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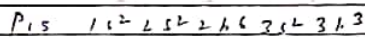
CHEMISTRY

TOPIC - CHEMICAL BONDING

Q. Are all the five kinds of P-Cl bonds equivalent? Answer: All the five kinds of P-Cl bonds are not identical.

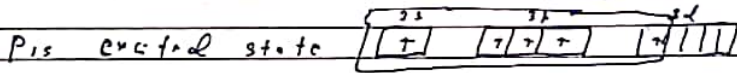
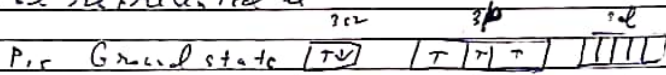
This can be explained on the basis of its structure.

Atomic no. of Phosphorus is 15 its electronic configuration is written as

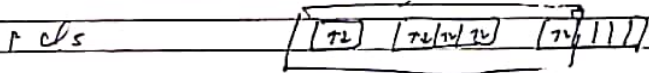


In orbital box diagram valence electron

can be represented as



sp³ hybridisation



filled by electron pairs donated by five chlorine atoms.

one s thru p orbital and one d orbital undergoes sp³d hybridisation and produces five equivalent sp³d orbitals.

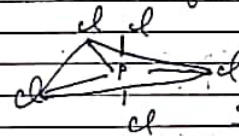
All five sp³d orbital overlaps with singly occupied p orbital of Cl atom and forms five P-Cl sigma bonds.

Three P-Cl bond lie in one plane and make angle of 120° with each other. These bonds are called equatorial bonds.

The remaining two P-Cl bonds among which one lie above and other lie below the plane and makes angle of 90°

These bonds are axial bonds. As the axial bond pair suffers more repulsion force from equatorial bond pairs.

Axial bond is slightly longer than equatorial bond. Therefore axial bond is slightly weaker than equatorial bond.



Due to this P-Cl is REACTIVE.

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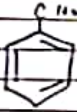
Alanta Officers

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CHEMISTRY

TOPIC :: BENZALDEHYDE

Molecular formula of Benzaldehyde is:

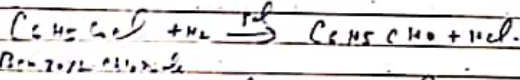
C_6H_5CHO . Its structural formula is written as



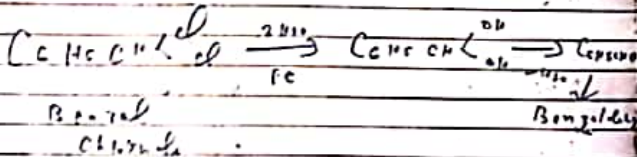
Benzaldehyde is prepared as follows...

(i) Reduction of BENZOYL CHLORIDE produces

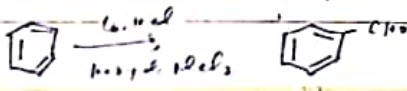
C_6H_5CHO (Benzaldehyde) Reducing agent used are H_2 and Zn . In this reaction it acts as catalyst.



(ii) Benzal chloride on hydrolysis followed by dehydration gives rise to Benzaldehyde.

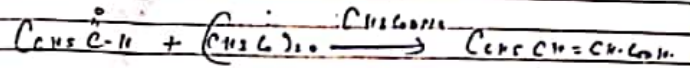


(iii) Benzene on reaction with CO and HCl in presence of $AlCl_3$ yields produces C_6H_5CHO

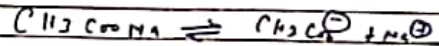


Benzaldehyde on reaction with $(CH_3CO)_2O$ in presence of CH_3COONa gives rise to

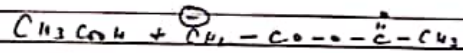
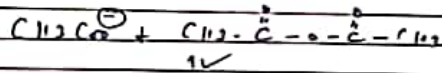
$C_6H_5CH=CHCOOH$ (Cinnamic acid)



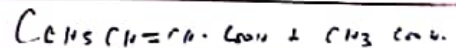
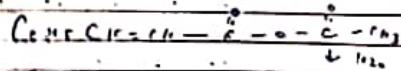
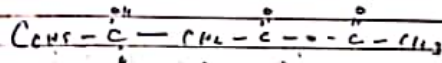
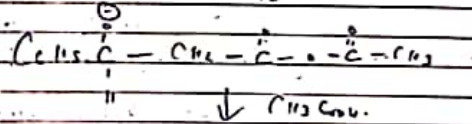
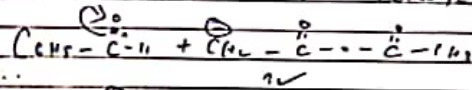
The mechanism of the reaction is concerned following steps followed.



acetate anion acts as base and abstracts proton from α -carbon and acylium ion C^+ attacks the carbonyl carbon.



This contains a H^+ on carbonyl carbon



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