

## Supporting Information

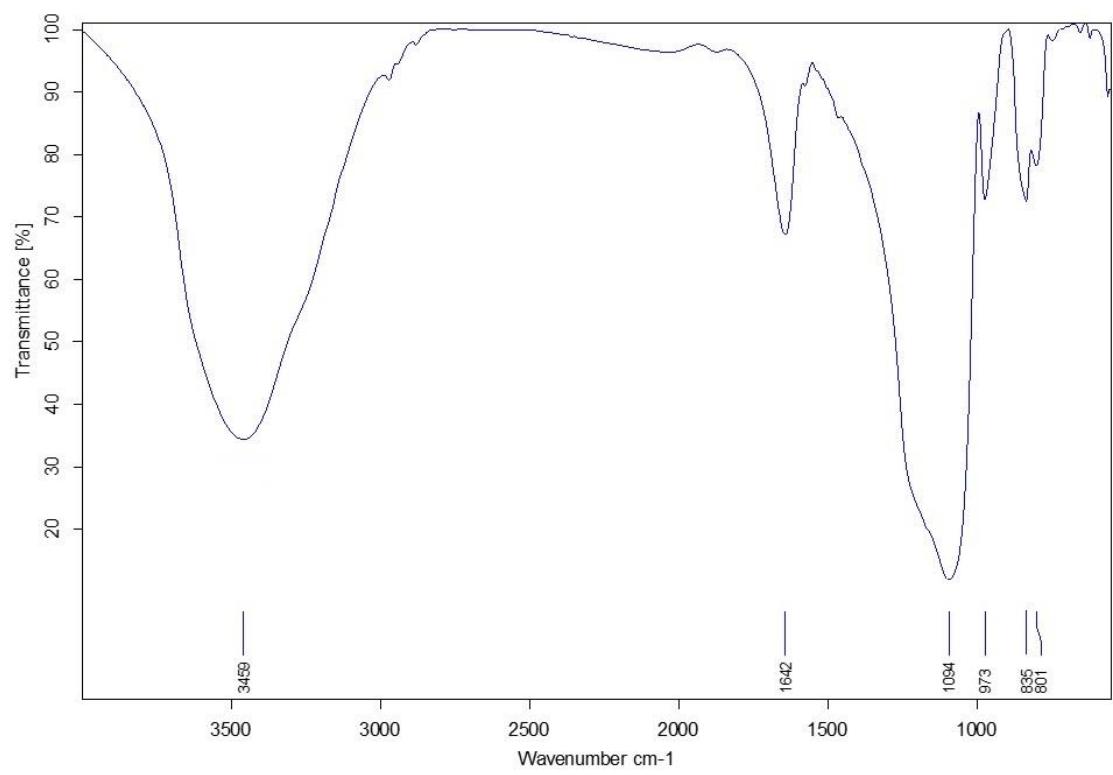
# Immobilized gold nanoparticles prepared from gold(III)-containing ionic liquids on silica: application to the sustainable synthesis of propargylamines

