## 4) *Homogeneous Catalysis*

Selected relevant aspects include:

* Isolation of rare **monohapto-allyl Pd(II) complexes**, with enhanced reactivity compared to the ubiquitous $\eta^3$-allyl complexes, and of direct relevance to a number of catalytic transformations involving allyl intermediates (*Organometallics* 2001, *20*, 2966; *J. Chem. Soc., Dalton Trans*. 2003, 507).

* **Conversion of $CO_2$** into higher added value lactones by telomerization with butadiene, using a Pd(II) catalyst which was the first metal complex to allow reversible $CO_2$ fixation under ambient conditions through C-C bond formation (*J. Am. Chem. Soc.* 1981, *103*, 5115; *J. Am. Chem. Soc.* 1988, *110*, 3207). See *Chem. Rev*. 1988, *88*, 747.

* **Alkane activation** with phosphinoenolate Rh(I) complexes which are soluble in neat alkanes (*Organometallics* 1996, *15*, 5551).

* Synthesis of very active Ru complexes for **hydrogenation transfer** of ketones using functional phosphinooxazoline ligands (*J. Chem. Soc., Dalton Trans.* 1999, 589).

* Synthesis of homogeneous Fe-Pd and Fe-Ni bimetallic catalysts which were the most active catalysts known for the **dehydrogenative coupling of stannanes** (see *Chem. Rev*. 2000, *100*, 3541).

* Pd-promoted coupling of **ethylene, CO and functional monomers** (*Angew. Chem. Int. Ed*. 2000, *39*, 2867).

* **Double C-Cl activation of $CH_2Cl_2$** leading to transfer of the $CH_2$ group to phosphorus (*Chem. Commun*. 2009, 890; *Organometallics*, 2015, *34*, 2255).

* **Ethylene oligomerization**: a long-standing collaboration with the Institut Français du Pétrole (IFP Energies nouvelles), has focused on selective catalysts for the oligomerization of ethylene (*Acc. Chem. Res*. 2005, *38*, 784; *Chem. Commun*. 2014, *50*, 1398-1407 (Feature article)).