Paraphrasing paragraph about phosphene and alkynyl ligand

Science, Chemistry

According to d-metal organometallic chemistry s, the presence of a single pair on P-atom serves as a donor, while there are empty orbitals on the P-atom, in phosphines, which can behave as “ paid” acceptors, as they overlap with filled d-orbitals on 3-d metal ions.

The pattern of bonding of phosphenes to d-metal comprises of an “ o:” bond from ligand and metal, while there is a “ pai” bond between metal and ligand, in the return direction. This makes the bonding of phosphines to d-metal perfectly analogous to the bonding of CO to a d-metal atom.

A large variety of phosphines are thus possible, while different widely available verities include 1, 1’ (BINAP) and 2, 2’-bis (diphenylphosphino). In such chiral systems, steric constraints come up, that can be resolved into diastereomers. While discussing the reactivity of complexes belonging to phosphine ligands, two properties of these ligands are considered important. These properties relate to their steric bulk and their accepting ability, also called electron-donating ability. (d-Metal ORGANOMETALLIC CHEMISTRY) Alkynyl ligand

Like alkyl groups, alkynyl, alkenyl and aryl groups can bond to a metal form through a single carbon atom. For this property, these groups are described as “ monohapto’. However, there is a possibility of each of these three groups accepting “ pai” electron density into anti-bonding orbitals, although the same has not been observed, largely, so far. This can be ratified by an example, which shows little change in the stretching frequency of the triple

bond in alkynyl complexes, as they attach to a metal; although “ n-1 –alkynyl group” might be considered analogous to a CO group.

As per d-metal organometallic chemistry noting, the displacement of halide with a lithium reagent at a metal center can make way for the introduction of alkynyl groups into organometallic complexes. While looking at the donor-pair scheme of electron counting, alkynyl ligands are considered to be two-electron donors with a single negative charge. (alkenyl, alkynyl, and aryl ligands.