

JEE-Main-25-06-2022-Shift-1 (Memory Based)

Chemistry

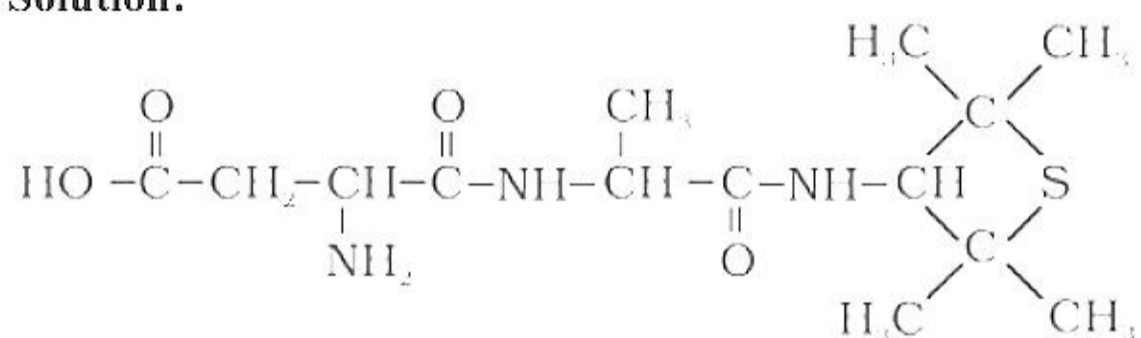
Question: Which of the following is artificial sweetener?

Options:

- (a) Bithional
- (b) Alitame
- (c) Lactose
- (d) Salvarsan

Answer: (b)

Solution:



Sweetness value of Alitame is 2000

Question: Which has highest ionic mobility in aqueous solution?

Options:

- (a) Be²⁺
- (b) Mg²⁺
- (c) Ba²⁺
- (d) Sr²⁺

Answer: (c)

Solution: Due to the high heat of hydration of small cations, ionic mobility for the small cations is low. Order of ionic mobility is Be²⁺ < Mg²⁺ < Sr²⁺ < Ba²⁺

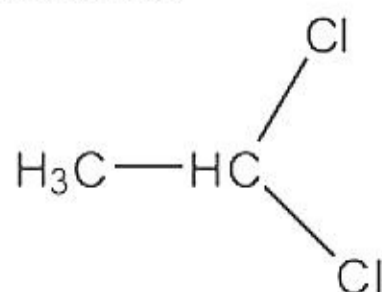
Question: IUPAC of ethylidene chloride

Options:

- (a) 1,1-Dichloroethane
- (b) 1,2- Dichloromethane
- (c) 1,2- Trichloroethane
- (d) None of these

Answer: (a)

Solution:



1,1-Dichloroethane

Question: Entropy change = $550 \text{ Jk}^{-1} \text{ mol}^{-1}$

Enthalpy change = -165 kJ mol^{-1}

Find temperature at equilibrium.

Options:

(a) 300 K

(b) 500 K

(c) 600 K

(d) 700 K

Answer: (a)

Solution:

$$\Delta S = 550 \text{ JK}^{-1}$$

$$\Delta H = -165 \text{ kJ mol}^{-1}$$

$$\Delta G = \Delta H - T\Delta S$$

At equilibrium, $\Delta G = 0$

$$0 = \Delta H - T\Delta S$$

$$550 T = 165000$$

$$T = \frac{165000}{550} = 300 \text{ K}$$

Question: Intermediate in Reimer tiemann reaction

Options:

(a) Carbene

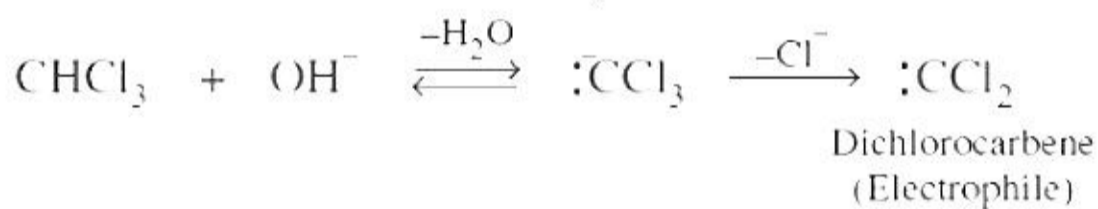
(b) Carbanion

(c) Carbocation

(d) None of these

Answer: (a)

