



JEE-Main-31-01-2024 (Memory Based)

[MORNING SHIFT]

Chemistry

Question: Which of the following is amphoteric?

Options:

- (a) GeO & GeO₂
- (b) SnO₂ & PbO₂
- (c) SiO₂ & GeO₂
- (d) CO & SiO

Answer: (b)

Solution: The dioxides –CO₂, SiO₂ and GeO₂ are acidic, whereas SnO₂ and PbO₂ are amphoteric in nature. Among monoxides, CO is neutral, GeO is distinctly acidic whereas SnO and PbO are amphoteric.

6 C
14 Si
32 Ge
50 Sn
82 Pb

Question: Match the following.

List - I (Reactants)	List - II (Products)
A) Glucose + HI	i) Gluconic acid
B) Glucose + NaBH ₄	ii) n-Hexane
C) Glucose + Br ₂ - H ₂ O	iii) Sorbitol
D) Glucose + HNO ₃	iv) Saccharic acid

Options:

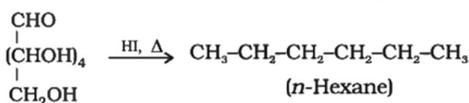
- (a) A - iii, B - ii; C - i; D - iv
- (b) A - ii, B - iii; C - i; D - iv
- (c) A - i, B - iii; C - ii; D - iv
- (d) A - ii, B - iii; C - iv; D - i

Answer: (b)

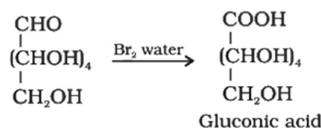
Solution:



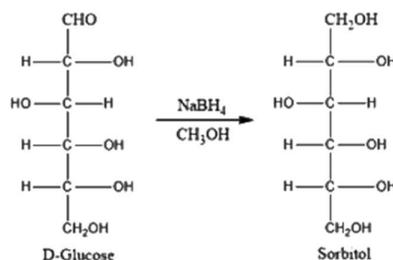
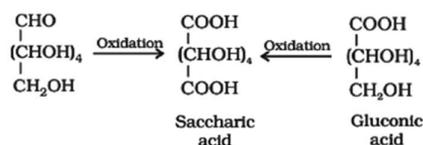
On prolonged heating with HI, it forms n-hexane, suggesting that all the six carbon atoms are linked in a straight chain.



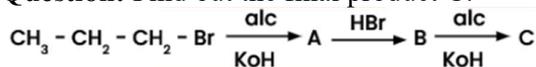
Glucose gets oxidised to six carbon carboxylic acid (gluconic acid) on reaction with a mild oxidising agent like bromine water. This indicates that the carbonyl group is present as an aldehydic group.



On oxidation with nitric acid, glucose as well as gluconic acid both yield a dicarboxylic acid, saccharic acid. This indicates the presence of a primary alcoholic (-OH) group in glucose.



Question: Find out the final product C.

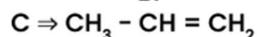
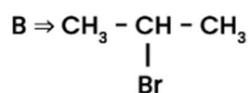
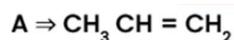


Options:

- (a) Propan - 1 - ol
- (b) Propan - 2 - ol
- (c) Propene
- (d) Propane

Answer: (c)

Solution:



Question: Which Compound is white in colour in aqueous medium?

Options:

- (a) ZnSO₄
- (b) CuSO₄
- (c) FeSO₄
- (d) FeCl₃

Answer: (a)

Solution: Zn salts are colourless due to completely filled d orbital.

Question: On which factor electrical conductivity of electrolytic cell does not depend

Options:

- (a) Concentration of electrolyte



- (b) Amount of electrolyte added
- (c) Temperature
- (d) Nature of electrode

Answer: (d)

Solution: It depends on the nature of the electrolyte and concentration of the electrolyte.

Question: Decreasing order of electron gain enthalpy of the following elements (magnitude only)

Sulphur - A, Bromine - B, Fluorine - C, Argon - D

Options:

- (a) $A > B > C > D$
- (b) $D > C > B > A$
- (c) $C > B > A > D$
- (d) $A > B > D > C$

Answer: (c)

Question: If one faraday of electricity is used in the discharging of Cu^{2+} , then find the mass (in g) of Cu deposited

Options:

- (a) 31.75 g
- (b) 45.9 g
- (c) 65.3 g
- (d) 27.5 g

Answer: (a)

Solution:



Two moles of electrons are required to deposit one mole Cu. Therefore, the weight of copper that will get deposited on passing 2 faradays of electricity is 63.5g.

$$1F = 63.5/2 \text{ g}$$

$$31.75\text{g}$$

Question: Statement I: Dichromates are generally made from cromates

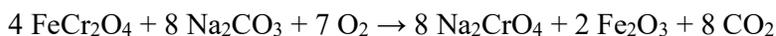
Statement II: Manganate ions are diamagnetic

Options:

- (a) Both statement I and statement II are false
- (b) Statement I is true but statement II is false
- (c) Statement I is false but statement II is true
- (d) Both statement I and statement II are true

Answer: (b)

Solution: Potassium dichromate is a very important chemical used in leather industry and as an oxidant for preparation of many azo compounds. Dichromates are generally prepared from chromate, which in turn are obtained by the fusion of chromite ore (FeCr_2O_4) with sodium or potassium carbonate in free access of air. The reaction with sodium carbonate occurs as follows:



The yellow solution of sodium chromate is filtered and acidified with sulphuric acid to give a solution from which orange sodium dichromate, $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$ can be crystallised.





Question: Which have highest electron gain enthalpy?

