

## Supporting Information

For

**Synthesis and X-ray characterization of  $[\text{RhCl}(\text{C}_2\text{H}_4)(\text{P}i\text{Pr}_3)]_2$ .**

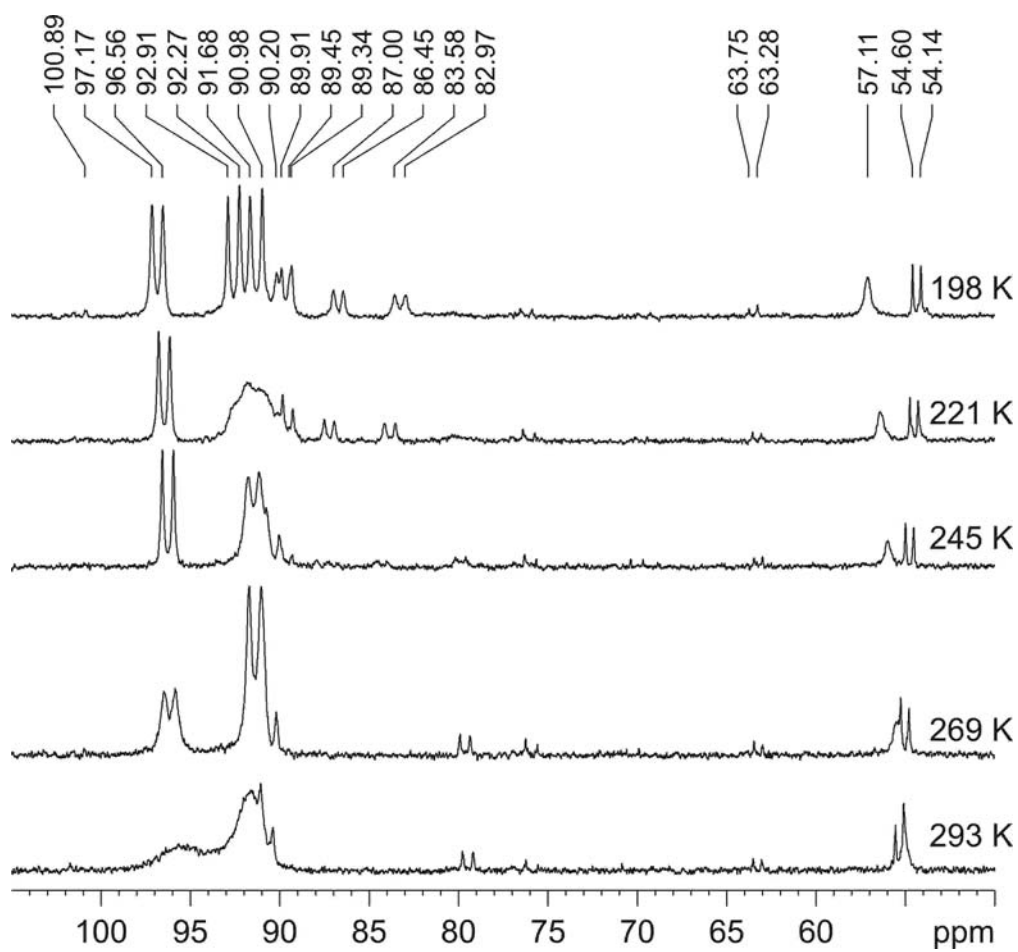
**Multinuclear NMR and DFT investigation of its solid state and solution reaction with dihydrogen. The ethene and propene hydrogenation by the solid Rh-hydrides**

**Antonella Angelini,<sup>[a]</sup> Michele Aresta,<sup>[a]</sup> Angela Dibenedetto,<sup>\*,[a]</sup> Carlo Pastore,<sup>[a]</sup> Eugenio Quaranta,<sup>[a]</sup> Michele R. Chierotti,<sup>[b]</sup> Roberto Gobetto,<sup>[b]</sup> Imre Pàpai,<sup>[c]</sup> Claudia Graiff,<sup>[d]</sup> and Antonio Tiripicchio<sup>[d]</sup>**

