JEE-Main-25-07-2022-Shift-2 (Memory Based)

Chemistry

Question: Which of the following is herbicides?

Options: (a) DDT

(b) Aldrin

(c) Sodium arsenite

(d) Dieldrin Answer: (c)

Solution: Sodium arsenite is a herbicide

Question: Micelle formation is

Options:

(a) Exothermic, $\Delta S > 0$

(b) Endothermic, $\Delta S < 0$

(c) Exothermic, $\Delta S < 0$

(d) Endothermic, $\Delta S > 0$

Answer: (d)

Solution: $\Delta S > 0$ for micelle formation and the process is endothermic at low temperature.

Question: Glycosidic linkage between alpha glucose and beta fructose is present in

Options:

(a) lactose

(b) Sucrose

(c) Maltose

(d) None of these

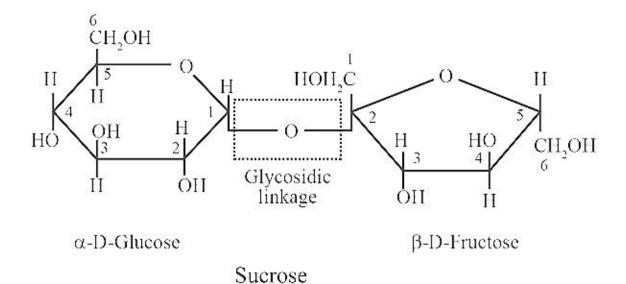
Answer: (b)

Solution: Sucrose: One of the Common disaccharides is sucrose which on hydrolysis gives equimolar mixture of D-(+)-glucose and D-(-) fructose.

$$C_{12} H_{22} O_{11} + H_2 O \to C_6 H_{12} O_6 + C_6 H_{12} O_6 \\ \text{Sucrose} \qquad D - (+) - Glucose \qquad D - (-) - Fructose$$

These two monosaccharides are held together by a glycosidic linkage between C1 of α -D-glucose and C2 of β -D-fructose. Since the reducing groups of glucose and fructose are involved in glycosidic bond formation, sucrose is a non reducing sugar.





Question: What is the correct order of density for group 2 elements?

Options:

(a) Bc > Mg > Ca > Sr

(b) Ca > Mg > Be > Sr

(c) $Mg \le Ca \le Sr \le Be$

(d) $Ca \le Mg \le Be \le Sr$

Answer: (d)

Solution: The size of alkali metals increases down the group, and volume also shows an increase. Since volume is inversely proportional to the density, there is an increase in the volume, which is lesser than increasing mass in the case of Sr and Ba. So as moving down the group, density decreases first and then increases.

Question: What is the hybridization of Xe in the following compounds XeO₃, XeF₆, XeO₂F₂ Options:

(a) XeO_3-sp^3 , $XeF_6-sp^3d^3$, $XeO_2F_2-sp^3d$

(b) XeO₃-sp³d, XeF₆-sp³, XeO₂F₂-sp³d³

 $(c) \ XeO_3 - sp^3d^2, \ XeF_6 - sp^3, \ XeO_2F_2 - sp^3$

(d) XeO₃-sp³d, XeF₆-sp³d², XeO₂F₂-sp³d

Answer: (a)

Solution: Hybridization of Xe in

 $XeO_3 \Rightarrow sp^3$ $XeF_6 \Rightarrow sp^3d^3$ $XeO_2F_2 \Rightarrow sp^3d$

Question: 99.9 % pure dihydrogen can be prepared by

Options:

- (a) Reaction of methane with steam
- (b) Mixing natural hydrocarbons of high molecular weight
- (c) Electrolysis of water
- (d) Reaction of salts like hydride with water

Answer: (c)

Solution: Highly pure hydrogen can be obtained by electrolysis of water.

It is the decomposition of water into O₂ & H₂ gas by passing electric current.

At anode, $6H_2O(1) \rightarrow O_2(g) + 4H_3O^+ + 4e$ cathode, $4e^- + 4H_2O(1) \rightarrow 2H_2(g) + 4OH^-(ag)$



Overall \rightarrow 2H₂O(l) \rightarrow 2H₂(g) + O₂(g)

Question: The first ionization energy order B, Be, C, O, N among is _____

Options:

- (a) $B \le Be \le C \le O \le N$
- (b) $B \le Be \le C \le N \le O$
- (c) Be \leq B \leq C \leq N \leq O
- (d) Be \leq B \leq C \leq O \leq N

Answer: (a)

Solution: The ionisation energy increases across a period as atomic size decrease

Therefore, correct order is $B \le Be \le C \le O \le N$

Question: Drugs which do not bind to its active site is called

Options:

- (a) Allosteric site
- (b) Non active site
- (c) Both (a) and (b)
- (d) None of the above

Answer: (a)

Solution: Some drugs do not bind to enzyme's active site.

These bind to a different site of enzyme called allosteric site

Question: Match the following.

