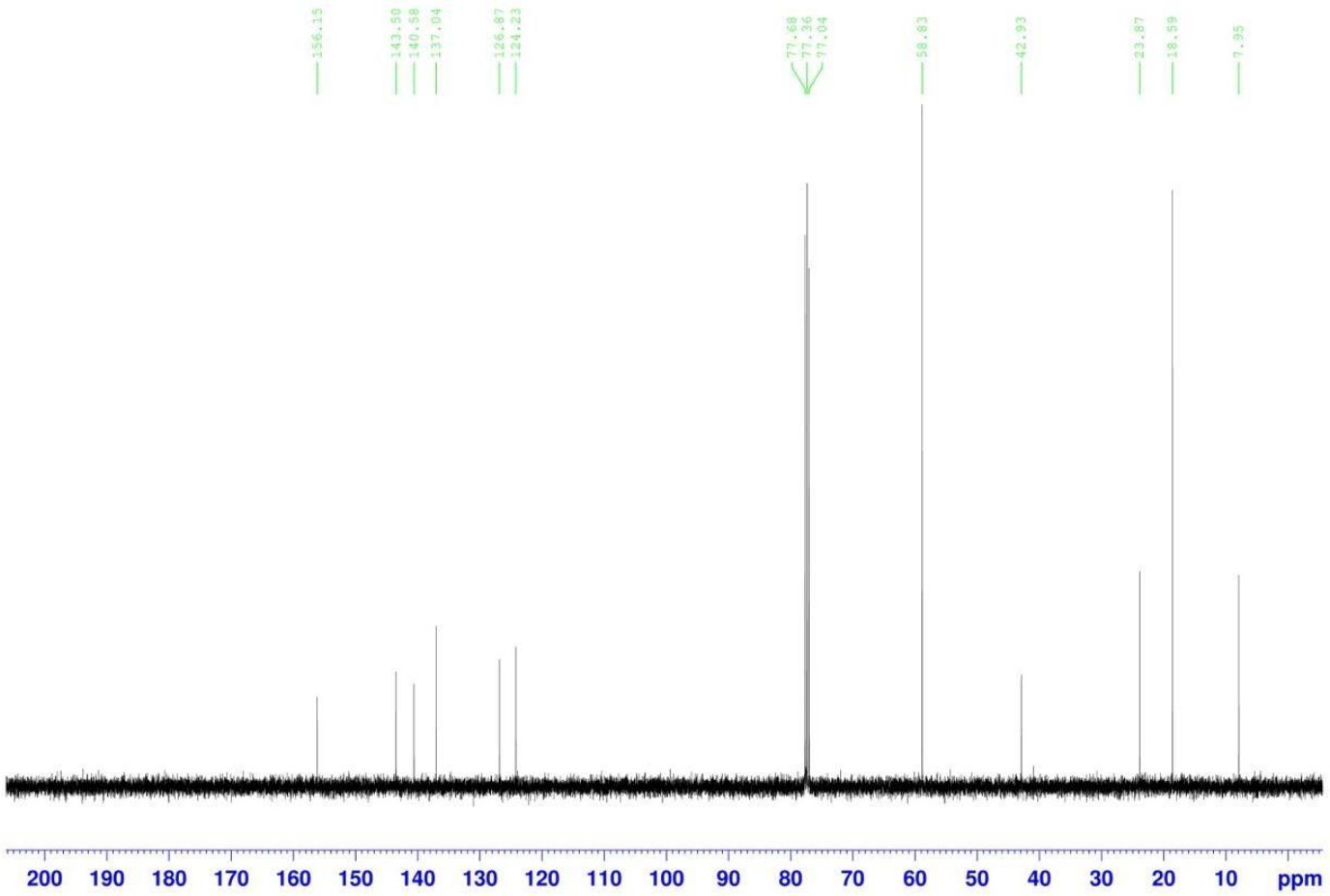


**Figure S6.** $^{13}$C NMR spectrum of 1-(pyridin-3-yl)-3-(3-(triethoxysilyl)propyl)urea (PPU).