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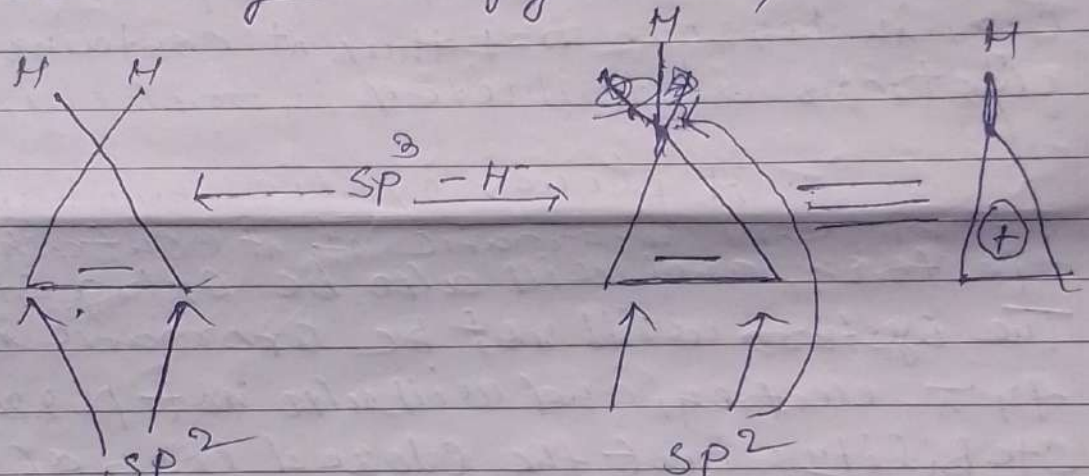
of the bonding molecular orbitals are arranged such that the molecular orbital at the lowest is followed by degenerate orbital pairs. The arrangement of anti bonding orbitals is just opposite, having sets of two degenerate levels and a single highest energy orbitals. In benzene, two electron are required for filling the 1st molecular orbital and then four electron are required for filling each of the next succeeding energy levels.



Non planar
not aromatic
2π electron system

planar
aromatic
2π - electron system

A filled set of bonding molecular orbitals makes a system stable. It resembles to the idea of linking the stability of noble gases to filled of atomic orbitals.

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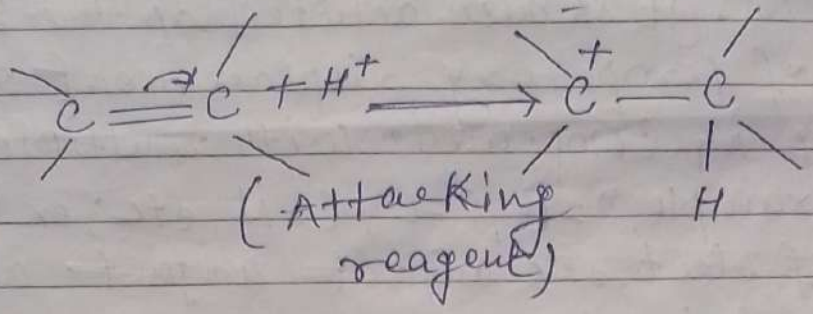
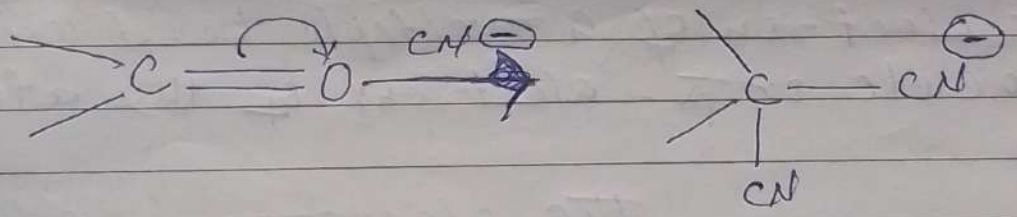
π bond to the atoms to which the attacking agent attaches itself, the effect is called of the positive electromeric effect.



2) Negative Electromeri Effect (-E Effect) When electrons are transferred to an atom other then the atom to which the attacking agent eventully attaches itself. this effect is known as the negative electromeric effect.



Application of Electromeric Effect

1) In unsaturated compounds, electrophic addition reaction involve electromeric effect or polarisation of carbon-carbon double bond in the presence of attacking electrophiles (H^+)

2) In carbonyl compounds, nucleophilic addition reactions involve electromeric effect or polarisation of -E electromeric effect of carbon-oxygen double bond in the presence of

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Electromeric Effect

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The electromeric effect is one in which electrons in several bonded atoms move from one atom to another as per requirement from the attacking reagent. It is also denoted as the E effect. The type of temporary displacement of electrons occurs in compounds with multiple covalent bonds (for example, C=C, C=O, C=N, etc.) or with a lone pair of electrons adjacent to a covalent bond.

The effect includes the complete transfer of a pair of electrons from more than one bond to one atom or from more than one bond to another bond, or from an atom with a free pair of electrons. When there is a '+' and '−' charges in a molecule, it is because of transfer of π electron of a multiple bond within the molecule or π - electrons of the atom.

The electromeric effect only happens when molecules containing multiple bond or one atom with a pair of electrons adjacent to the covalent bond are treated with the attacking reagent and are completely a temporary effect. It disappears as soon as the attacking regent is removed from the reaction mixture.

Types of Electromeric Effect

Two types of Electromeric effect

1) positive Electromeric effect (+E Effect)

The electrons are transferred from the

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Huckel's Rule [(4n+2) π Electron Rule]

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Many aromatic compounds along with benzene are studied to explain the wonder concept of aromaticity. These compounds exhibit common feature, along with planarity and aromatic stability. During the 1930's. Huckel carried out some MO calculations to prove that aromatically is associated with planar cyclic molecule containing 2, 6, 10, 14, (and so on) π-electrons. The series of number is denoted by 4n+2, where n = a positive integer. This is the Huckel's 4n+2 rule which gives the number of π electrons in the p-orbital system, e.g. in benzene n=1 thus it contains six π electrons distributed in molecular orbitals.

A planar cyclic system of unsaturated atoms will aromatic if it contain (4n+2) π electron, and will also be extra stable. The system will not be aromatic if it contain 4n π-electron, and will also not possess aromatic stability; but the closed loop of π electron will result in further destabilisation with repeated to that expected.

These idea are predicted by calculation and conformed by experiment. This rule has become an essential standard for aromaticity. Systems containing 4n π electron are unstable, anti aromatic compounds.

Huckel's rule is successfully used for predicting aromaticity due to the derivability of π MOs. in cyclic conjugated molecule. the energy levels.

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