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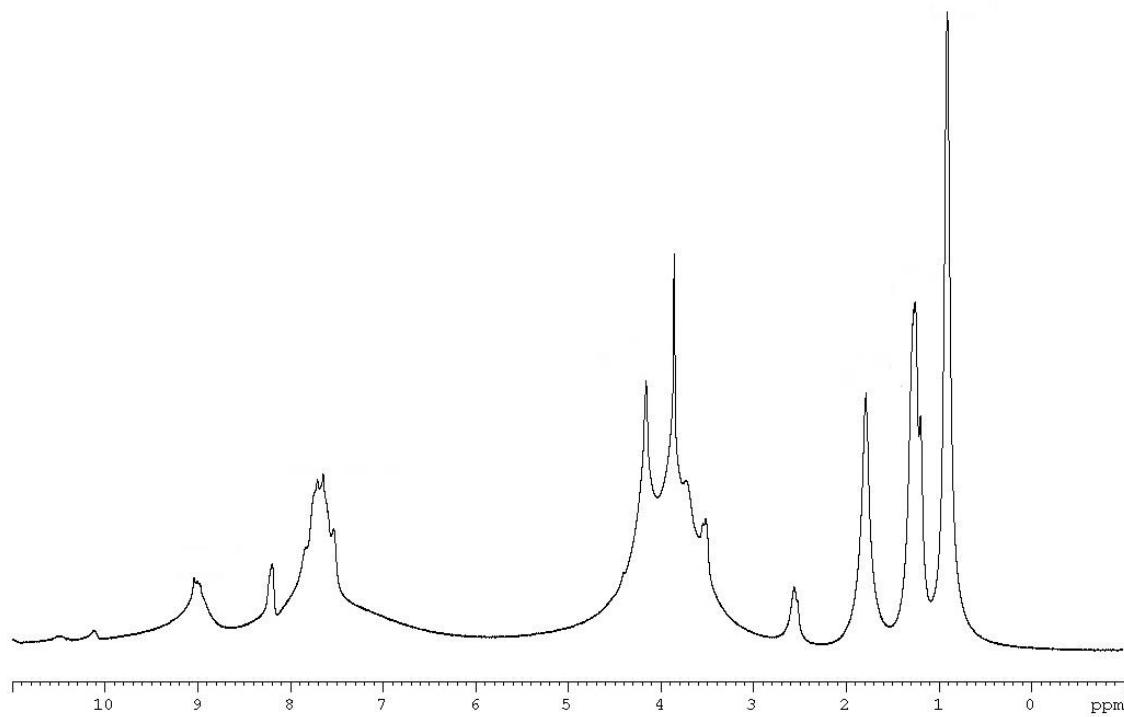
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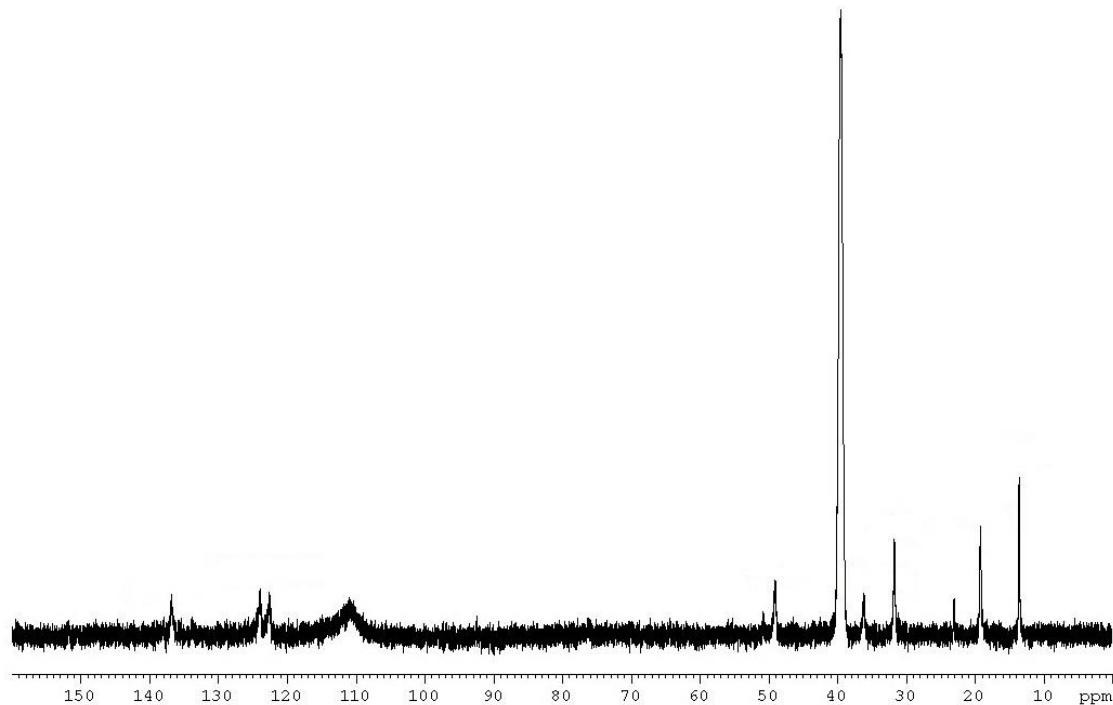
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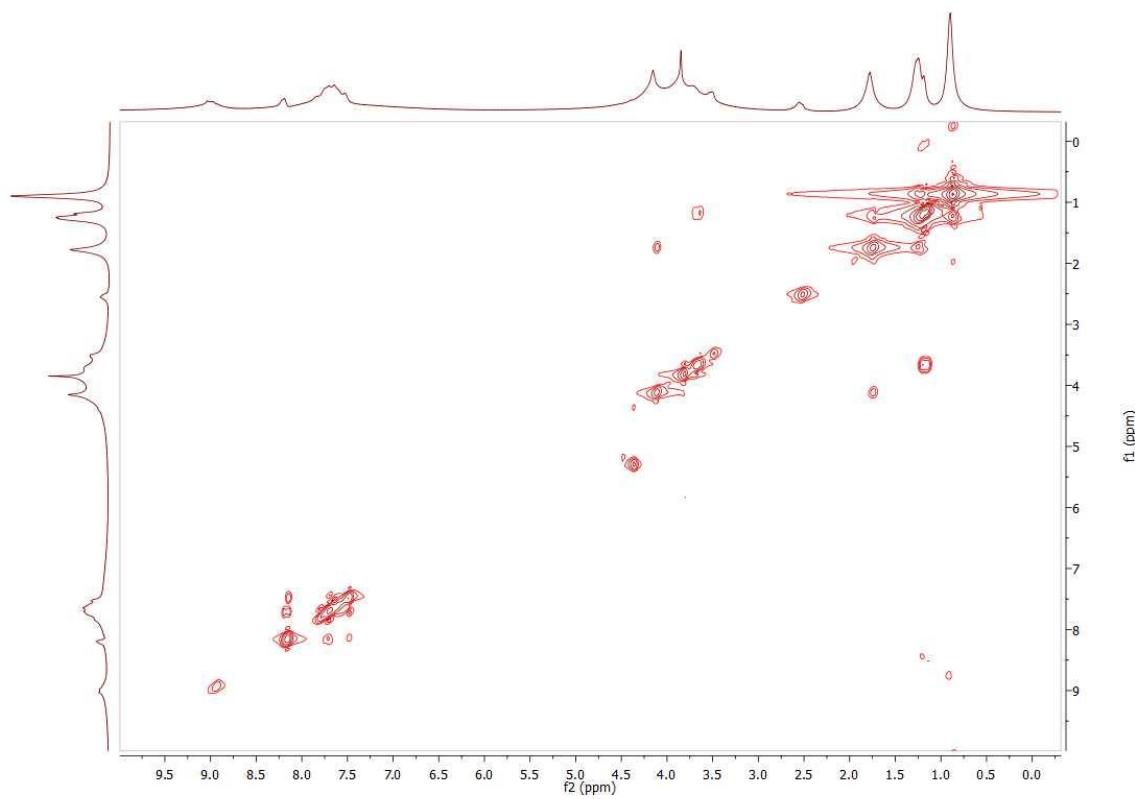
**Figure S1.** FT-IR spectrum of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>-[bmim]PF<sub>6</sub> measured in KBr.



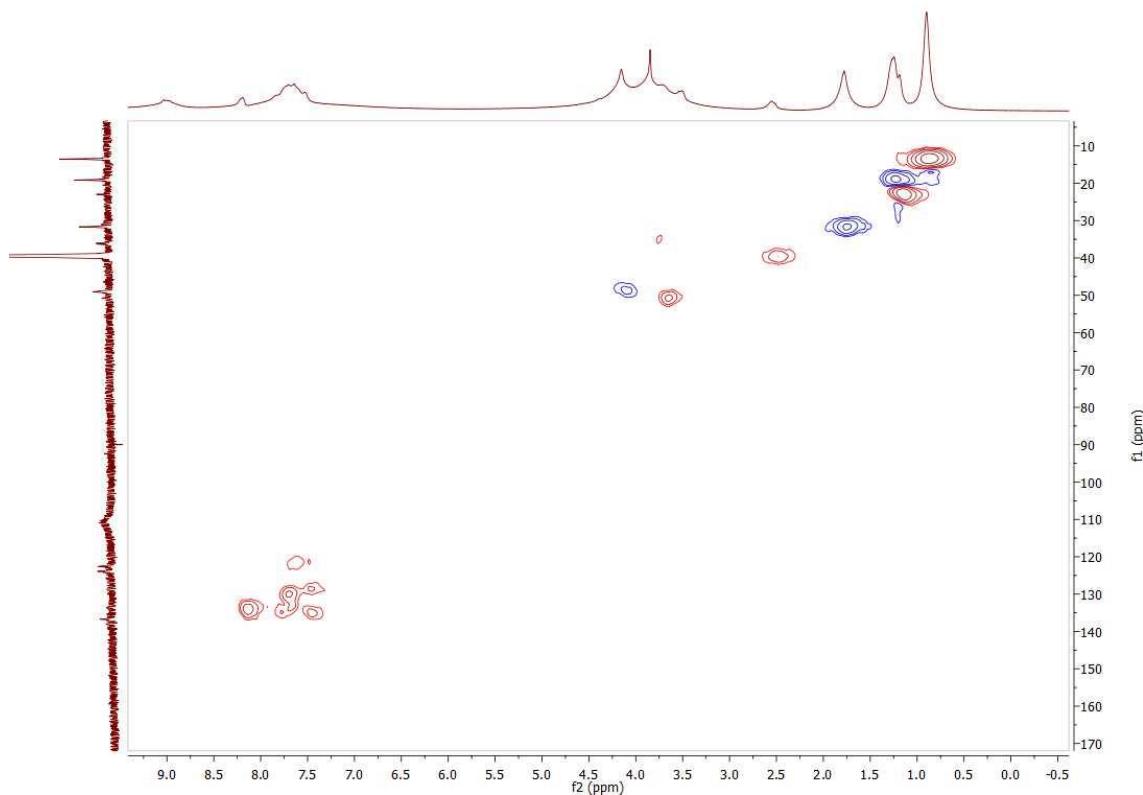
**Figure S2.** <sup>1</sup>H HRMAS NMR spectrum (500.13 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>-[bmim]PF<sub>6</sub> measured in DMSO-*d*<sub>6</sub>.



