

Internal Seminar

Cross- Dehydrocoupling of Si-H/N-H Bonds and Hydroelementation Reactions Mediated by Alkali, Alkaline-Earth and Early Transition Metal Complexes

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Finding the molecules, which are able to catalyze the reaction between others, is an important contribution of molecular chemists to increase the efficiency of chemical reactions. The atom economical reactions or approaches have provided significant challenge to the communities of organometallic chemists and synthetic organic chemists. The term atom economy is conversion efficiency of a reaction process in terms of all atoms involved. In an ideal chemical process the amount of starting materials are equal to the amount of products generated and no atom is wasted. Recent developments like high raw material cost and increased sensitivity to environmental concerns have made atom economical approaches more popular.

In my talk, I will present the N-H/H-Si cross-dehydrogenative coupling (CDC) of hydrosilanes and amines, with high conversion (>90%) and chemo-selective production of silazanes, using easily available, non-toxic and economically viable group 1 metal hexamethyldisilazides $[MN(\text{SiMe}_3)_2]$ (M=Li, Na, K) as pre-catalysts under mild conditions. In addition, I will also discuss the syntheses and structural characterization of well-defined homo- and heteroleptic alkaline-earth and early transition (group IV) metal complexes supported by novel phosphinilido-imine chalcogenides, boranes and 1,4-diaza1,3-butadiene (DAD) ligands in their coordination sphere as multi-dentate chelating ligands. These all newly prepared heteroleptic metal complexes were employed as active pre-catalysts for the atom economical hydroelementation (hydroamination, hydrophosphination and hydrosilylation) reactions. Finally, I will give the brief summary of my post-doctoral work at Osaka University, Japan.

Thursday, Apr 26th 2018

4:00 PM (Tea/Coffee at 3:30 PM)

Seminar Hall, TIFR-H