N. 780	
Column-I (polymer)	Column-II (Uses)
(A) Nylon 6	(i) non sticking Utensils
(B) HDP	(ii) Buckets
(C) LDP	(iii) Brush Bristles
(D) Teflon	(iv) Toys

Options:

- (a) $A \rightarrow (i)$; $B \rightarrow (iii)$; $C \rightarrow (iv)$; $D \rightarrow (ii)$
- (b) $A \rightarrow (iii)$; $B \rightarrow (ii)$; $C \rightarrow (iv)$; $D \rightarrow (i)$
- (c) $A \rightarrow (ii)$; $B \rightarrow (i)$; $C \rightarrow (iv)$; $D \rightarrow (iii)$
- (d) $A \rightarrow (iv)$; $B \rightarrow (iii)$; $C \rightarrow (ii)$; $D \rightarrow (i)$

Answer: (b)

Solution:

- (A) Nylon $6 \Rightarrow$ (iii) Brush Bristles
- (B) $HDP \Rightarrow (ii)$ Buckets
- (C) LDP \Rightarrow (iv) Toys
- (D) Teflon \Rightarrow (i) non sticking Utensils

Question: Statement-I: Pig iron can be obtained from cast Iron.

Statement-II: Cast iron has least carbon content

Options:

- (a) Both Statement I and Statement II are correct.
- (b) Both Statement I and Statement II are incorrect.
- (c) Statement I is correct, but Statement II is incorrect.



(d) Statement I is incorrect, but Statement II is correct.

Answer: (b)

Solution: Cast iron is made from pig iron Wrought iron has least carbon content

Both S-I and S-II are false

Question: $CH_3 - CH_2 - CN \xrightarrow{CH_3MgBr} A \xrightarrow{H_3O^+} B \xrightarrow{Zn.Hg/HCI} C$

What is C? **Options:**

(a) CH₃CH₂CH₃

(b) CH₃CH₂CH₂OH

(c) CH₃CH₂CH₂CH₃

(d) CH₃CH₂COCH₃

Answer: (c) Solution:

$$CH_{3}CH_{2}CN \xrightarrow{CH_{3}MgBr} CH_{3}CH_{2}-C=N-MgBr$$

$$CH_{3}CH_{2}-C=N-MgBr$$

$$CH_{3}-CH_{2}-C-CH_{3}$$

$$(B)$$

$$CH_{3}-CH_{2}-CH_{2}-CH_{3}$$

$$CH_{3}-CH_{2}-CH_{2}-CH_{3}$$

$$(C)$$

Question: Which of the following is correct decreasing order of acidity?

$$(A) \bigcap_{NO_2} OH OH OH OH OH OH OH OH OH OCH_3$$

Options:

(a)
$$A > B > C > D$$

(b)
$$B > C > A > D$$

(c)
$$C > A > B > D$$

(d)
$$D > A > B > C$$



Answer: (a)

Solution:

A shows -I effect, -m effect

B shows -I effect due to -NO2 group

C shows -I effect due to -OCH3 group

D shows +m effect and -I but +m effect is dominating here

 \therefore Order is A > B > C > D

Question: Methyl orange structure at end point?

Options:

- (a) Quinoid form
- (b) Benzenoid form
- (c) Both (a) and (b)
- (d) None of these

Answer: (a)

Solution:

Question: Mn³⁺/Mn²⁻, Fe³⁻/Fe²⁺, Cr³⁺/Cr²⁺, Co³⁺/Co²⁻. Find the magnetic moment in M²⁺ which has negative E_{red}.

Answer: 4.90



Solution:

$$E_{Mn^{3-}/Mn^{2+}}^{o} = +1.57$$

$$E_{Fe^{3+}/Fe^{2+}}^{o} = +0.77$$

$$E_{Co^{3+}/Co^{2+}}^{o} = +1.97$$

$$E_{Cr^{3+}/Cr^{2+}}^{o} = -0.41$$

Magnetic moment of $Cr^{2+} = \sqrt{4(4+2)} = 4.9 \text{ BM}$

Question: XeO₃, XeF₆, XeO₂F₂ sum of lone pair of central atom is ____

Answer: 3.00

Solution:

 $XeO_3 \Rightarrow 1$ lone pair

 $XeF_6 \Rightarrow 1$ lone pair

 $XeO_2F_2 \Rightarrow 1$ lone pair

Sum = 1 + 1 + 1 = 3 lone pair

Question: Total number of spectral line emitted when electrons jumps from n = 5 to ground

state?

Answer: 10.00

Solution: If the electron jumps from $n_2 = 5$ to $n_1 = 1$

Then following transition possible

$$5 \rightarrow 4$$
, $5 \rightarrow 3$, $5 \rightarrow 2$, $5 \rightarrow 1$

$$4 \rightarrow 3, 4 \rightarrow 2, 4 \rightarrow 1$$

$$3 \rightarrow 3, 3 \rightarrow 1$$

$$2 \rightarrow 1$$

Hence, 10 transitions are possible

Question: Total number of acidic oxides among is/are ____

N2O, CO, N2O5, CO2, P2O5

Answer: 3.00 Solution:

CO, N2O are neutral oxide

N2O5, CO2, P2O5 are acidic oxides

