

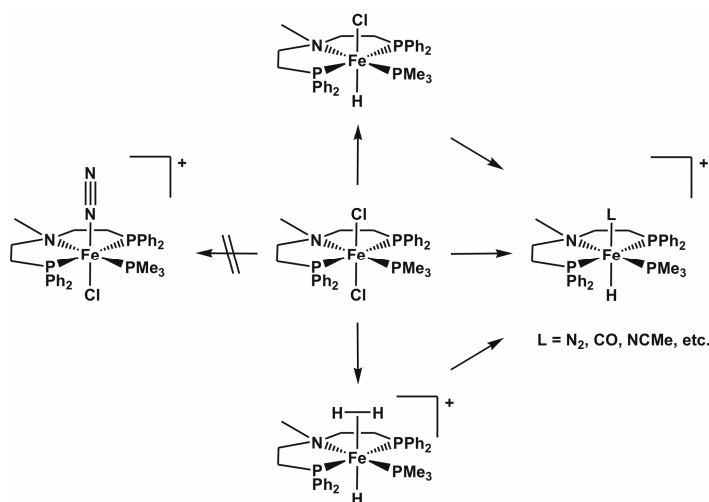
Synthesis and Characterization of various Hydrido Complexes of Iron(II) containing the NP₂-ligand

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Nitrogen fixation is one of the essential processes of nature. As part of the active site of the nitrogenase (FeMoco), iron plays an important role in the synthesis of ammonia from dinitrogen. The particular iron atom of the FeMoco at which N₂ coordinates and which reaction pathway to NH₃ is most favourable was investigated by theoretical studies by Dance.^[1]

Because N₂ coordinated to mononuclear iron(II) can not be protonated to generate an iron diazenido species as a first intermediate on the way to generate NH₃, these iron(II) dinitrogen complexes are ideal systems to investigate the initial step along the reaction pathway, the process of N₂ binding.^[2]



A series of Fe(II) complexes containing the NP₂-ligand (where NP₂ is Bis(2-(diphenylphosphino)ethyl)methylamine) have been prepared and isolated. The figure shows the general concept of the target compounds. We use *trans* hydrido coligands because they are very strong σ -donors, which results in a stronger Fe-N binding.

We will present the synthesis of the ligand, the complexation reaction with iron(II) chloride, subsequent reactions to various hydrido complexes, and the characterization of the complexes by spectroscopic methods (IR, UV, Mössbauer) and X-ray crystallography.^[3]

Literature:

- [1] I. Dance, *Dalton Trans.* **2008**, 5977. [2] F. Tuzcek *et al.*, *Inorg. Chem.* **2002**, *41*, 3491.
[3] a) T. A. George, M. A. Jackson, *Inorg. Chem.* **1988**, *27*, 924. b) G. J. Leigh *et al.*, *J. Chem. Soc. Dalton Trans.* **1993**, 3041.