Solution: Generation of electrophile



Question: Intermediate in Hoffmann Bromamide reaction

Options:

(a) Nitrene

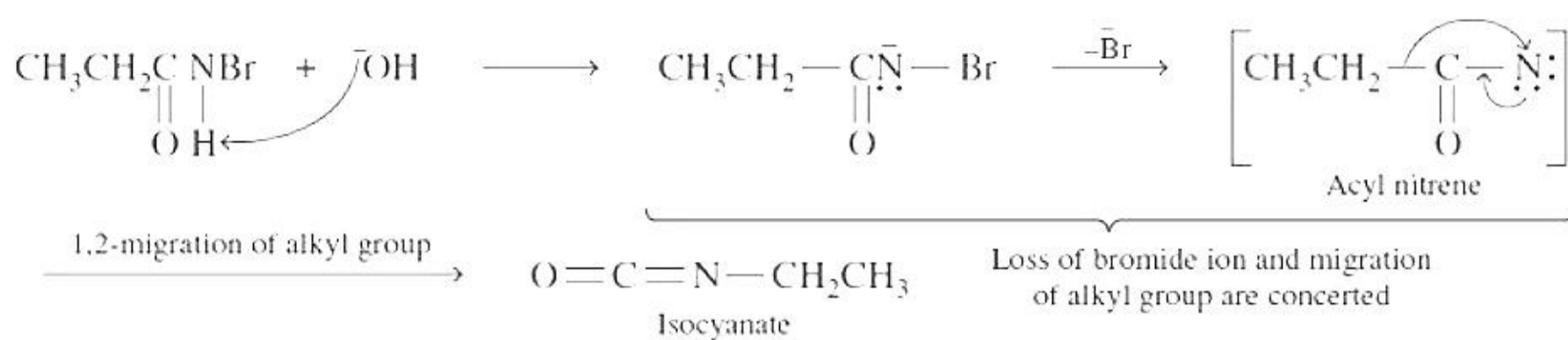
(b) Carbanion

(c) Carbocation

(d) None of these

Answer: (a)

Solution:



Question: Free radical polymerisation can take place in ____

Options:

- (a) Terylene
- (b) Melamine
- (c) Nylon 6, 6
- (d) Teflon

Answer: (d)

Solution: Teflon is synthesized using a free radical polymerization technique.

Question: Which of the following is incorrect about Tyndall effect?

Options:

- (a) Greater difference in refractive index
- (b) Diameter of dispersed particles is less than the wavelength of incident light
- (c) Use to differentiate two colloidal solutions
- (d) Suspensions show Tyndall effect

Answer: (b)

Solution: The diameter of the dispersed particles is not much smaller than wavelength of the light used. The refractive indices of the dispersed phase and the dispersion medium differ greatly in magnitude.

Question: In 681 g of $\text{C}_7\text{H}_5\text{N}_3\text{O}_6$ the number of nitrogen atoms are $x \times 10^{21}$. What is the value of x ?

Options:

- (a) 2271.2
- (b) 3429.7
- (c) 4217.5
- (d) 5419.8

Answer: (d)

Solution: Molar mass of $\text{C}_7\text{H}_5\text{N}_3\text{O}_6 = 84 + 5 + 42 + 96 = 227 \text{ g mol}^{-1}$

$$\text{No. of moles} = \frac{681}{227} = 3 \text{ moles}$$

$$\begin{aligned}
 \text{No. of N atoms} &= 3 \times 3 \times 6.022 \times 10^{23} \\
 &= 5.4198 \times 10^{24} \\
 &= 5419.8 \times 10^{21} \\
 x &= 5419.8
 \end{aligned}$$

Question: Which of the following strongest oxidizing agent?

