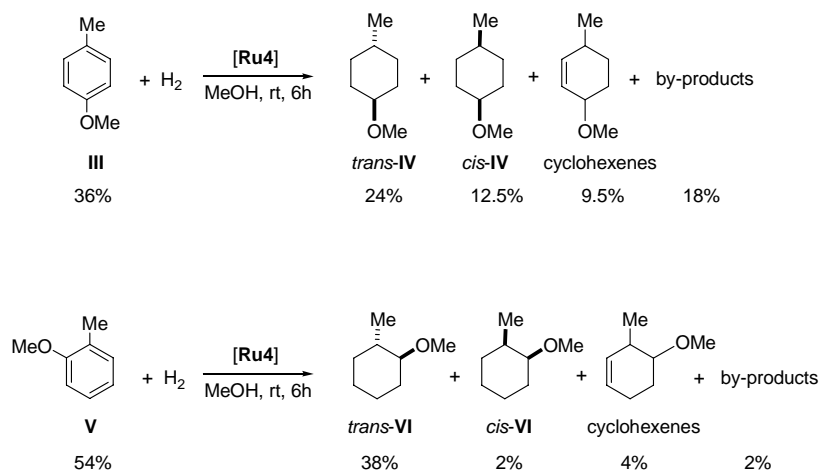
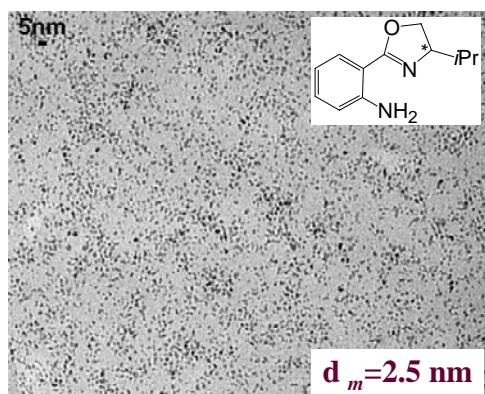


Colloidal and supported catalysis

The nanoparticles synthesized in the group can be used as **colloidal catalysts** using fresh colloidal solutions or solvent redispersed NPs, or as **heterogeneous catalysts** when they are deposited onto a support (silicia, alumina, alumina membrane,...).

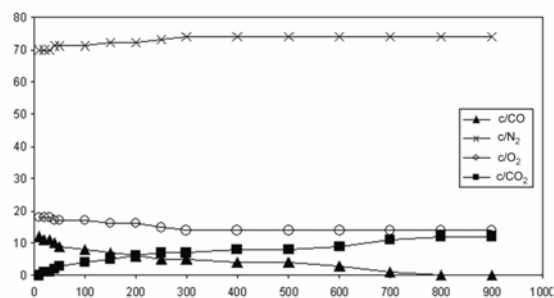
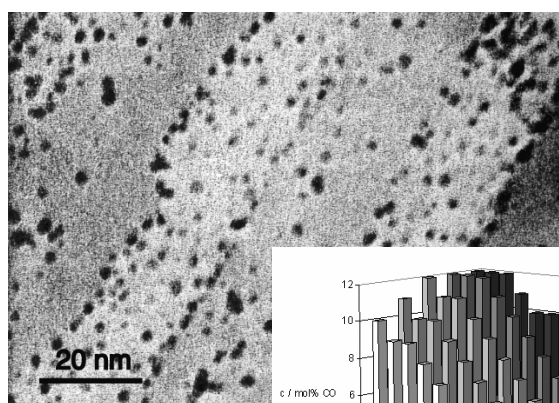
Example of colloidal catalysis

- Chiral oxazoline stabilized Ru nanoparticles** dispersed in methanol gave rise to interesting results in the hydrogenation of *ortho*- and *para*-methylanisole: despite a modest catalytic conversion, **trans** hydrogenation products are formed while a molecular equivalent catalytic system is not active; these results are in favour of a **real colloidal catalytic activity**.



Example of supported catalysis

- Ru nanoparticles deposited inside alumina membranes** are active in **carbonyl monoxide oxidation** in gas phase (collaboration Pr G. Schmid, Germany): CO oxidation has been realized with various sizes Ru NPs dispersed inside the channels of alumina membranes; a **decreasing activity** has been observed when the **NPS sizes increase**.



References

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- "Gas phase catalysis by metal nanoparticles in nanoporous alumina membranes", H.-P. Kormann, G. Schmid, K. Pelzer, K. Philippot, B. Chaudret, *Z. Anorg. Allg. Chemie*, 2004, 630, 1913.