



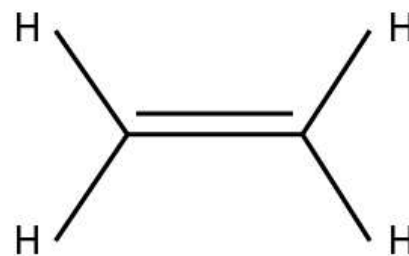
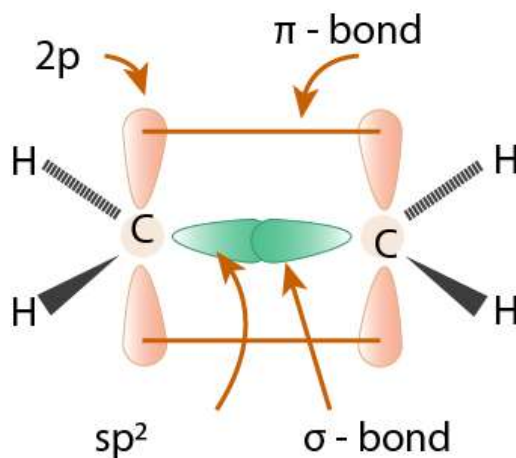
THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

GRADE:11

CHEMISTRY MS

| | |
|----|---|
| 1 | a. sp |
| 2 | b. b.o is inversely proportional to bond length |
| 3 | d. $\text{H}_3\text{PO}_4, \text{HPO}_4^{2-}$ |
| 4 | c. BF_3 |
| 5 | d. $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$ |
| | SECTION B |
| 6 | NH_3 because the lone pair of electrons on nitrogen is not balanced by hydrogen atoms. |
| 7 | It is due to common ion effect. When NH_4OH is added to NH_4Cl the concentration of ammonium ion increases. |
| 8 | $K_p = K_c (RT)^{\Delta n}$ $K_p = 2.2 \times 10^{-4} \times 0.0821 \times 298 = 5.28 \times 10^{-4}$ |
| 9. | During the formation of $\text{CH}_2=\text{CH}_2$, the electronic configuration of carbon in its ground state ($1s^2 2s^2 2p^1 2p^1$) will change to an excited state and change to $1s^2 2s^1 2p_x^1 2p_y^1 2p_z^1$. In the excited state, since carbon needs electrons to form bonds one of the electrons from $2s^2$ orbital will be shifted to the empty $2p_z$ orbital to give 4 unpaired electrons. |

Hybridization of Ethene



Ethene

- 10 The molecule O_2 has the following molecular orbital configuration:
 $\sigma 1s^2, *1s^2, \sigma^2s^2, *2s^2, \sigma^2pz^2, 2px^2, \pi^2py^2, 2px^{1*}, 2py^{1*}$
 There are 10 bonding and 6 nonbonding electrons in the orbitals according to the molecular orbital configuration.
 According to the molecular orbital configuration, there are 10 bonding and 6 nonbonding electrons in the orbitals.
 Therefore, Bond order = $\frac{1}{2}[\text{Bonding} - \text{antibonding}]$
 $= \frac{1}{2}[10 - 6] = \frac{1}{2}(4) = 2$
 As a result, the bond order of $= \frac{1}{2}[10 - 6] = \frac{1}{2}(4) = 2$ is 2.
 Similarly for others,
 For O_2^+ molecule, an electron is removed from $*2p_y$ orbital.
 Bond order = $\frac{10 - 5}{2} = 2.5$
 For O_2^- molecule, an electron is added to $\pi^* 2p_x$ orbital.
 \therefore Bond order = $\frac{10 - 7}{2} = 1.5$

- 11
1. increase amount of SO_2, O_2
 2. high pressure as volume decreases
 3. low temperature.