Options:

- (a) Mn^{3+}
- (b) Cr^{3+}
- (c) Ti^{3+}
- (d) Fe^{3+}

Answer: (a)

Solution: Mn^{3+} is strong oxidizing agent because Mn^{3+} can easily be converted into Mn^{2+} having d^5 configuration which is stable half-filled configuration.

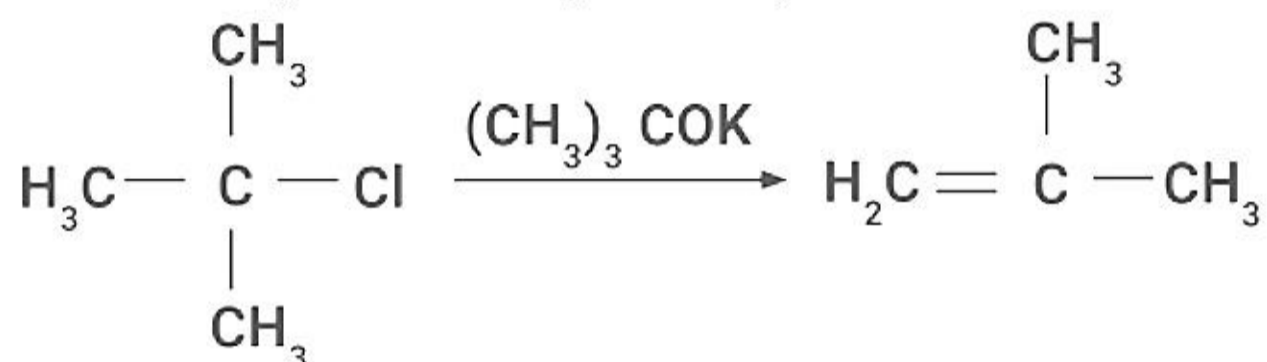
Question: $(\text{CH}_3)_3\text{CCl} + (\text{CH}_3)_3\text{COK}$ gives?

Options:

- (a) SN_1
- (b) SN_2
- (c) E_1
- (d) E_2

Answer: (d)

Solution: Bulky base and bulky substrate prefers E_2 mechanism



Question: What is eutrophication?

Options:

- (a) Loss in biodiversity
- (b) Increase in biodiversity
- (c) Break down of Organic matter
- (d) High biodegradability

Answer: (a)

Solution: It results in loss of oxygen and in subsequent loss of biodiversity known as Eutrophication.

Question: Phenol reacted with nitric acid which gives two products. Which is the best method to separate the products?

Options:

- (a) Steam distillation
- (b) Fractional crystallization
- (c) Sublimation
- (d) Chromatographic separation

Answer: (a)

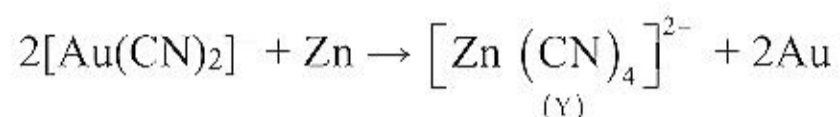
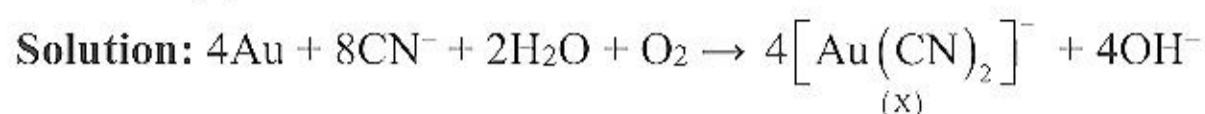
Solution: o-nitrophenol and p-nitro-phenol can be separated by steam distillation. Ortho nitro-phenol is steam volatile (intra molecular hydrogen bonding) whereas p-nitro phenol is least steam volatile when compared to the ortho nitro-phenol due to inter molecular hydrogen bonding.