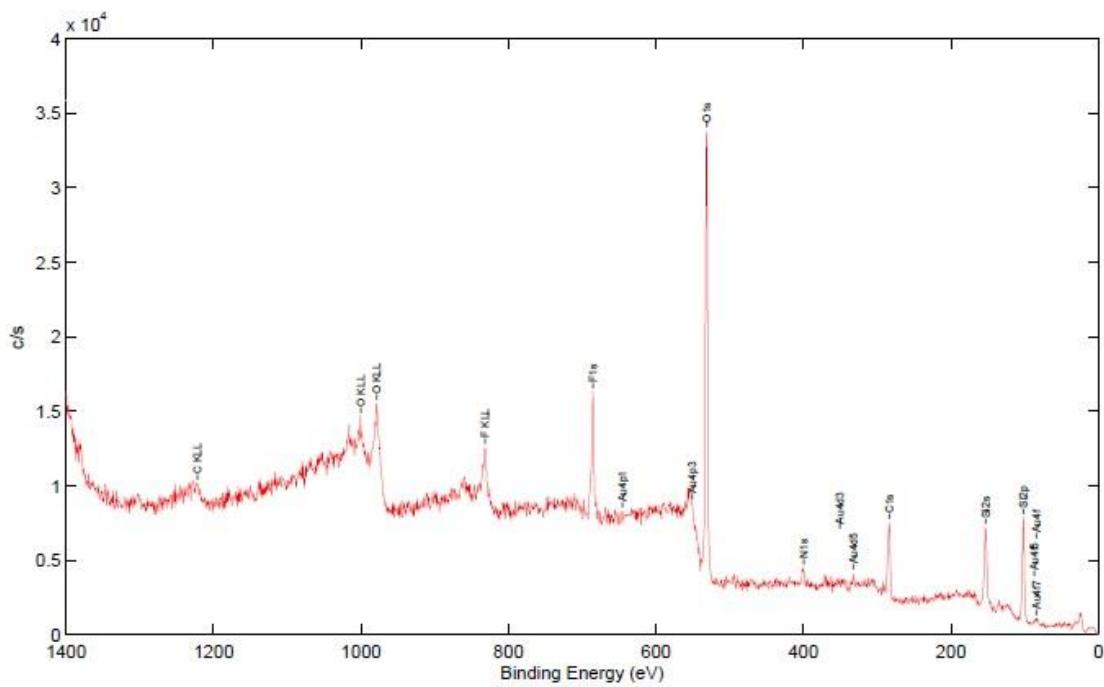
**Figure S3.** <sup>13</sup>C HRMAS NMR spectrum (125.76 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>-[bmim]PF<sub>6</sub> measured in DMSO-*d*<sub>6</sub>.



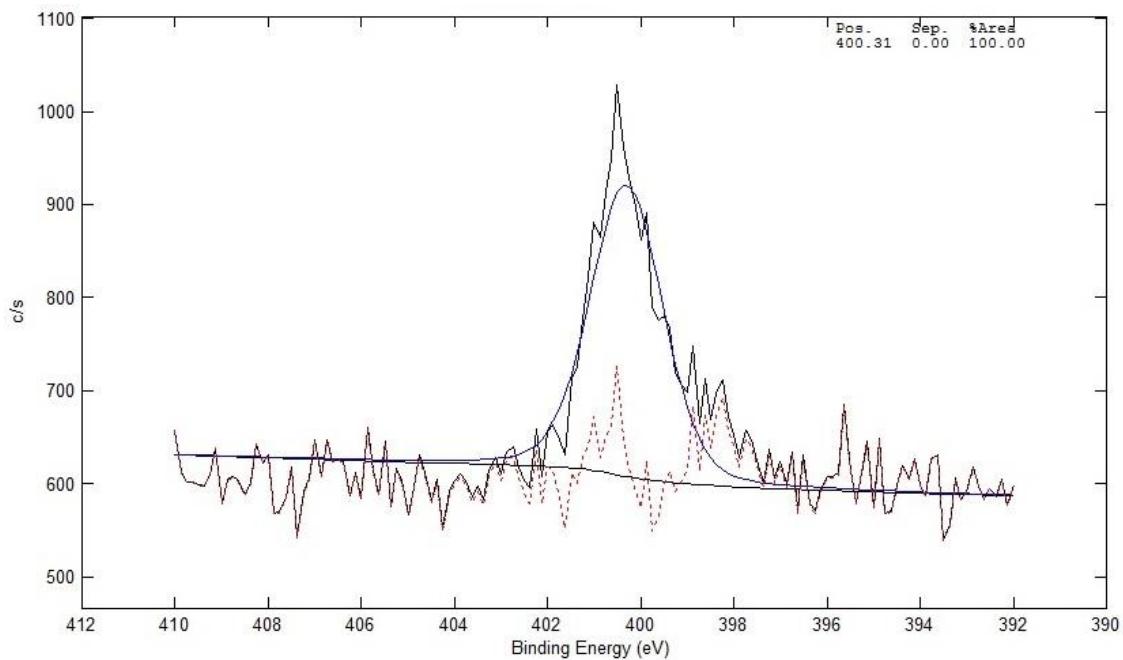
**Figure S4.**  $^1\text{H}$ , $^1\text{H}$  COSY HRMAS NMR spectrum (500.13 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>-[bmim]PF<sub>6</sub> measured in DMSO-*d*<sub>6</sub>.



