

JEE-Main-24-06-2022-Shift-2 (Memory Based)

Chemistry

Question: Which gas is not green House gas?

Options:

- (a) H₂O vapour
- (b) O₃
- (c) N₂
- (d) CH₄

Answer: (c)

Solution: Besides carbon dioxide, other greenhouse gases are methane, water vapour, nitrous oxide, CFCs and ozone. Methane is produced.

Question: Which metal gives blue flame test?

Options:

- (a) Cesium
- (b) Lithium
- (c) Barium
- (d) Strontium

Answer: (a)

Solution: Cesium gives blue flame test.

Question: Which of the following from doesn't exist in enamel?

Options:

- (a) F⁻
- (b) Ca⁺²
- (c) P⁺³
- (d) P⁻⁵

Answer: (c)

Solution: The F⁻ ions make the enamel on teeth much harder by converting hydroxyapatite, [3(Ca₃(PO₄)₂.Ca(OH)₂], the enamel on the surface of the teeth, into much harder fluorapatite, [3(Ca₃(PO₄)₂.CaF₂).

Question: Correct order of bond order of C₂²⁻, N₂²⁻, O₂²⁻

Options:

- (a) C₂²⁻ > N₂²⁻ > O₂²⁻
- (b) N₂²⁻ > C₂²⁻ > O₂²⁻
- (c) C₂²⁻ > O₂²⁻ > N₂²⁻
- (d) O₂²⁻ > N₂²⁻ > C₂²⁻

Answer: (a)

Solution: Bond order of
C₂²⁻ = 3

$$N_2^{2-} = 2$$

$$O_2^{2-} = 1$$

Question: Which of the following has highest melting point?

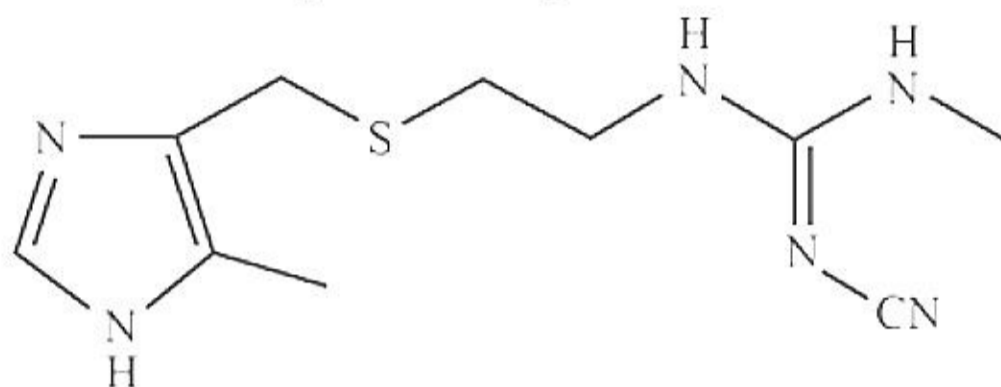
Options:

- (a) Ag
- (b) Cs
- (c) Hg
- (d) Ga

Answer: (a)

Solution: Factual

Question: Compound in the given structure is



Options:

- (a) Codeine
- (b) Morphine
- (c) Ranitidine
- (d) Cimetidine

Answer: (d)

Solution: The drug cimetidine was designed to prevent the interaction of histamine with receptors present in the stomach wall.

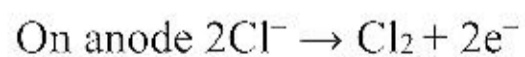
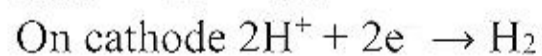
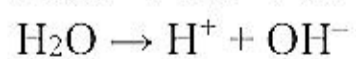
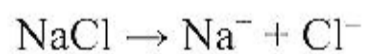
Question: H₂ gas is produced in the preparation of:

Options:

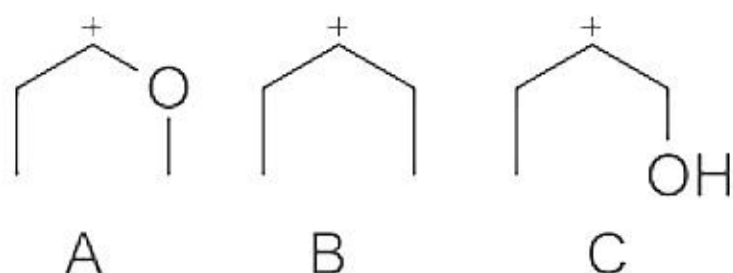
- (a) Na₂CO₃
- (b) NaOH
- (c) Na metal
- (d) NaHCO₃

Answer: (b)

Solution: NaOH is prepared by electrolysis of brine solution



Question: Compare the stability of carbocations



Options:

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

Answer: (a)

Solution: In A lone pairs of oxygen causes extra stability of carbocation through resonance

In B +I effect of two alkyl groups increase the stability of carbocation

In C -I effect of OH decreases the stability of carbocation

Question: The CFSE is maximum for:

Options:

- (a) $[\text{Mo}(\text{H}_2\text{O})_6]^{3+}$
- (b) $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$
- (c) $[\text{Mn}(\text{H}_2\text{O})_6]^{3+}$
- (d) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$

Answer: (a)

Solution: In all the given 4 compounds oxidation number of central metal atom and ligands are same. In such case CFSE depends on the electronic configuration of central metal atom.

