Copper(I) and Ruthenium(II) complexes of Bioinspired Ligands of soft and Hard Donors: Xanthates and Dithioformates from Metal-Borohydride

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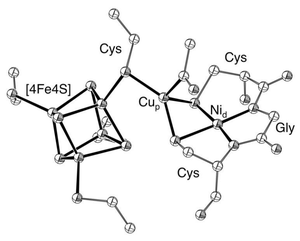
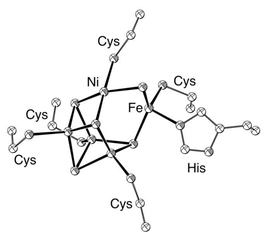
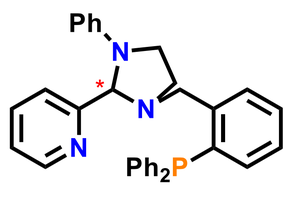
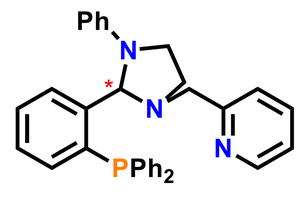
Introduction





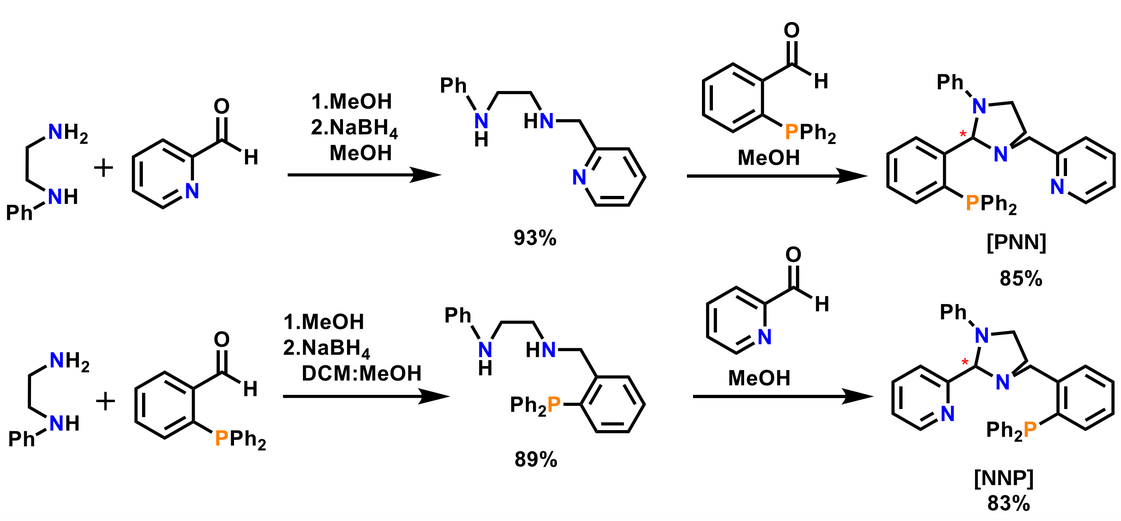
Acetyl-coenzyme A synthase (ACS)
Carbon monoxide dehydrogenase (CODH)