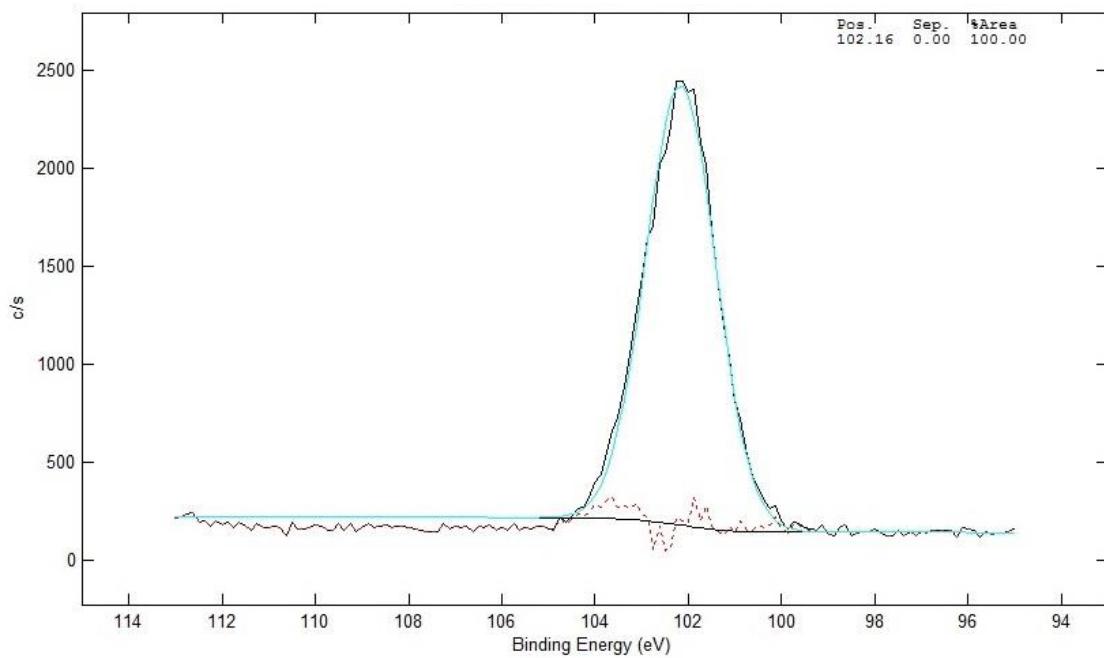
**Figure S5.** Edited  $^1\text{H}$ , $^{13}\text{C}$  HSQC HRMAS NMR spectrum (500.13 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>-[bmim]PF<sub>6</sub> measured in DMSO-*d*<sub>6</sub>.



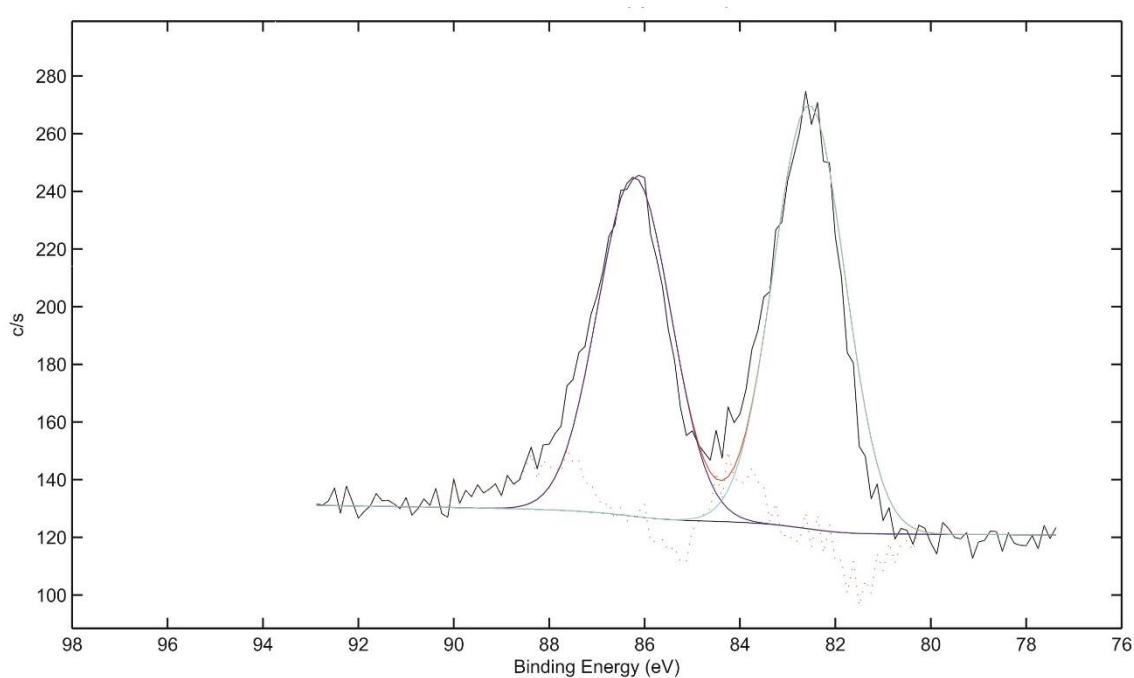
**Figure S6.** Full XPS spectrum of the catalyst Au-SiO<sub>2</sub>-[bmim]PF<sub>6</sub>.