CFSE increases as we move downwards in a group in greater extent than the increase in period from left to right.

Question: Which of these chemicals are used in fire extinguishers?

Options:

- (a) Soda ash
- (b) Caustic Soda
- (c) Baking soda
- (d) Washing soda

Answer: (c)

Solution: Sodium hydrogen carbonate is known as baking soda because it decomposes on heating to generate bubbles of carbon dioxide (leaving holes in cakes or pastries and making them light and fluffy). Sodium hydrogen carbonate is made by saturating a solution of sodium carbonate with carbon dioxide. The white crystalline powder of sodium hydrogen carbonate, being less soluble, gets separated out. $\text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{CO}_2 \rightarrow 2\text{NaHCO}_3$ Sodium hydrogen carbonate is a mild antiseptic for skin infections. it is used in fire extinguishers.

Question: What is energy of one mole of photons of wavelength 300 nm?

Options:

- (a) $3 \times 10^{-19} N_A$
- (b) $5 \times 10^{-19} N_A$

(c) $6 \times 10^{-19} N_A$

(d) $7 \times 10^{-19} N_A$

Answer: (a)

Solution:

$$E = N_A \times \frac{hc}{\lambda}$$

$$E = \frac{N_A \times 20 \times 10^{-26}}{300 \times 10^{-9}}$$

$$E = \frac{N_A \times 2 \times 10^{-25}}{3 \times 10^{-7}}$$

$$E = N_A \times 0.6 \times 10^{-18}$$

$$E = 6 \times 10^{-19} N_A$$

Question: For the equilibrium, $A(g) \rightleftharpoons B(g)$, $\Delta H = -40$ kJ/mol. The ratio of the activation energies of the forward (E_f) and reverse (E_b) reactions is $2/3$ then what is E_f

Options:

(a) 40 kJ/mol

(b) 80 kJ/mol

(c) 120 kJ/mol

(d) 60 kJ/mol

Answer: (b)

Solution:

$$\Delta H = E_f - E_b$$

$$E_f - E_b = -40$$

$$\frac{E_f}{E_b} = \frac{2}{3}$$

$$E_b = \frac{3}{2} E_f$$

$$E_f - \frac{3}{2} E_f = -40$$

$$\frac{1}{2} E_f = 40$$

$$E_f = 80 \text{ kJ/mol}$$

Question: Which of the ores have sulphide in them? (Integer based)

1. Baryte

2. Galena

3. Zinc Blende

4. Copper Pyrites

Answer: 3.00

Solution:

1. Baryte \Rightarrow $BaSO_4$

2. Galena \Rightarrow PbS

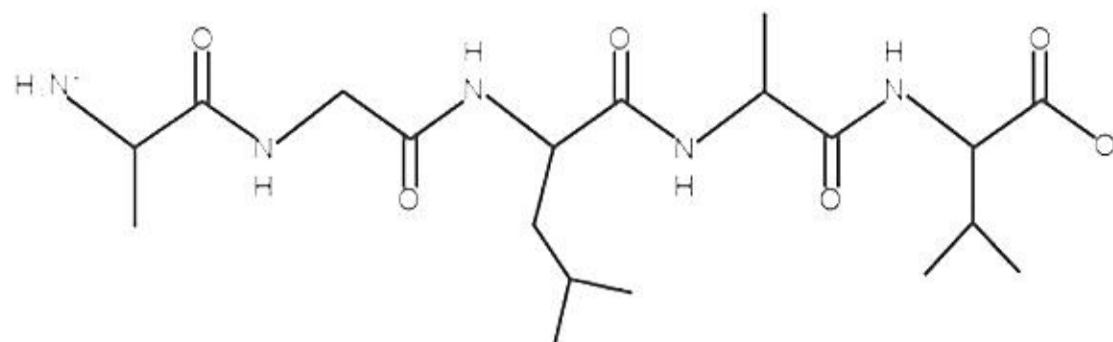
3. Zinc Blende \Rightarrow ZnS

4. Copper Pyrites \Rightarrow $CuFeS_2$

Question: Alanylglycylleucylalanylvaline. No. of peptide linkage (Integer type)

Answer: 4.00

Solution:



There are five amino acids and four peptide linkages in the given fragment

Question: Volume occupied by a 3g of gas A at 300 K is same as occupied by 0.2g of H₂ at 200K. What is molar mass of A (in g/mol).

Answer: 45.00

Solution:

$$n_1 T_1 = n_2 T_2$$

$$\frac{3}{m} \times 300 = \frac{0.2}{2} \times 200$$

$$\frac{900}{20} = m$$

$$m = 45 \text{ g/mol}$$