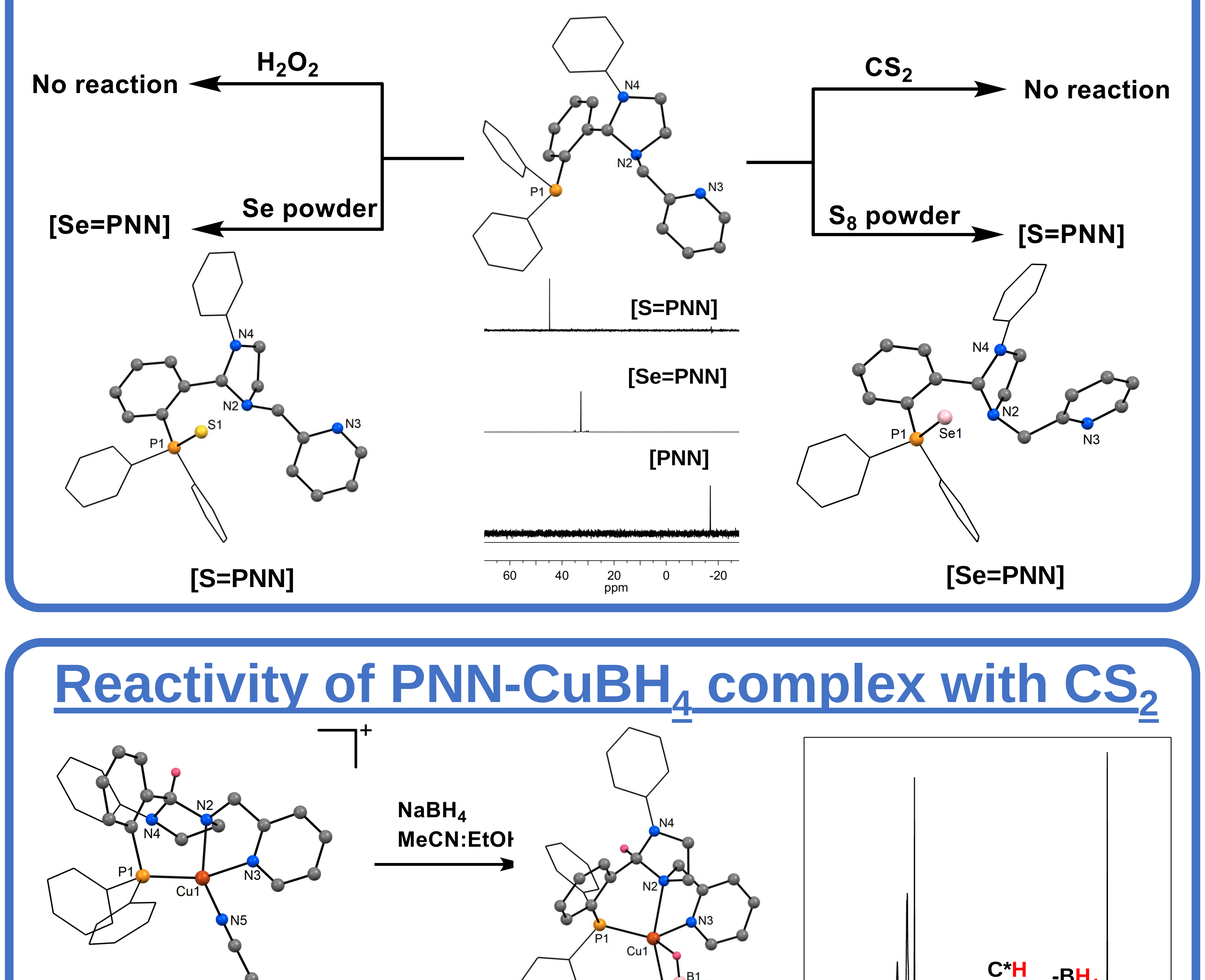


- Modified koneramines as bioinspired ligands with hard and soft donors together (PNN or NNP)
- Flexible coordination modes upon varying the oxidation states
- Expeditious synthesis of ligands and complexes
- Chiral ligands and complexes