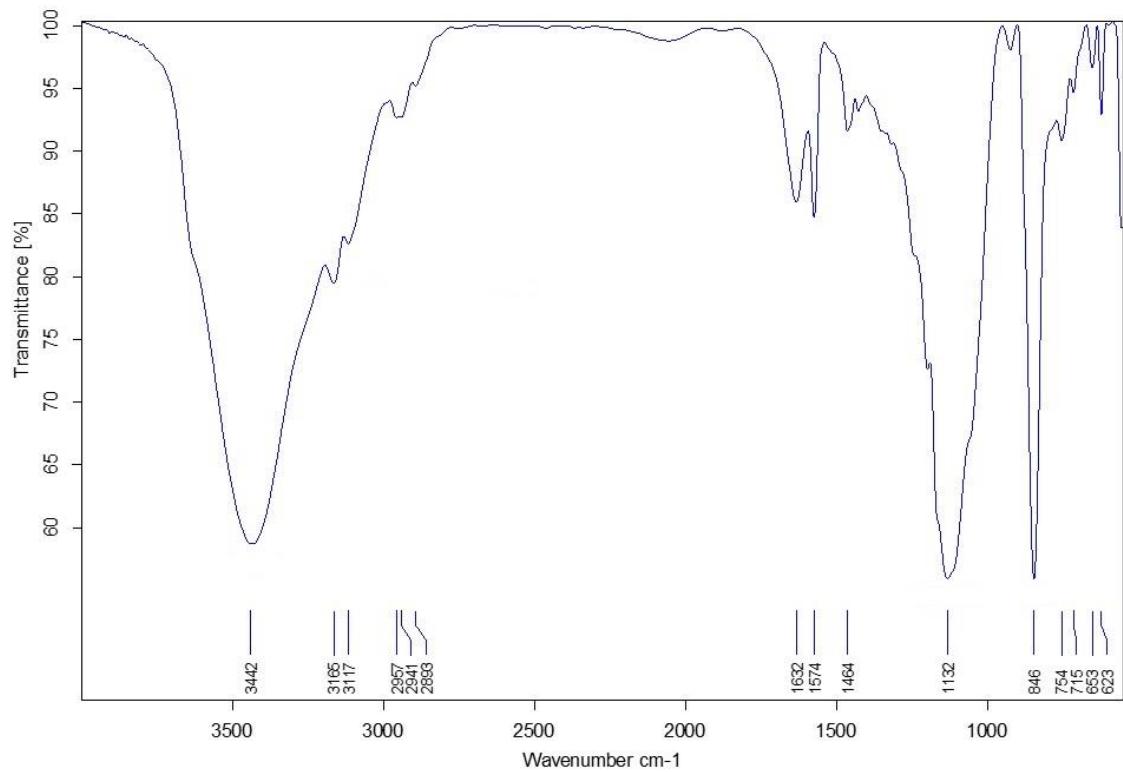
**Figure S7.** Core level region XPS spectra of N 1s of the catalyst Au-SiO<sub>2</sub>-[bmim]PF<sub>6</sub>.



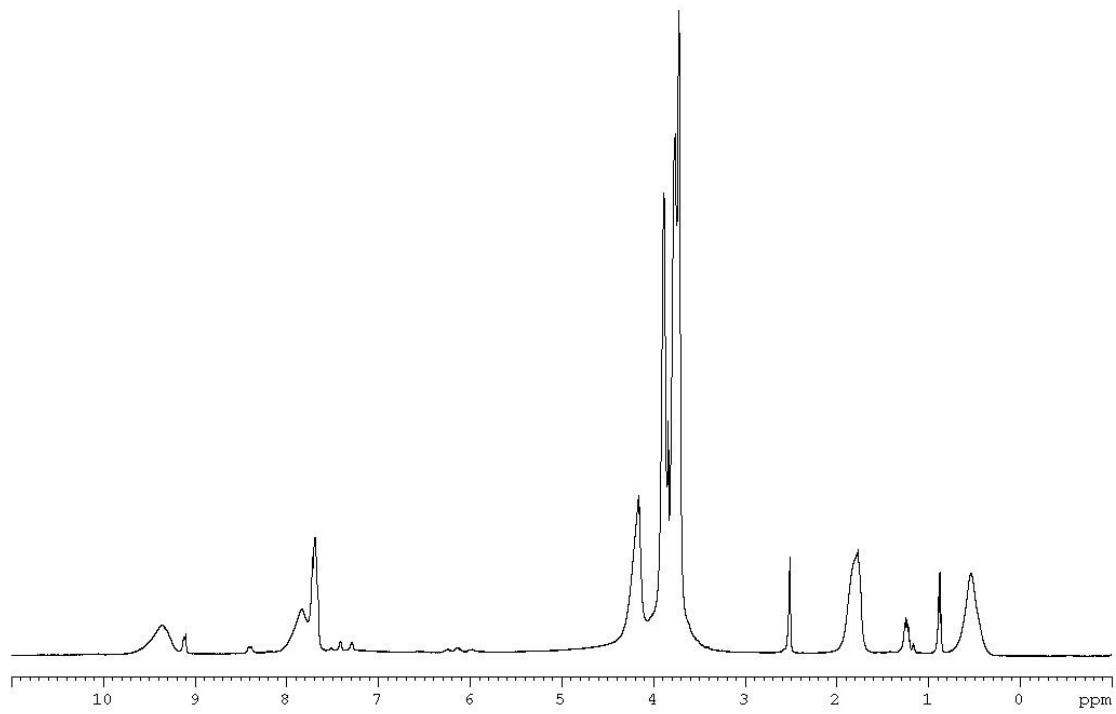
**Figure S8.** Core level region XPS spectra of Si 2p of the catalyst Au-SiO<sub>2</sub>-[bmim]PF<sub>6</sub>.



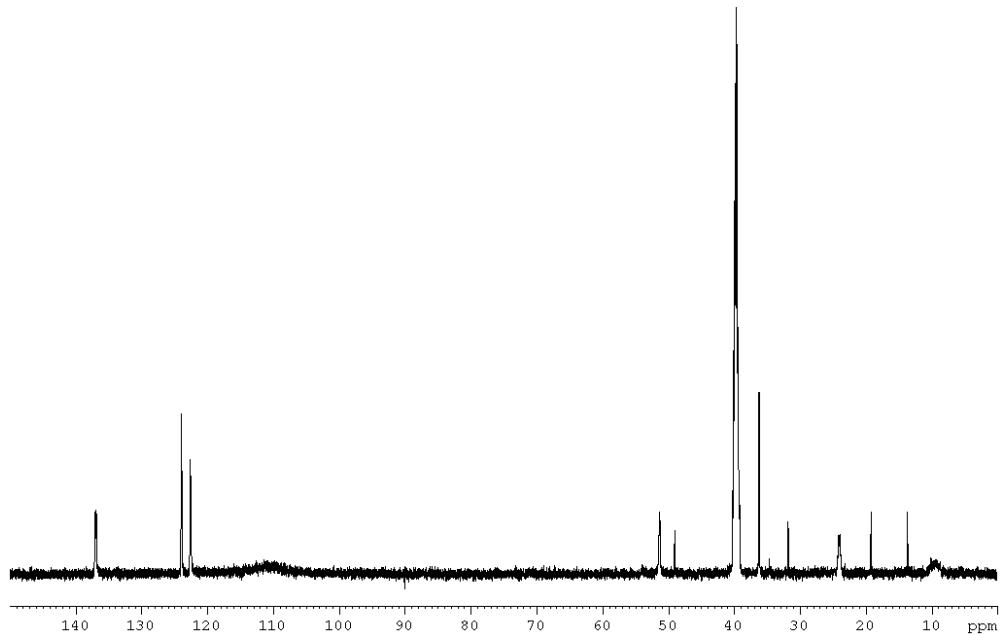
**Figure S9.** Core level region XPS spectra of Au 4f of the catalyst Au-SiO<sub>2</sub>-[bmim]PF<sub>6</sub>.



