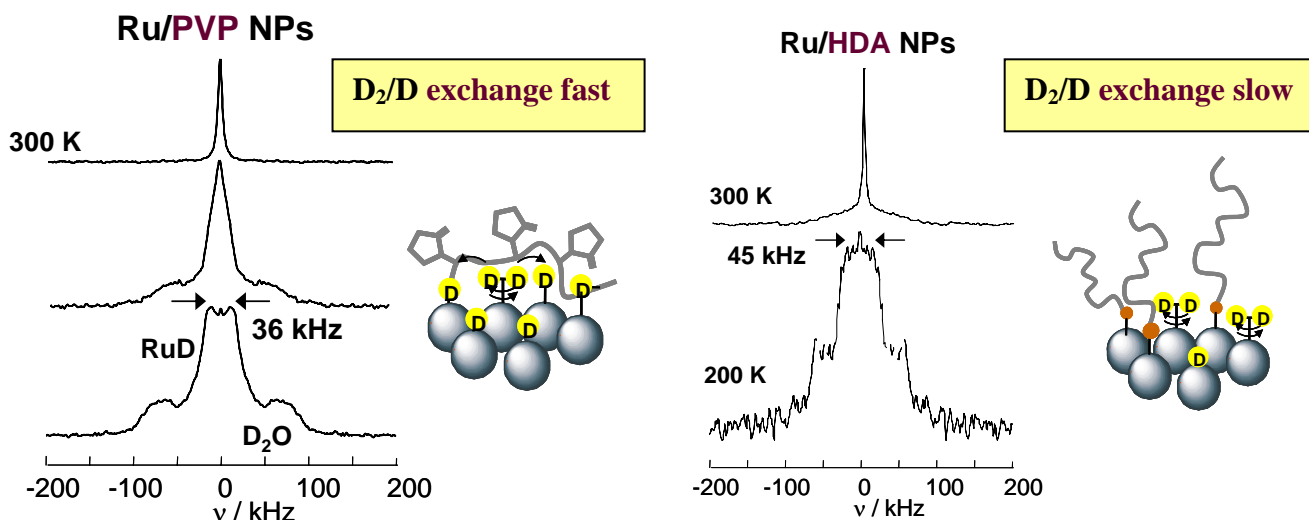
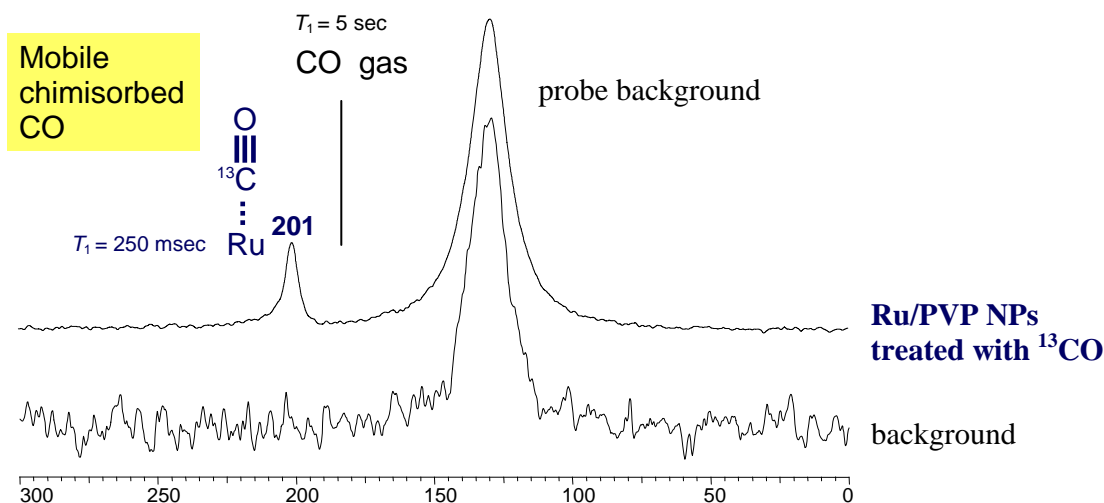


Solid NMR: a useful technique for the characterization of metal NPs surface

Metal nanoparticles synthesized in the group are considered as large **organometallic objects**, and one of our major objectives is to develop the use of molecular chemistry tools, and most particularly **NMR**, to get a precise characterization of the **NPs surface state**. Since Solution NMR experiments are not always available for NPs, solid state NMR experiments are developed to study the particles surface chemistry. As examples it has been possible to show **the coordination of stabilizing ligands or active ligands** (H_2 , CO, olefins...) onto the surface of Ru NPs and in some cases to obtain information about their **reactivity**.



2D NMR CP-MAS spectra of PVP- and hexadecylamine-stabilized Ru NPs: a signal is observed corresponding to the hydrides coordinated at the Ru NPs surface which are in rapid exchange in the case of Ru/PVP NPs but slow exchange for Ru/HDA NPs



^{13}C RMN CP-MAS spectrum of polyvinylpyrrolidone stabilized Ru NPs (static sample) : a signal is observed at 201 ppm corresponding to chemisorbed CO onto the Ru/PVP NPs surface.

Reference

- T. Pery, K. Pelzer, G. Buntkowsky, K. Philippot, H.-H. Limbach, B. Chaudret, *Chem. Phys. Chem.* 2005, 6, 605.