

## Abstract

*Heterocycles are an essential class of molecules, assuming a role in many aspects of our life. Indeed heterocyclic nucleus is a common feature of several biomolecules and bioactive compounds including agrochemical products and drugs.*

*In this work we focused on two important classes of heterocyclic compounds: carbazoles and NHCs (N-heterocyclic carbenes).*

*Carbazoles, prevalent as structural motifs in various synthetic materials and naturally occurring alkaloids, as is known, have many applications such as optoelectronic materials, conducting polymers and especially as promising bioactive compounds due to their biological properties, known since 1965.*

*Furthermore NHCs are a class of stable carbenes that over the last few years have entered the field as “new” ligands for bioactive coordination compounds. It has been demonstrated that metal NHC complexes can be used to develop highly efficient metal based drugs with possible applications in the treatment of cancer or infectious diseases.*

*We aimed to design, synthesize and characterize novel carbazole derivatives and NHC metal complexes with the purpose of identifying new biologically active heterocyclic compounds.*