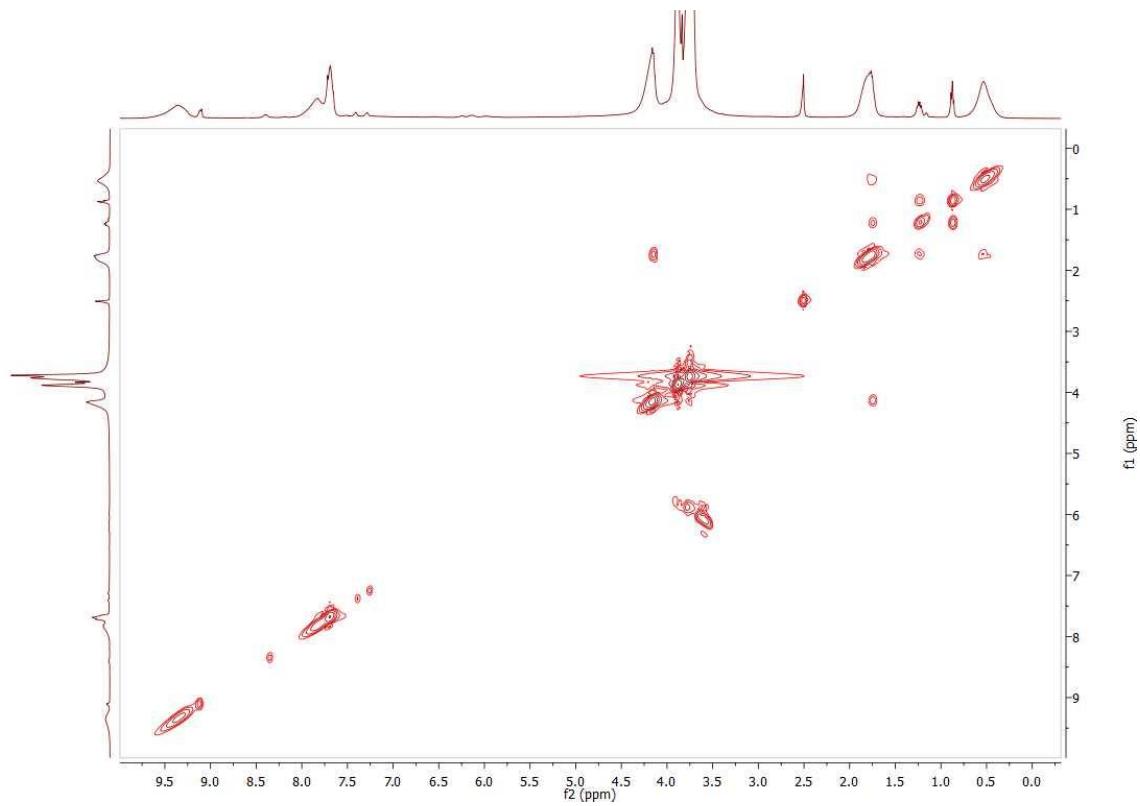
**Figure S10.** FT-IR of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>@IL(PF<sub>6</sub>) measured in KBr.



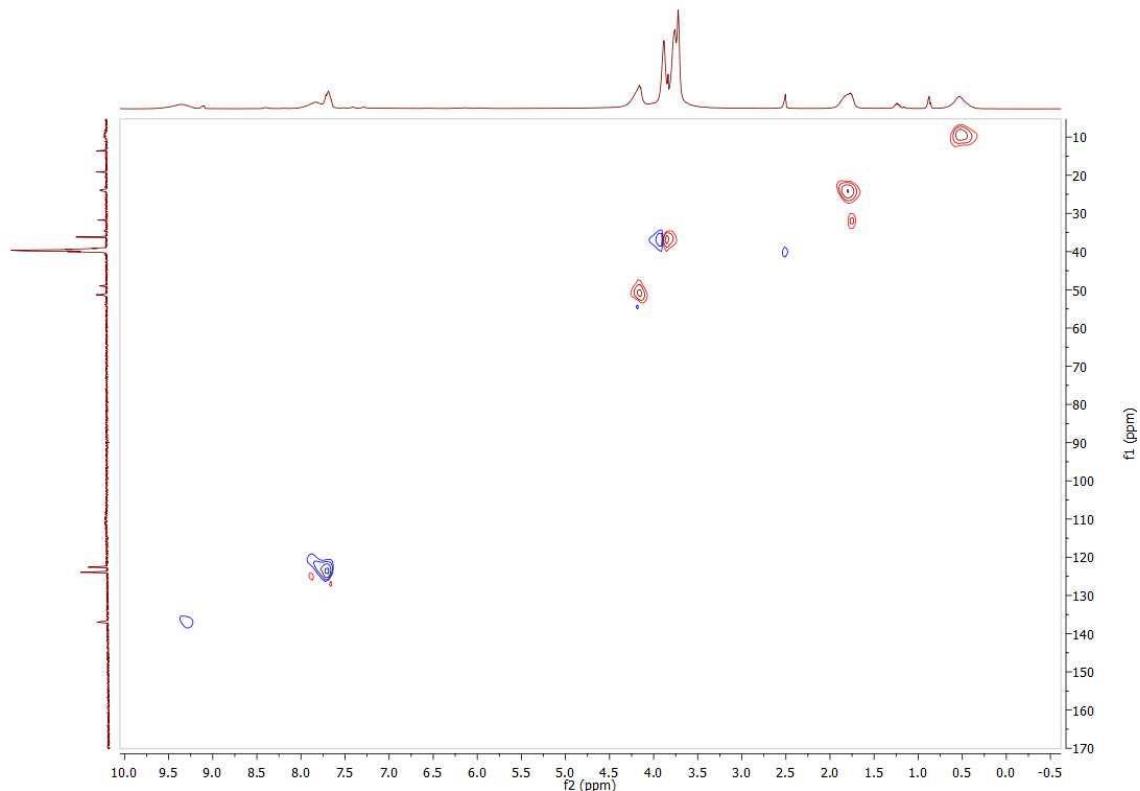
**Figure S11.** <sup>1</sup>H HRMAS NMR spectrum (500.13 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>@IL(PF<sub>6</sub>) measured in DMSO-*d*<sub>6</sub>.



