CO

$$C + O_2 \xrightarrow[\text{(limit)}]{} CO$$

$$HCOOH + \text{Conc.}\ H_2SO_4 \longrightarrow CO + H_2O$$

$$\begin{matrix} COOH \\ | \\ COOH \end{matrix} + \text{Conc.}\ H_2SO_4 \longrightarrow CO + CO_2 + H_2O$$

$$K_4[Fe(CN)_6] + \text{conc.}H_2SO_4 \longrightarrow K_2SO_4 + FeSO_4 + HCN$$

$$HCN + \text{conc.}H_2SO_4 \longrightarrow HCOOH + NH_3$$

$$NH_3 + \text{conc.}H_2SO_4 \longrightarrow (NH_4)_2SO_4$$

$$HCOOH + \text{conc.}H_2SO_4 \longrightarrow \underline{CO} + H_2O$$

Prop.

(1) Colourless but burn with Blue flames

(2) $CO + PdCl_2 + H_2O \longrightarrow Pd + CO_2 + HCl$

(3) almost insoluble in water (black ppt.)

(4) CO is good Reducing agent

(5) Poisonous

Industrial prep.

$$CH_4 + H_2O \longrightarrow CO + H_2$$

$$C + H_2O \xrightarrow{473K-1273K} CO + H_2$$

Water gas
Syngas
Synthesis gas

Bosch Process
Water gas shift reaction

$$CO + H_2 + \underset{(H_2O)}{\text{Steam}} \longrightarrow CO_2 + H_2$$

Catalyst → iron oxide and chromium oxide

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CO_2

sp

linear

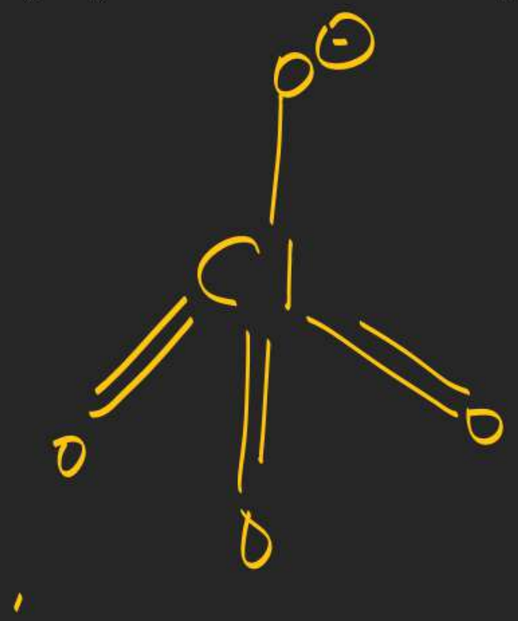
180

green House effect

Chemical bonding

114. Total number of resonating structure possible of the molecule ClO_4^- is -

(A) 2 (B) 3 (C) 4 (D) 5



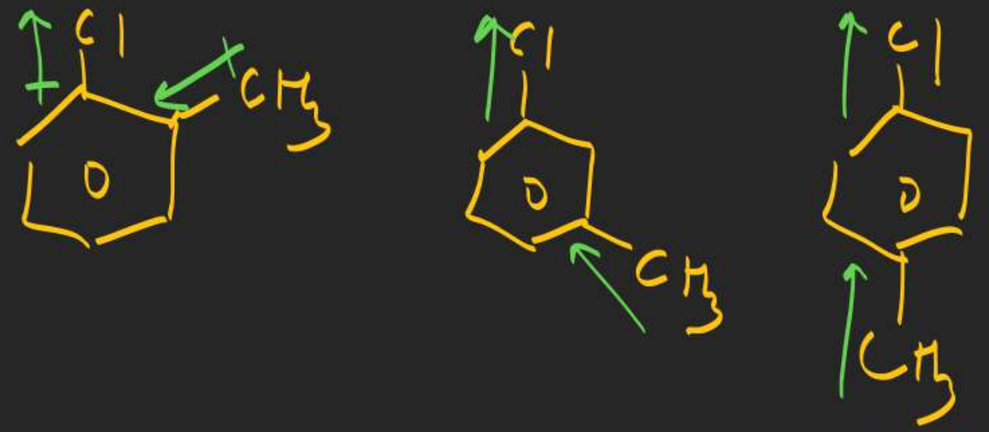
Chemical bonding

130. Arrange the following in increasing order of their polarity.

(I) Ortho/chloro/Toluene

(II) Meta/chloro/Toluene

(III) Para/chloro/Toluene



(A) III > II > I (B) II < I > III (C) III > I > II (D) I < II < III

Chemical bonding

