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Title:	Bicyclic (Alkyl) (amino) Carbene (bicaac) supported iridium complex, [(bicaac) Ir (cod) ci] for hydrosilylation reactions
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Abstract:	<p>The application of transition metals in catalysis is one of the enthusiastic areas in the field of chemistry, and one of the subsets concerning this area is governed by the chemistry of transition metal complexes supported by carbenes as ligands. The research interests in the carbene field have witnessed major resurgences with the advent of new designs of the carbenes (heteroatoms flanking carbene carbon, acyclic, cyclic structures etc.) and facile synthetic methods to attain these successfully. The major attention this area drew was with the rise of N-heterocyclic carbenes (NHCs). There are wide literature reports available on NHCs comprising metal complexes which serve as a precedent for the catalytic process involved. With time there has been further advancements in the field of carbenes with the advent of cyclic (alkyl)(amino) carbenes (CAACs) and then further leading to bicyclic(alkyl)(amino) carbenes (BICAACs) which has shown much better performance than NHCs and CAACs with respect to its amphiphilic nature. In homogeneous catalysis, particularly, Ir, Ru, Pd, Rh-NHC complexes have shown superior catalytic activity towards important organic transformations such as C-C bond formation, transfer hydrogenation, direct hydrogenation, hydrosilylation, hydroboration etc. Encouraged by literature results of classical NHC-metal complexes, herein we synthesized iridium complex with new carbene (BICAAC), that is [(BICAAC)Ir(COD)Cl] and evaluated its catalytic activity towards hydrosilylation of carbonyl and imines using Et 3 SiH. After optimizing the best suitable catalytic protocol (mild), the substrate scope was examined. The insights to the mechanism operating with respect to the aldehyde functionality was tested with the formation of Ir-H which was confirmed by performing stoichiometric reaction of the catalyst and HSiEt 3 . Additionally, the synthesis of the cationic analogue [(BICAAC)Ir(COD)] + [SbF 6] - of the parent covalent complex [(BICAAC)Ir(Cl)COD] was also successfully achieved and characterized by NMR, HRMS and single crystal X-ray techniques.</p>
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