

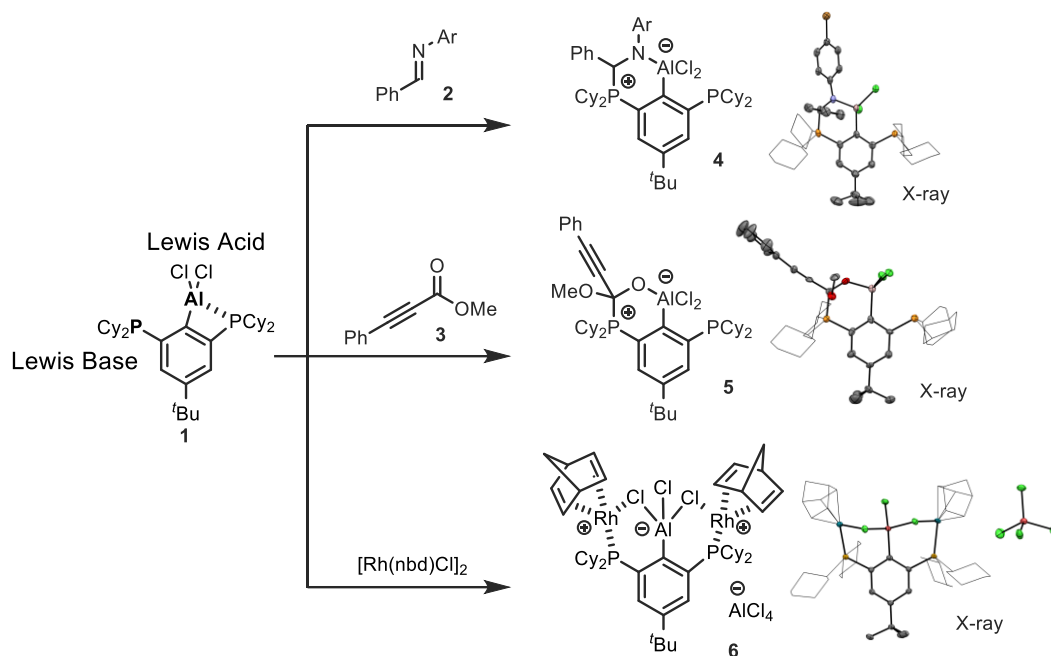
Development of Al Complexes with Phosphino Group-Substituted Carbon Ligand for Lewis Acid/Lewis Base Catalyst

(Graduate School of Engineering, Osaka University) Yoshihiro Nishimoto, ○ Hirotaka Okamoto, Makoto Yasuda

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Utilization of aluminum complexes as a Lewis acid catalyst is significant in organic synthesis due to the abundance and low toxicity of aluminum. The properties of organoaluminum complexes can be electronically and sterically controlled by modifying their hydrocarbyl ligands.¹ In this study, we synthesized organoaluminum complex **1** with two phosphino groups at the *ortho* positions of the aryl substituent.

In contrast to previously reported Al/P complexes,² the reaction of complex **1** with relatively-less reactive imine **2** or ester **3** gave addition product **4** or **5**. In these reactions, the aluminum center and the free phosphino group act as a Lewis acid and a Lewis base, respectively, in which Al–N, or Al–O and P–C bonds were formed. Moreover, the application of complex **1** as a ligand to a transition metal was investigated. The phosphino and chloro groups in complex **1** act as coordinating moieties to give a Al/Rh polynuclear complex **6** in the reaction of [Rh(nbd)Cl]₂. The application of complex **6** as a catalyst are ongoing.



1) H. Yamamoto, *et al.*, *J. Am. Chem. Soc.* **1985**, 107, 4573. 2) a) W. Uhl, *et al.*, *Chem. Eur. J.* **2018**, 24, 12856. b) Y. Mizuhara, N. Tokitoh, *et al.*, *ChemPlusChem* **2020**, 85, 933.