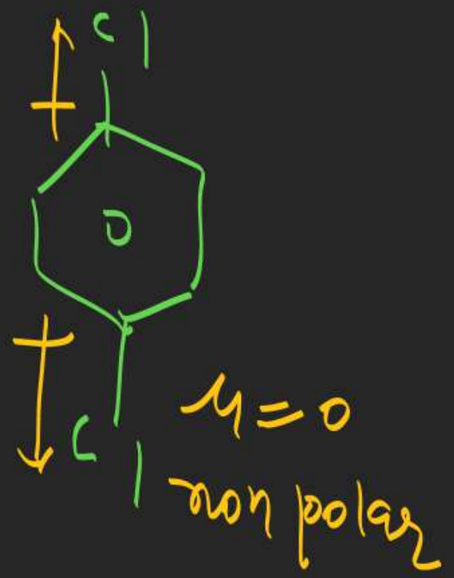
131. Which of the following molecule / species is polar.

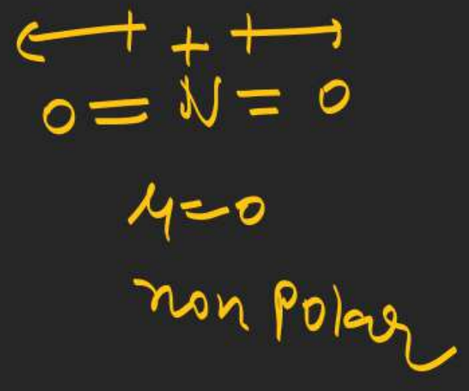
(A) O_3

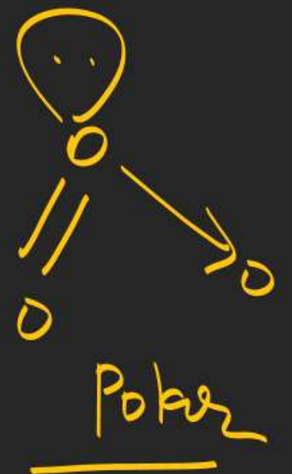
(B) NO_2^+

(C) paradichlorobenzene

(D) None of these







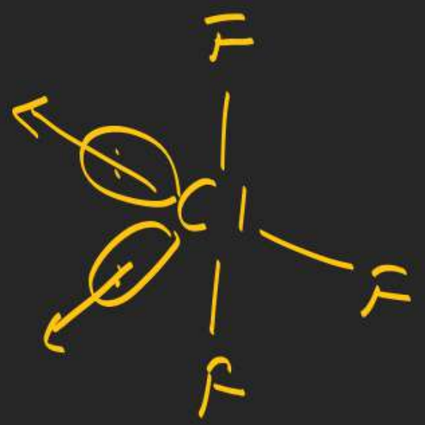
Chemical bonding

132. Which of the following molecule is non polar?

(A) NF_3 (B) ClF_3 (C) XeO_3 (D) SO_3

$\mu \neq 0$

Polar

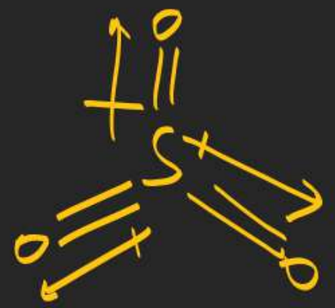


$\mu \neq 0$

Polar

$\mu \neq 0$

Polar



$\mu = 0$

nonpolar

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Chemical bonding

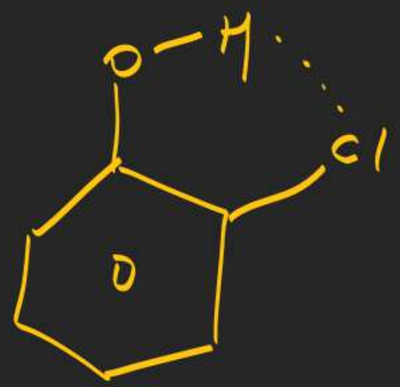
133. Which of the following have intramolecular H-bonding?

(A) Chloral

(B) Orthochlorophenol

(C) Paranitrophenol

(D) C_6H_6



Chemical bonding

134. What is the order of boiling point of the following compounds ?

HF, NH_3, H_2O, CH_4

(A) $CH_4 > NH_3 > H_2O > CH_4$

(B) $HF > H_2O > NH_3 > CH_4$

(C) $H_2O > HF > NH_3 > CH_4$

(D) $H_2O > NH_3 > HF > CH_4$

$H_2O > HF > NH_3 > CH_4$

Extent of H-Bonding is Higher than HF

Chemical bonding

135. Which of the following have weakest intermoleculear forces?

(A) CH_3COOH

(B) 

(C) 

$\mu = 0$

non polar

(D) H_2O_2

$\mu \neq 0$

polar

Chemical bonding

136. Select the INCORRECT statement ?

(A) Cationic part of NH_4F can form hydrogen bond with water

(B) Hydrogen bonding is not present in ethene $(H_2C = CH_2)$

(C) Anionic part of $NaHCO_3$ have inter molecular hydrogen bonding

(D) Vapour pressure decreases due to intramolecular H-bonding.