Options:

- (a) F
- (b) Cl
- (c) Br
- (d) I

Answer: (b)

Solution: Electron-electron repulsion is very high in fluorine which resists the addition of an electron. Thus, electron gain enthalpy follows the order: $\text{Cl} > \text{F} > \text{Br} > \text{I}$.

Question: Which of the following give positive deviation from Raoult's Law ?

Options:

- (a) Ethanol + acetone
- (b) Benzene + toluene
- (c) Acetone + chloroform
- (d) Chloroethane + bromoethane

Answer: (b)

Question: Assertion: Noble gas have very high boiling point.

Reason: Noble gas have weak dispersion forces

Options:

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Answer: (d)

Solution: Noble gases have weak Vander waals forces present in them both in the liquid and solid state. and have very low melting and boiling point due to this reason.

Question: Statement-I: Pka value of Phenol and ethanol is 10.0 and 15.9 respectively.

Statement-II: Ethanol is more Acidic than phenol.

Options:

- (a) Both statement I and statement II are false
- (b) Statement I is true but statement II is false
- (c) Statement I is false but statement II is true
- (d) Both statement I and statement II are true

Answer: (b)

Solution: Greater the pK_a value. Weaker is the acid Hence, phenol is more acidic than ethanol.

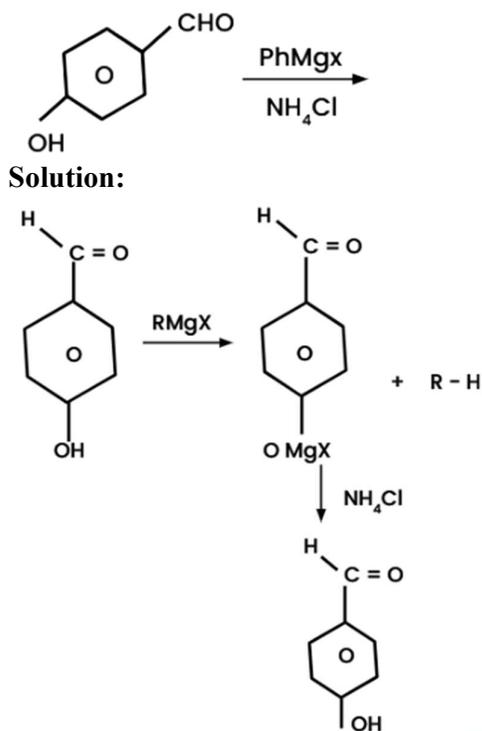
Question: Which of the following does not give colour with conc. H_2SO_4 ?

Options:

- (a) NaBr
- (b) CaF_2
- (c) NaNO_3
- (d) I

Answer: (a)

Question:



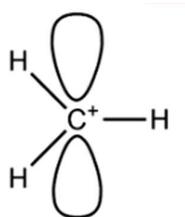
Question: Which of the following have six electron in carbon?

Options:

- (a) Carbocation
- (b) Carbanion
- (c) Carbon free radical
- (d) None of the above

Answer: (a)

Solution:



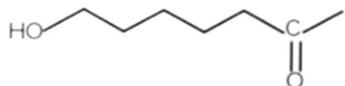
Question: Adsorption method is used in.

Options:

- (a) Chromatography
- (b) Extracational method
- (c) Distillation method
- (d) Sublimation

Answer: (a)

Question: Correct IUPAC name of



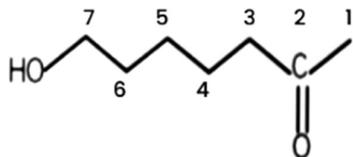
Options:



- (a) 7 - Hydroxyheptan - 2 - one
 (b) 6 - Hydroxyheptan - 2 - one
 (c) 2 - Oxoheptan - 7 - ol
 (d) 1 - Hydrogen - 6 - oxoheptane

Answer: (a)

Solution:



Question: White colour compound is

Options:

- (a) Ammonium molybdate
 (b) Ammonium sulphide
 (c) Lead sulphate
 (d) Lead iodide

Answer: (c)

Question: Statement I: Alcohols can act as nucleophile as well as electrophile

Statement II: Alcohols react with metals to form alkoxide and liberate H_2 .

Options:

- (a) Both statement I and statement II are false
 (b) Statement I is true but statement II is false
 (c) Statement I is false but statement II is true
 (d) Both statement I and statement II are true

Answer: (c)

Solution:

Statement 2 true

Statement 1 alcohol act as nucleophile and protonated alcohol act as electrophile

Question: How many of the following compounds have sp^3 hybridized central atom?

H_2O , NH_3 , SiO_2 , SO_2 , CO and BF_3

Answer: 3

Solution:



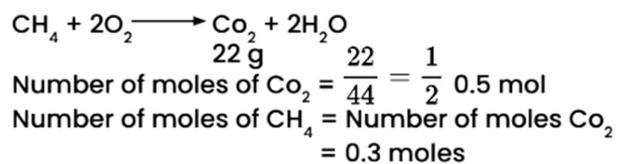
sp^3
 hybrid
 orbitals

Question: Moles of CH_4 required for formation of 22 g of CO_2 is $m \times 10^{-2}$

The value of m is :

Answer: 50

Solution:



Question: The total number of different alkanes formed when the following mixture is subjected to electrolysis :

CH_3COONa (aq) and $\text{C}_2\text{H}_5\text{COONa}$ (aq) is _____
(do not consider disproportionation reaction)

Answer: 3

Solution: Ethane, Butane & propane

Question: Which of the following are generally used in batteries?

Zn, Cd, Hg, Mn, Fe

Answer: 4

Question: Number of Geometrical Isomers of $[\text{Pt}(\text{en})_2 \text{Cl}_2]$

Answer: 2