

EXPANDED RING N-HETEROCYCLIC CARBENES – VERSATILE LIGANDS FOR TRANSITION METAL MEDIATED CATALYSIS AND LIGHT EMITTING MATERIALS

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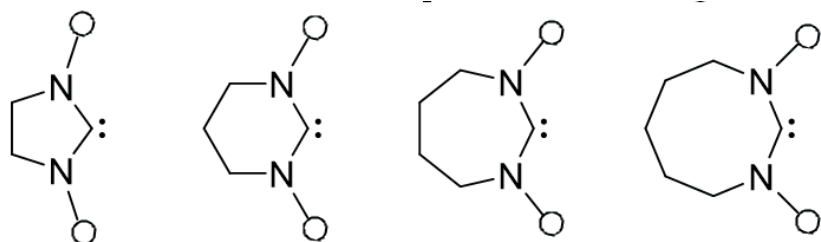
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N-heterocyclic carbenes (NHCs) are highly tunable ligands for construction of transition metal complexes. The core of NHC can consist of five-, six-, seven-, and even eight-membered ring heterocycle. By varying the size of the cycle, donor and steric properties can be tuned in a wide range. Expansion of the ring leads to significant increase in electron donating properties, as well as increase in steric hindrance of the carbene. Additionally, steric and electronic properties of NHCs can be varied by changing the nature of the core heterocycle. Complexes of transition metals bearing NHCs based on mono-, di-, tri-, and tetrazoles were obtained.

In this contribution we present an overview of our results in carbene chemistry in last decade:

- Theoretical considerations of electronic structure and properties of various carbenes.
- Methods of synthesis of carbene ligands and their transition metal complexes.
- Design, synthesis and optical properties of iridium-based materials for OLED.
- Applications of Pd, Au, Cu complexes in homogeneous catalysis.



increase in steric bulk and donor properties