Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Internal Seminar

Synthesis and Chemistry of Group 6 and 9 Borylenes, Metallaboranes and Metallaheteroboranes

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Over the past decade, transition metal complexes of boron have become established as the fourth class of compounds involving direct metal–boron interactions. In contrast to the other two major groups in this field, i.e. borides and metallaboranes, transition metal complexes of boron are characterized by electron-precise two-centre two-electron bonds between boron and the metal centre. According to this pattern of metal–boron interaction, a variety of different co-ordination modes for boron-containing ligands have been realised, allowing for a systematic classification of those compounds into borane, boryl, and borylene complexes. Borylene complexes, representing the most extensive subclass, have remained a focus of intense research, particularly for their implication in the functionalization of unsaturated organic substrates. Trinuclear triply bridging borylene complexes of group 6 and 9 transition metals [(μ_3-BH)(C_p*Rh)$_2$(μ-CO)M(CO)$_5$], (M = Mo, W) have been synthesized from the reaction of nido-[(C_p*Rh)$_2$$B_3H_7$] and [M(CO)$_5$.thf] (M = Mo and W). The chemistry of trimetallic triply bridging borylene complexes was explored with Lewis bases such as t-butyl isocyanide and bisphosphine. Nido-[(C_p*Rh)$_2$$B_3H_7$] has also been found to be a good precursor for the synthesis of metallaboranes and a novel class of μ_9 boride cluster. Subsequently, DFT studies have been carried out to get an insight into the bonding interactions present in these molecules.

Monday, Feb 11th 2019

2:30 PM (Tea/Coffee at 2:00 PM)

Seminar Hall, TIFR-H