

Abstract

The thesis presents about the recently discovered family of carbene called Cyclic Alkyl(Amino) Carbene. The chapter 1 of this thesis starts with a brief introduction about the two unshared valence electron containing divalent species known as carbenes with their stability and electronic structures. The most commonly used carbenes in chemistry are diaminocarbenes also, known as classical NHCs. A concise information about their electronic properties, transition metal complexes, catalytic activities have been mentioned. Other family of carbenes like cyclic (alkyl)(amino) carbenes (CAACs), bis(amino)cyclopropenylidenes (BACs), acyclic di(amino)carbenes (ADACs), acyclic (alkyl)(amino)carbene (AAACs) have been delineated with due comparison of classical NHCs and CAACs. The CAACs are more nucleophilic as well as more electrophilic than diaminocarbenes due to their unique steric and electronic properties. The CAACs electronic properties and structures, their uses to stabilize unusual diamagnetic/paramagnetic main group metals and transition metal species, activation of small molecules, catalytic activities have been specified in this chapter. During the course of the thesis, the mercury complexes of CAAC have been synthesized. The synthetic and characterization of these CAAC-mercury(II) complexes are mentioned here.