(O)

Chemical bonding

137. The strength of H-bonding order is

(A) $H_2O > H_2O_2 > HF$

(B) $H_2O_2 > H_2O > HF$

(C) $HF > H_2O > H_2O_2$

(D) $HF = H_2O = H_2O_2$

HF > H2O > H2O2

Chemical bonding

138. Give the correct order of initials T or F for following statements. Use T if statement is true and F if it is false.

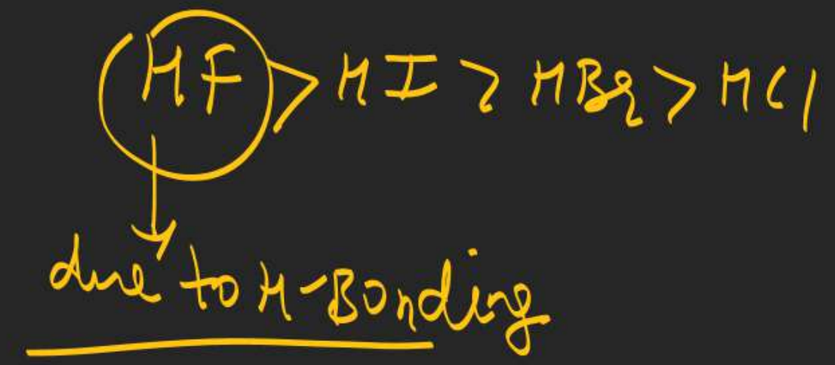
(i) HF boils at a higher temperature than HCl

(ii) HBr boils at lower temperature than HI

(iii) Ka_1 of maleic acid is higher than that of fumaric acid

(iv) Ka_2 of maleic acid is higher than that of fumaric acid

(A) TFTT (B) TTTF (C) TFTF (D) TTTT



Chemical bonding

139. Strongest hydrogen bond present in :

(A) $O - H \cdots S$

(B) $S - H \cdots O$

(C) $F - H \cdots F$

(D) $F - H \cdots O$

Chemical bonding

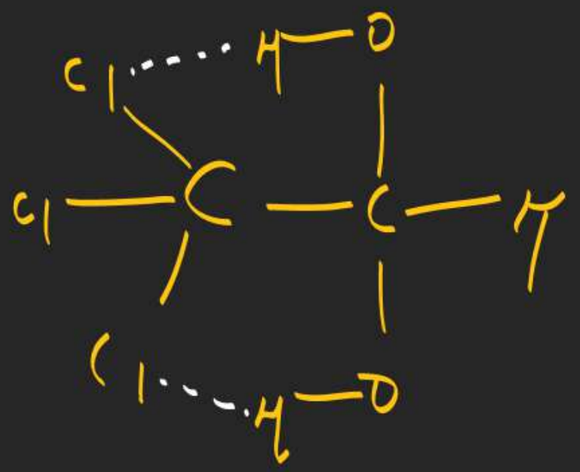
140. Which of the following will prefer intramolecular hydrogen bonding :

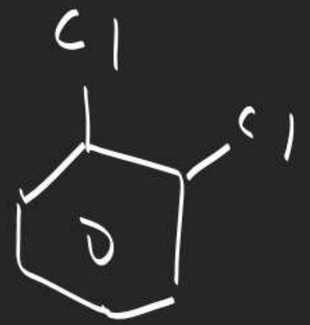
(A) $CCl_3CHO \cdot H_2O$

(B) Orthodichlorobenzene

(C) Sulphuric acid

(D) Both (A) & (B)





Intra

Chemical bonding

141. Which of the following is correct order for extent of Hydrogen Bonding

(A) $H_2O_2 > H_2O > HF > NH_3$

(B) $H_2O > HF > NH_3 > H_2O_2$

(C) $H_2O_2 > H_2O > NH_3 > HF$

(D) $H_2O_2 > NH_3 > H_2O > HF$

Chemical bonding

142. Which is correct about D_2O

(A) Its boiling point is higher than that of $H_2O(\ell)$

(B) $O - D \cdots\cdots O$ bond is stronger than $O - H \cdots\cdots O$ bond.

(C) $D_2O(s)$ sinks in $H_2O(\ell)$.

(D) all the above are correct.

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Chemical bonding

143. Which of the following do not exist?

(A) KHF_2 (B) $CsHCl_2$ (C) $KHCl_2$ (D) KF

$KHCl_2$

$HCl_2^{\ominus}$ ion donot have H-Bonding

it exist with large size cation

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Chemical bonding

144. Which of the following species is an example of odd electron molecule?

(A) NO_2 (B) N_2O (C) ClO_3 (D) Both (A) and (C)

$N \equiv N \rightarrow O$