Question: In the leaching of gold when NaCN is added the complex formed is X which when on addition of Zn forms Y. X and Y are respectively

Options:

- (a) $[\text{Au}(\text{CN})_2]$ and $[\text{Zn}(\text{CN})_4]^{2-}$
- (b) $[\text{Au}(\text{CN})_4]^{2-}$ and $[\text{Zn}(\text{CN})_4]^{2-}$
- (c) $[\text{Au}(\text{CN})_2]^-$ and $[\text{Zn}(\text{CN})_4]^-$
- (d) None

Answer: (a)



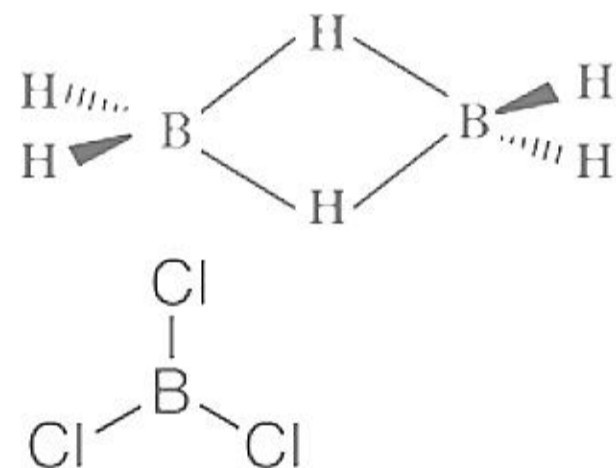
Question: e^- deficient species are PH_3 , B_2H_6 , CCl_4 , NH_3 , LiH , BCl_3 =?

Options:

- (a) PH_3 , B_2H_6
- (b) CCl_4 , NH_3
- (c) BCl_3 , B_2H_6
- (d) LiH , BCl_3

Answer: (c)

Solution: In BCl_3 , Boron has 3 valence electrons, after forming bonds with chlorine electrons around it increases to 6, but it still is short of 2 electrons. In B_2H_6 , B forms 3 $\text{C}-2e^-$ bond and has less number of electrons. Hence, these are electron deficient species.



Question: Which of the following are isoelectronic?

Options:

- (a) HF and H_2O
- (b) CH_4 and SF_6
- (c) O_2 and O_3
- (d) H_2 and F_2

Answer: (a)

Solution:

$$\text{HF} = 1 + 9 = 10$$

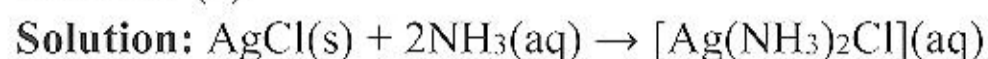
$$\text{H}_2\text{O} = 2 + 8 = 10$$

Question: Product formed on reaction of AgCl with aq NH_3

Options:

- (a) $[\text{Ag}(\text{NH}_3)_4]\text{Cl}$
- (b) $[\text{Ag}(\text{NH}_3)_2]\text{Cl}_2$
- (c) $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$
- (d) $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$

Answer: (c)



Question: The ratio of speed of electron in the 3rd orbit of helium to the speed of 3rd orbit of halogen

Options:

- (a) 1:1
- (b) 2:1
- (c) 1:2
- (d) 4:1

Answer: (b)