Ligands Synthesis

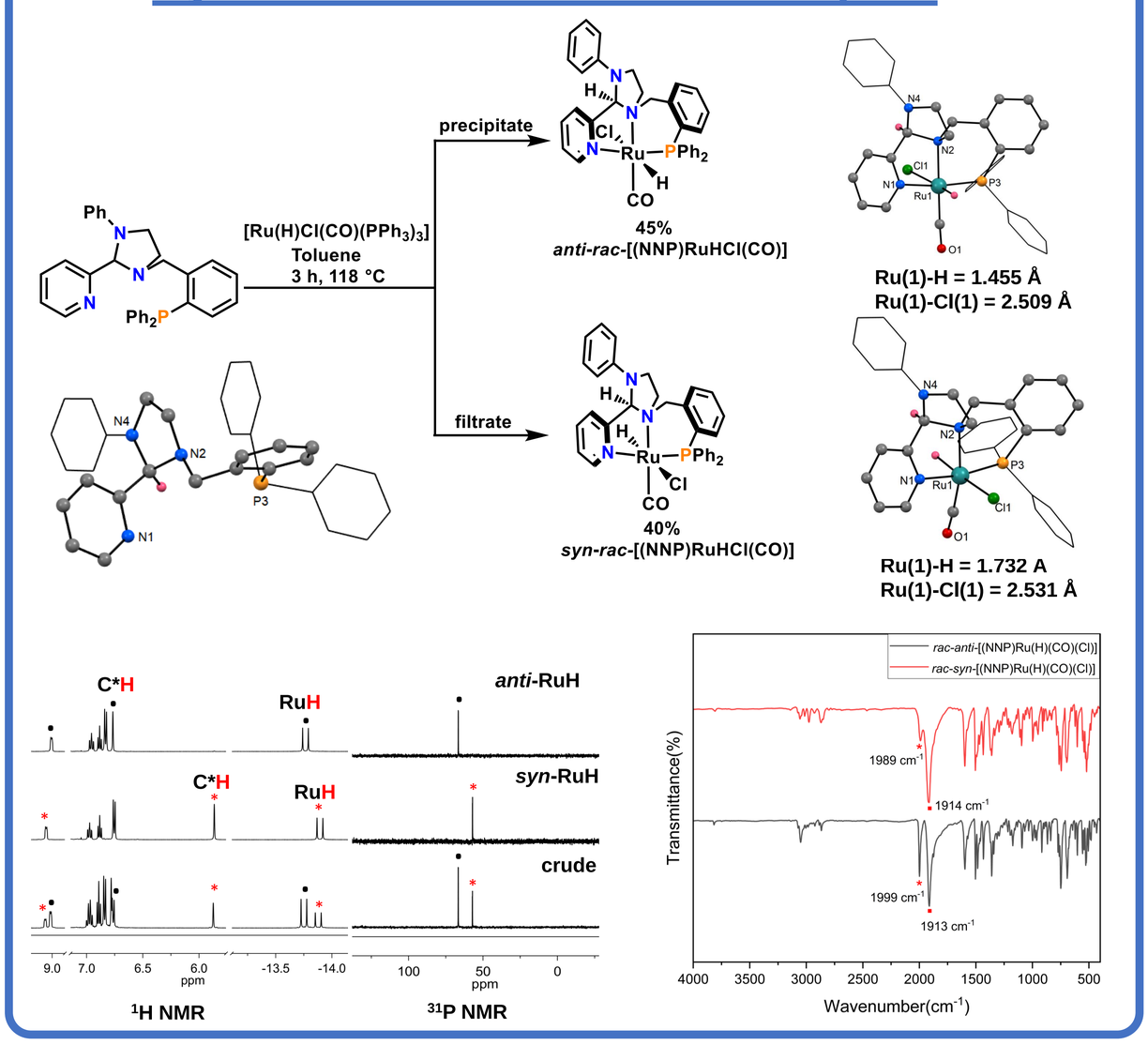


Reactivity of PNN

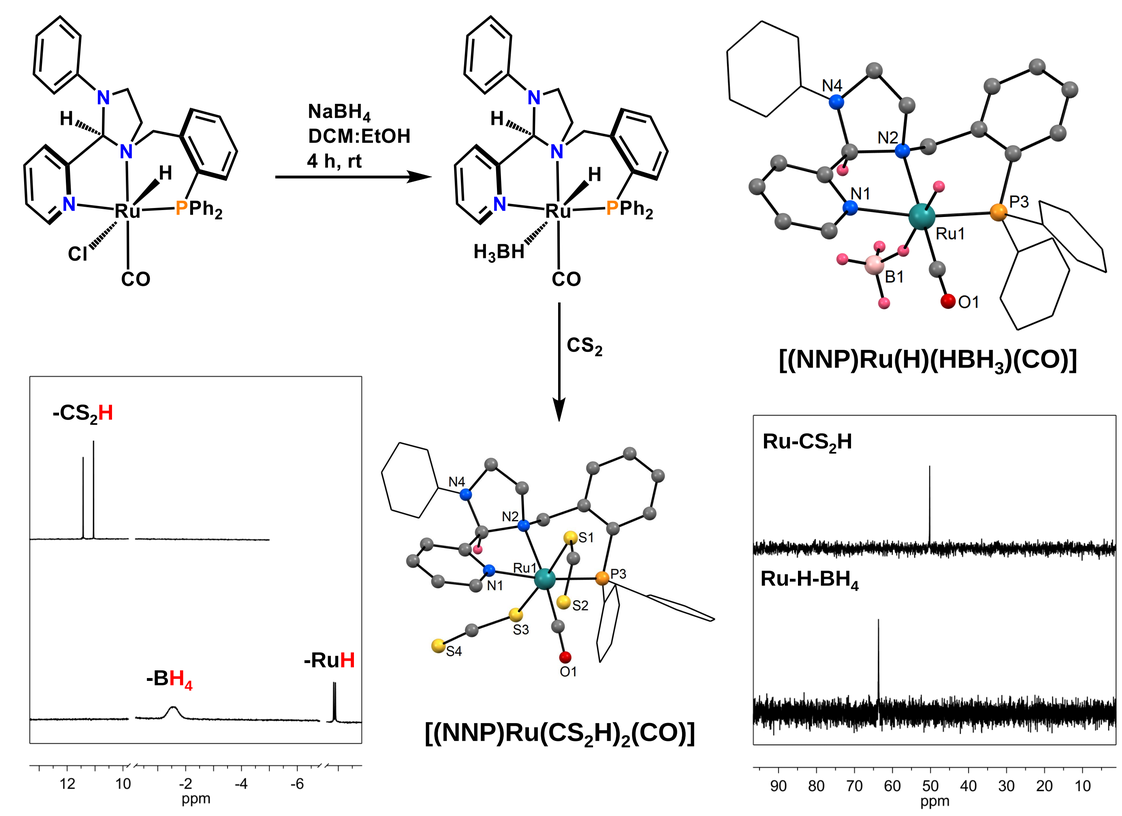


Reactivity of PNN-CuBH$_4$ complex with CS$_2$

Syntheses of NNP-RuH Complex



Reactivity of NNPRu(H)BH$_4$ complex with CS$_2$



Summary

- Modified koneramine ligands (NNP and PNN) and their metal hydride complexes have been synthesized and characterized by ^{1}H, ^{13}C, ESI-MS and SC-XRD techniques; facile synthesis of a tridentate chelate with hard and soft basic donor sites
- Activation of CS_2 by [(PNN)Cu(μ-BH_4)] yielding copper(I) xanthates [(PNN)Cu(CS_2OR)] complexes.
- Double insertion of CS_2 into Ru-H bonds of Ru-hydride-borohydride complex yielding bis-dithioformate [(NNP)Ru(CO)(CS_2H)$_2$] complex.