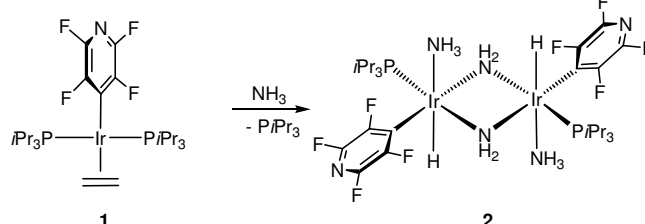


# Reactivity of Ammonia and Methylamine at Iridium Complexes: Coordination versus N-H-Bond Cleavage

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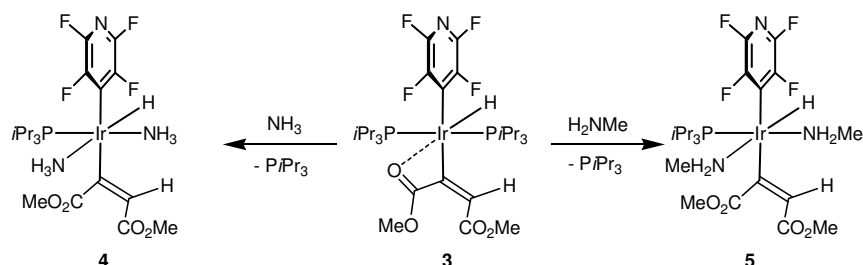
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One major challenge in the development of new catalytic processes is the functionalisation of amines, especially ammonia.<sup>[1]</sup> The reaction of complex **1**<sup>[2]</sup> with ammonia via oxidative addition of ammonia leads to a binuclear amido complex **2**<sup>[3]</sup> (Scheme 1), which is insoluble in any common organic solvent.



**Scheme 1:** Formation of a dimeric amido complex.<sup>[2]</sup>

To overcome the problem of solubility of the amido compound **2**, we decided to modify the ligand environment of complex **1**. Therefore, we synthesised the hydrido vinyl species **3**.<sup>[3]</sup> The reaction of compound **3** with ammonia or methylamine afforded the monophosphine complexes **4**<sup>[3]</sup> and **5** (Scheme 2).



**Scheme 2:** Reaction of ammonia and methylamine with the hydrido-vinyl complex.<sup>[3]</sup>

In the case of the ammonia complex **4** no reductive elimination reaction of a C-H bond takes place. However, on stirring a solution of complex **5** the N-C coupling product 1-methyl-3(methylamino)-pyrrole-2,5-dione can be isolated. The hydrido vinyl complex **3** is an active catalyst in the transfer hydrogenation of hexane and the trimerisation of dimethylacetylenedicarboxylate.

## Literature

[1] J. Haggin, *Chem. Eng. News*, **1973**, 71,23. [2] M. Ahijado Salomon, T. Braun, I. Krossing, *Dalton Trans.* **2008**, 5197. [3] M. Ahijado Salomon, A.-K. Jungton, T. Braun, *Dalton Trans.* **2009**, 7669.