Solution: $V \propto \frac{Z}{n}$

$$V = 2.188 \times 10^6 \frac{Z}{n} \text{ m}$$

2:1

Question: Value of BOD of clean and polluted water

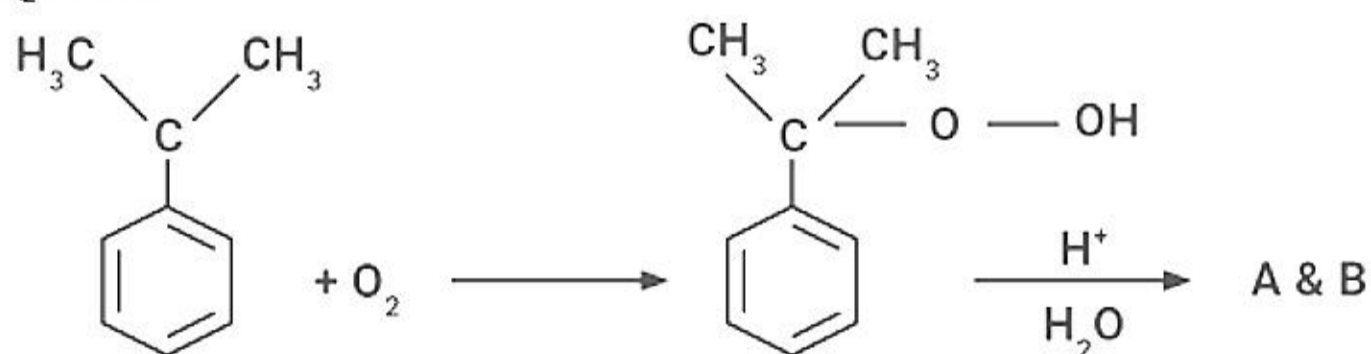
Options:

- (a) Clean water < 5ppm, Polluted water < 10ppm
- (b) Clean water > 5ppm, Polluted water < 10ppm
- (c) Clean water > 5ppm, Polluted water > 10ppm
- (d) Clean water > 10ppm, Polluted water > 20ppm

Answer: (a)

Solution: BOD of clean water is 3–5 ppm and polluted water is 6–9 ppm.

Question:

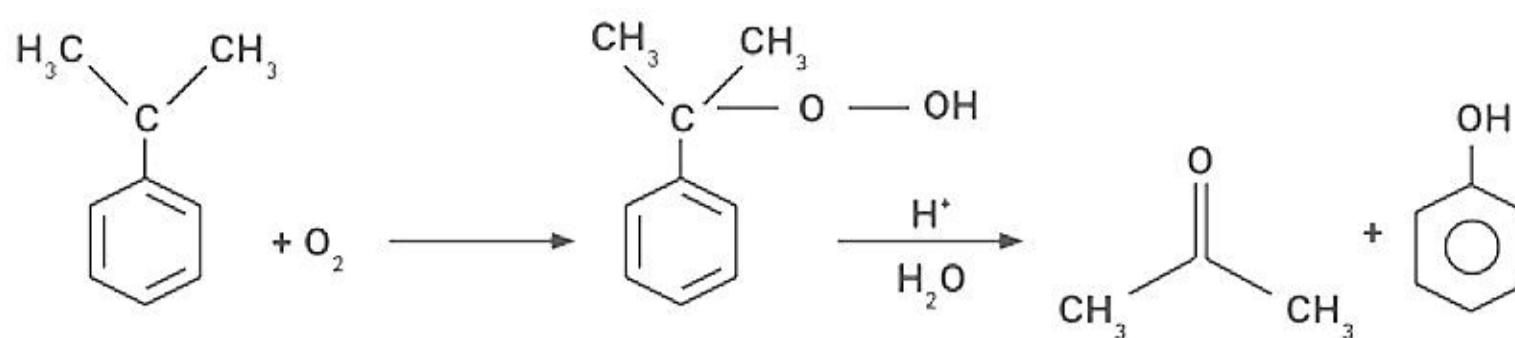


Options:

- (a) Acetone-A, Phenol-B
- (b) Acetaldehyde-A, Phenol-B
- (c) Acetophenone-A, Ethanal-B
- (d) Benzaldehyde-A, Ethanal -B

Answer: (a)

Solution:



Question: How many will be strongly bonded when one electron is removed?

NO, O₂, N₂, B₂

Answer: 2.00

Solution: NO and O₂

$$\text{Bond order of NO} = \frac{N_B - N_A}{2} = \frac{10 - 5}{2} = 2.5$$

$$\text{Bond order of NO}^+ = \frac{N_B - N_A}{2} = \frac{10 - 4}{2} = 3$$

$$\text{Bond order of O}_2 = \frac{N_B - N_A}{2} = \frac{10 - 6}{2} = 2$$

$$\text{Bond order of O}_2^+ = \frac{N_B - N_A}{2} = \frac{10 - 5}{2} = 2.5$$