

HALOALKANES & HALOARENES 1.

Lecture-16

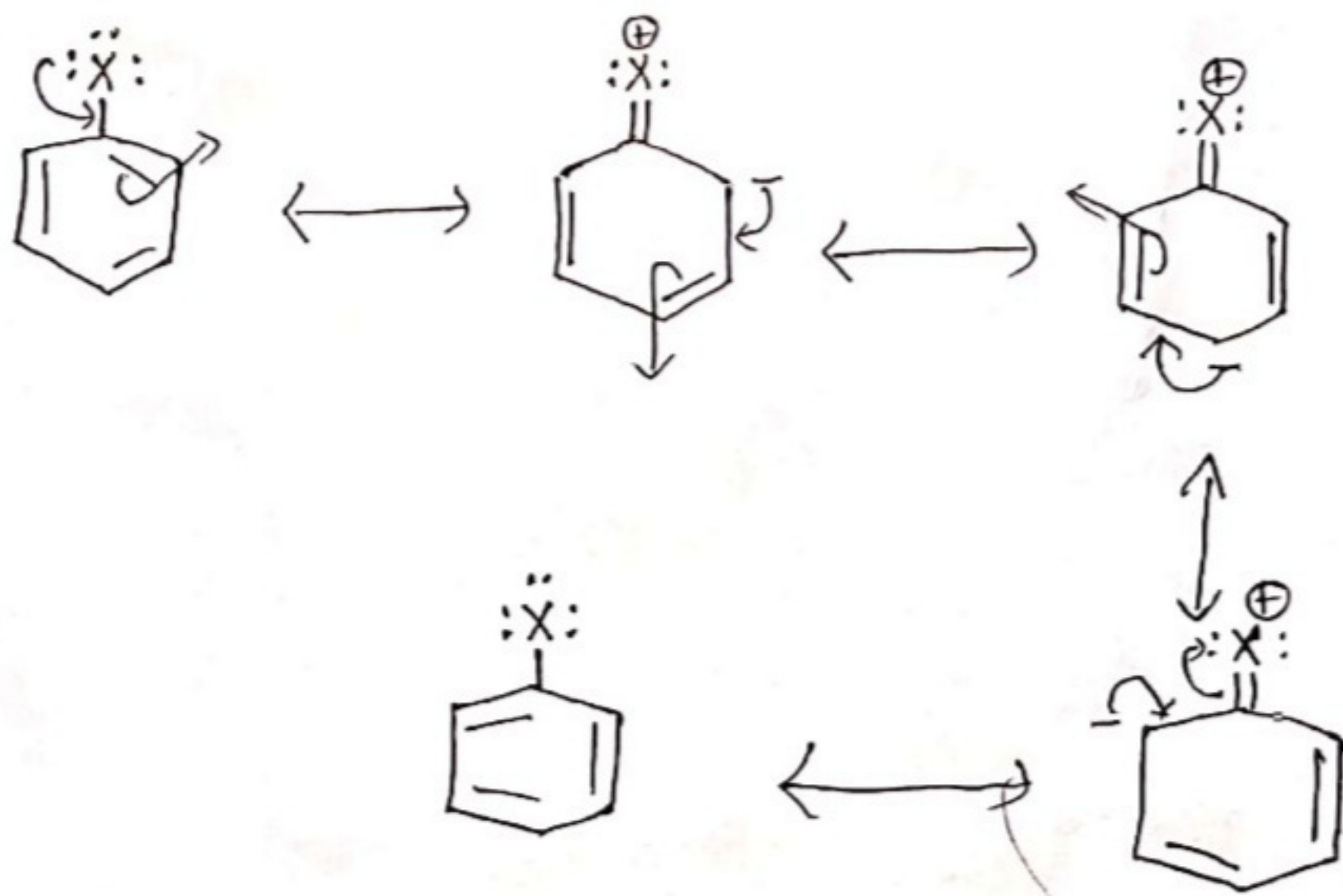
CHEMISTRY, CLASS-XII, UNIT-10, 15/07/2020

Topic - Reactions of Haloarenes

Nucleophilic Substitution

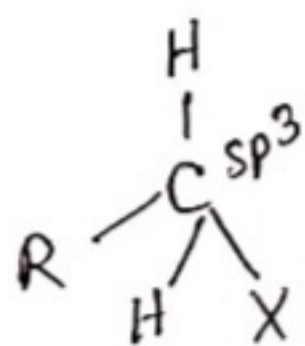
Aryl halides are extremely less reactive towards nucleophilic substitution reactions due to the following reasons:

- Resonance effect: - Due to resonance C-Cl bond acquires a partial double bond character due to resonance. As a result, the bond cleavage in haloarenes is difficult than haloalkane and hence they are less reactive towards nucleophilic substitution reactions.

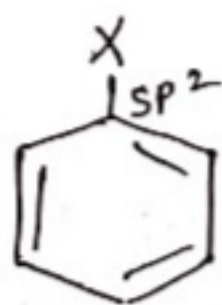


By-Dr.Rinky

ii) Difference in hybridisation of carbon atom in c-x bond.



Haloalkane



Haloarene

In haloarene, the sp^2 hybridised carbon with a greater s-character is more electronegative and can hold the electron pair of c-x bond more tightly than sp^3 hybridised carbon in haloalkane with less s-character.

C-Cl bond length in haloalkane = 177 pm

Where C-Cl bond " " haloarene = 169 pm

Since, shorter bond length is stronger hence haloarene are less reactive than haloalkane towards nucleophilic substitution reaction.

iii) Instability of phenyl cation: - In case of Haloarenes, the phenyl cation formed as a result of self-ionisation will not be stabilised by resonance and therefore, S_N1 mechanism ruled out.

iv) Because of the possible repulsion, it is less likely for the electron rich nucleophile to approach electron rich arenes.

To be Continued in next lecture..