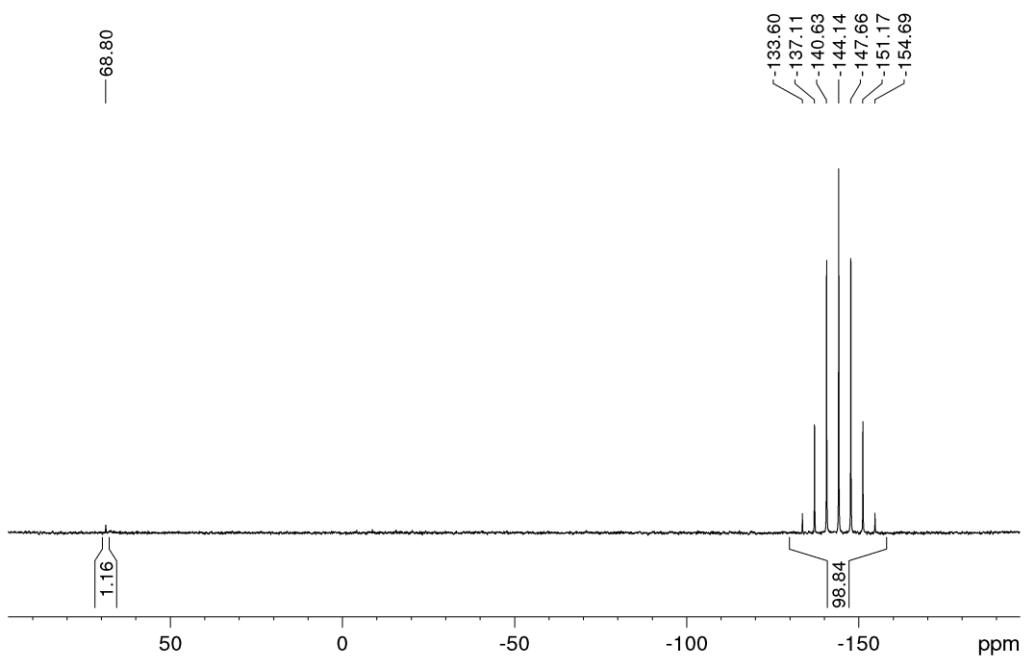
**Figure S12.** <sup>13</sup>C HRMAS NMR spectrum (125.76 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>@IL(PF<sub>6</sub>) measured in DMSO-*d*<sub>6</sub>.



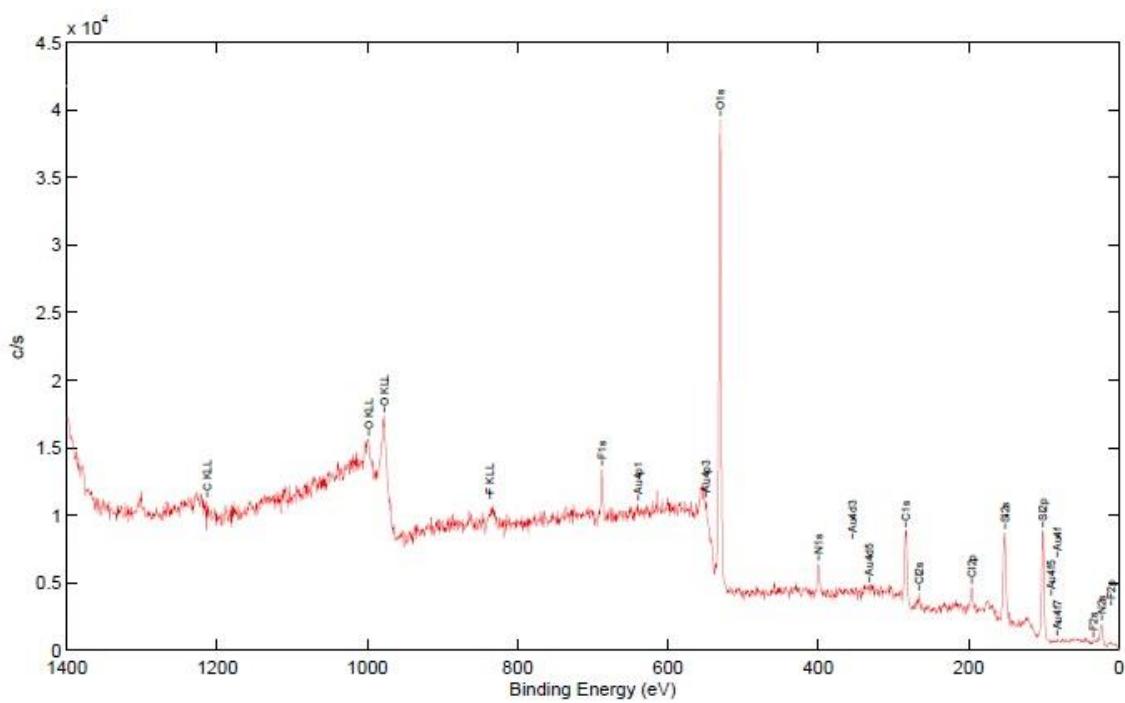
**Figure S13.**  $^1\text{H}$ , $^1\text{H}$  COSY HRMAS NMR spectrum (500.13 MHz) of the precatalyst ( $\text{dppta}\text{AuCl}_2\text{-SiO}_2\text{@IL}(\text{PF}_6)$ ) measured in  $\text{DMSO}-d_6$ .



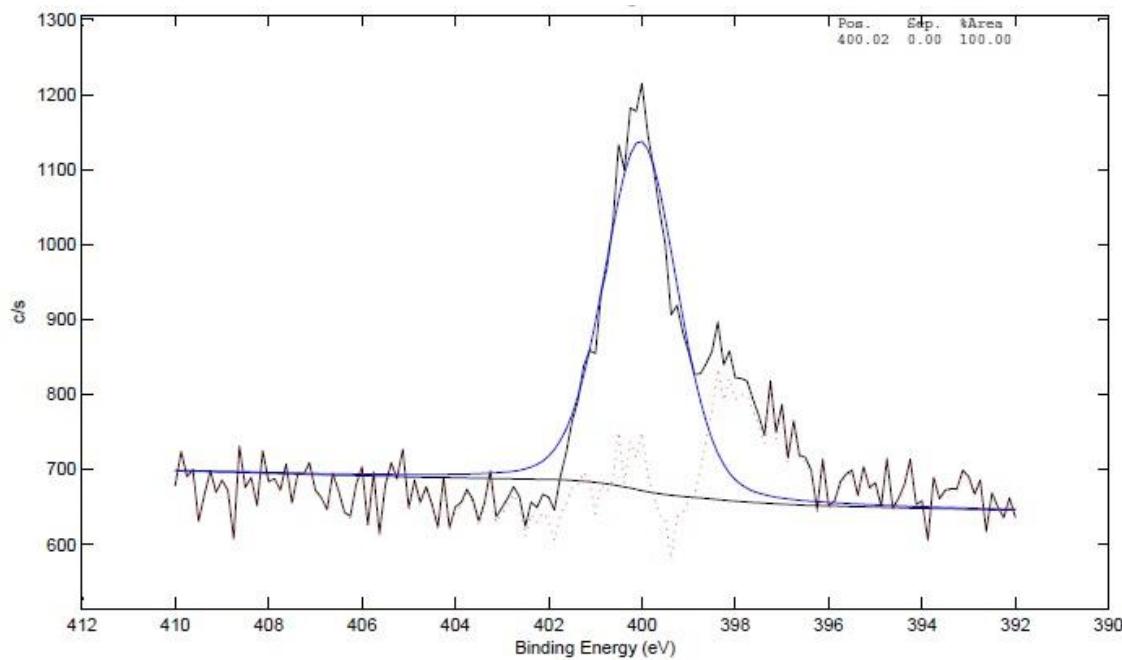
**Figure S14.** Edited  $^1\text{H}$ , $^{13}\text{C}$  HSQC HRMAS NMR spectrum (500.13 MHz) of the precatalyst ( $\text{dppta}\text{AuCl}_2\text{-SiO}_2\text{@IL}(\text{PF}_6)$ ) measured in  $\text{DMSO}-d_6$ .