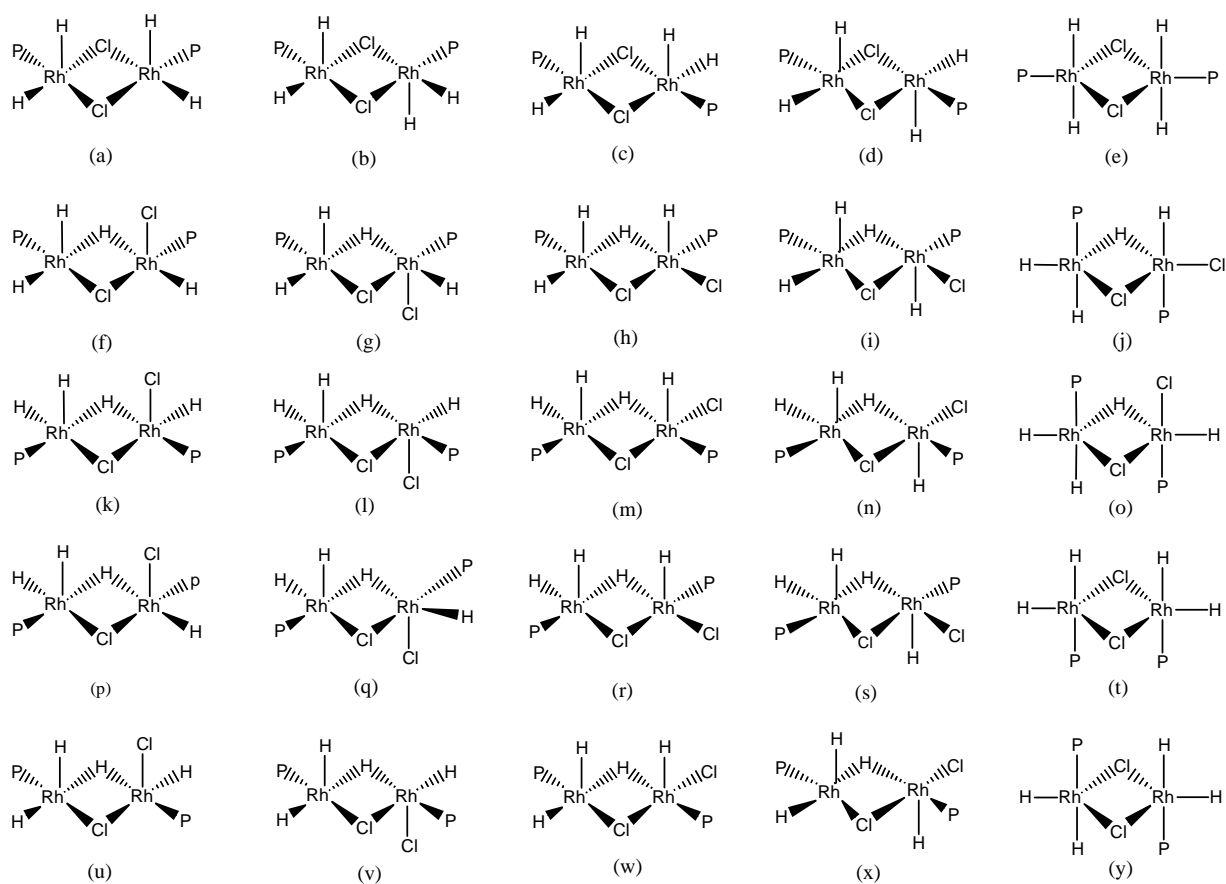
**Figure S1.**  $^{31}\text{P}$  NMR spectra of the compound  $[\text{RhCl}(\text{H})_2(\text{P}i\text{Pr}_3)]_2$  (**2**) recorded in a range of temperature between 293 K and 198 K.

**Figure S2.** 25 isomeric structures that are possible for the complex  $[\text{RhCl}(\text{H})_2(\text{P}i\text{Pr}_3)]_2$

**Figure S3.** 4XC autoclave equipped with a system for the continuous withdrawal of gaseous or liquid samples.



**Figure S1.**  $^{31}\text{P}$  VT NMR spectra of the compound  $[\text{RhCl}(\text{H})_2(\text{P}i\text{Pr}_3)]_2$  (**2**) recorded in a range of temperature between 293 K and 198 K.



**Figure S2.** 25 isomeric structures that are possible for the complex  $[\text{RhCl}(\text{H})_2(\text{PiPr}_3)_2]_2$



**Figure S3.** 4XC autoclave equipped with a system for the continuous withdrawal of gaseous or liquid samples.