

Seminar

Carbene-Group 15 Element Adducts: Syntheses to Applications

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Pnictinidenes (:P–R) are highly reactive low-valent E(I) compounds and are considered as analogs of carbenes (:CR₂) and nitrenes (:N–R). These systems are stable only at very low temperatures and in the gas phase. Therefore, isolation of such species (for instance phosphinidenes, :P–R) was achieved not only by employing metal atoms but also Arduengo type nucleophilic N-heterocyclic carbenes (NHCs). This report demonstrated that NHCs could be excellent soft ligands whose applications can be extended in the trapping of such novel class of low-valent group-15 adducts. Very recently, we have developed a novel method for the isolation of an NHC supported new phosphinidene [(IPr)→PSiMe₃ and (IPr)→P–H] and it was introduced as a synthon for the preparation of terminal carbene–phosphinidenide transition metal complexes of the type [(IPr=P)ML_n] (ML_n= (η⁶-p-cymene)RuCl and (η⁵-C₅Me₅)RhCl) (scheme). Their spectroscopic and structural characteristics showed their similarities with their aryl-phosphinidene counterparts. The monoanionic “(IPr)P” moiety forms highly covalent metal-phosphorus double bonds and is also capable of bridging two or three metal atoms as demonstrated by the preparation of bi- and trimetallic complexes. In this presentation, isolation of different reactive NHC-group 15 adducts and their use in the stabilization of reactive main-group and transition metal organometallic fragments will be discussed in detail.

Thursday, Sep 21st 2017

04:00 PM (Tea/Coffee at 03:45 PM)

Auditorium, TIFR-H (FReT-B)