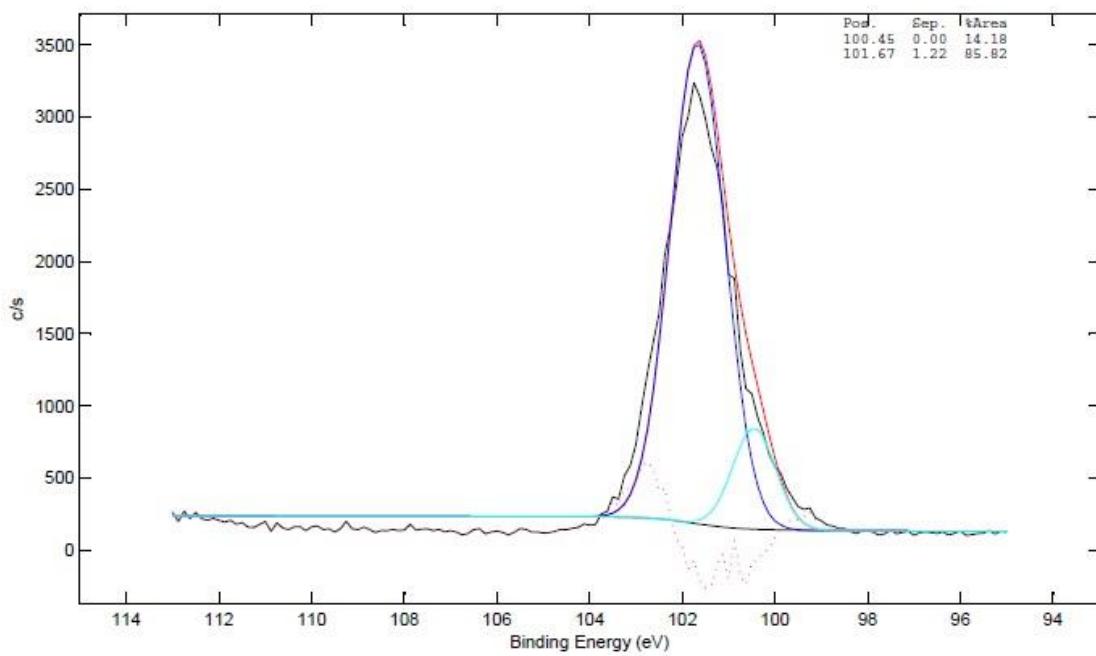
**Figure S15.**  $^{31}\text{P}$  HRMAS NMR spectrum (202.46 MHz) of the precatalyst (dppta)AuCl<sub>2</sub>-SiO<sub>2</sub>@IL(PF<sub>6</sub>) measured in DMSO-*d*<sub>6</sub>.



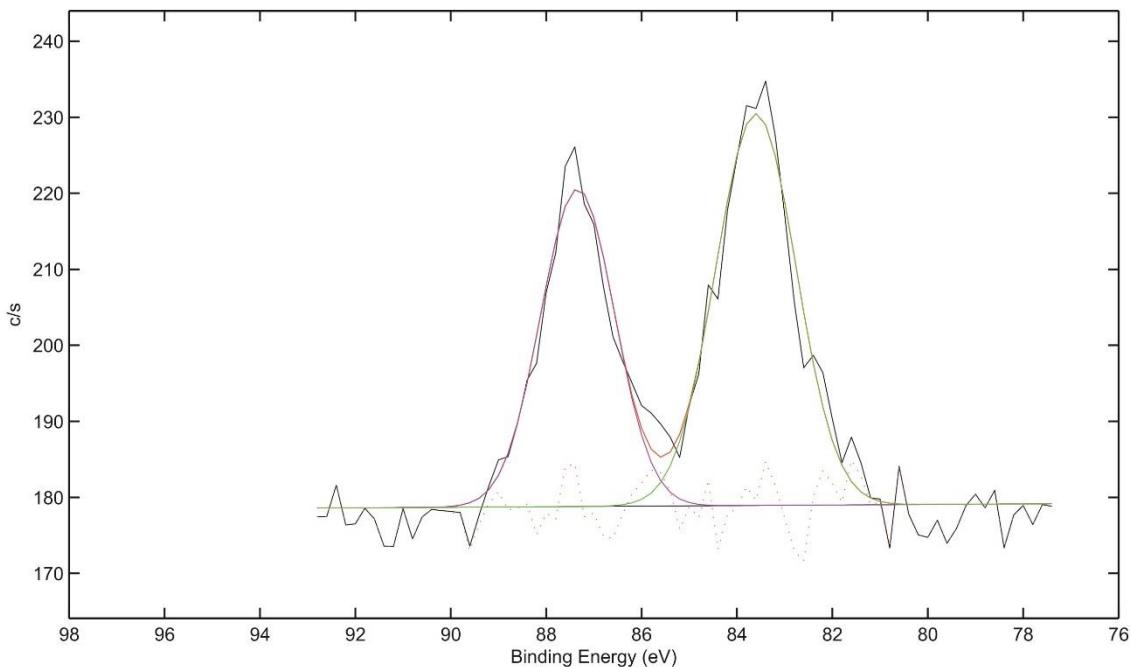
**Figure S16.** Full XPS spectrum of the catalyst Au-SiO<sub>2</sub>@IL(PF<sub>6</sub>).



**Figure S17.** Core level region XPS spectra of N 1s of the catalyst Au-SiO<sub>2</sub>@IL(PF<sub>6</sub>).



**Figure S18.** Core level region XPS spectra of Si 2p of the catalyst Au-SiO<sub>2</sub>@IL(PF<sub>6</sub>).



**Figure S19.** Core level region XPS spectra of Au 4f of the catalyst Au-SiO<sub>2</sub>@IL(PF<sub>6</sub>).