

JEE-Main-28-06-2022-Shift-1 (Memory Based)

Chemistry

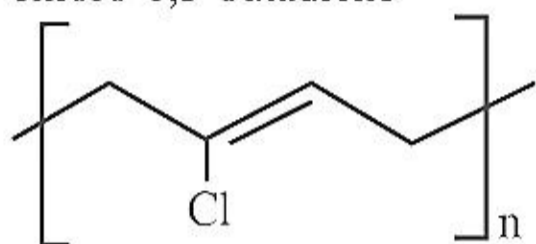
Question: Which of the following is not copolymer?

Options:

- (a) Buna S
- (b) Neoprene
- (c) PHBV
- (d) Styrene butadiene

Answer: (b)

Solution: Neoprene is a homopolymer and the monomer from which it is obtained is 2-chloro-1,3-butadiene



Neoprene

Question: Most stable Lanthanide in divalent form:

Options:

- (a) Eu^{+2}
- (b) Sm^{+2}
- (c) Yb^{+2}
- (d) Ce^{+2}

Answer: (a)

Solution: Most stable lanthanide in divalent form is Eu^{+2}

Electronic configuration of Europium is $4f^7 6s^2$.

Hence, +2 state is most stable for Eu.

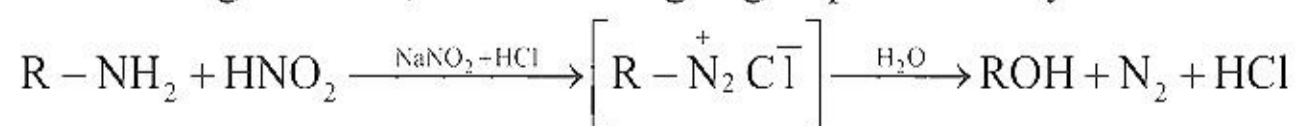
Question: Write the product formed when primary amine reacts with nitrous acid at room temperature?

Options:

- (a) Alcohol
- (b) Diazonium salt
- (c) Amide
- (d) Acid halide

Answer: (a)

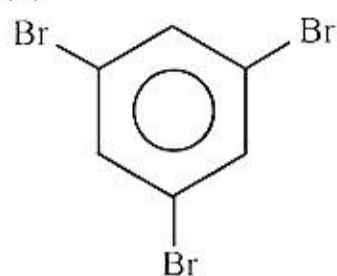
Solution: Primary aliphatic amines react with nitrous acid to form aliphatic diazonium salts which being unstable, liberate nitrogen gas quantitatively and alcohols.



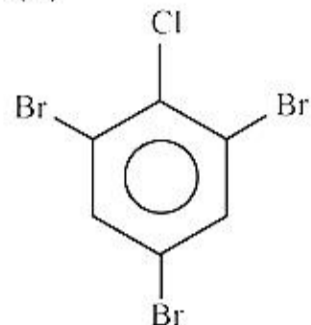
Question: Aniline on reaction with $\text{Br}_2 + \text{H}_2\text{O}$ then NaNO_2 and H_3PO_2 gives

Options:

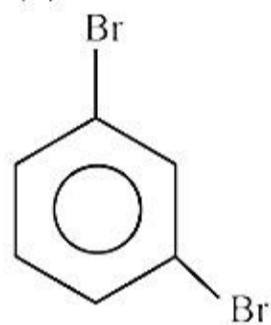
(a)



(b)



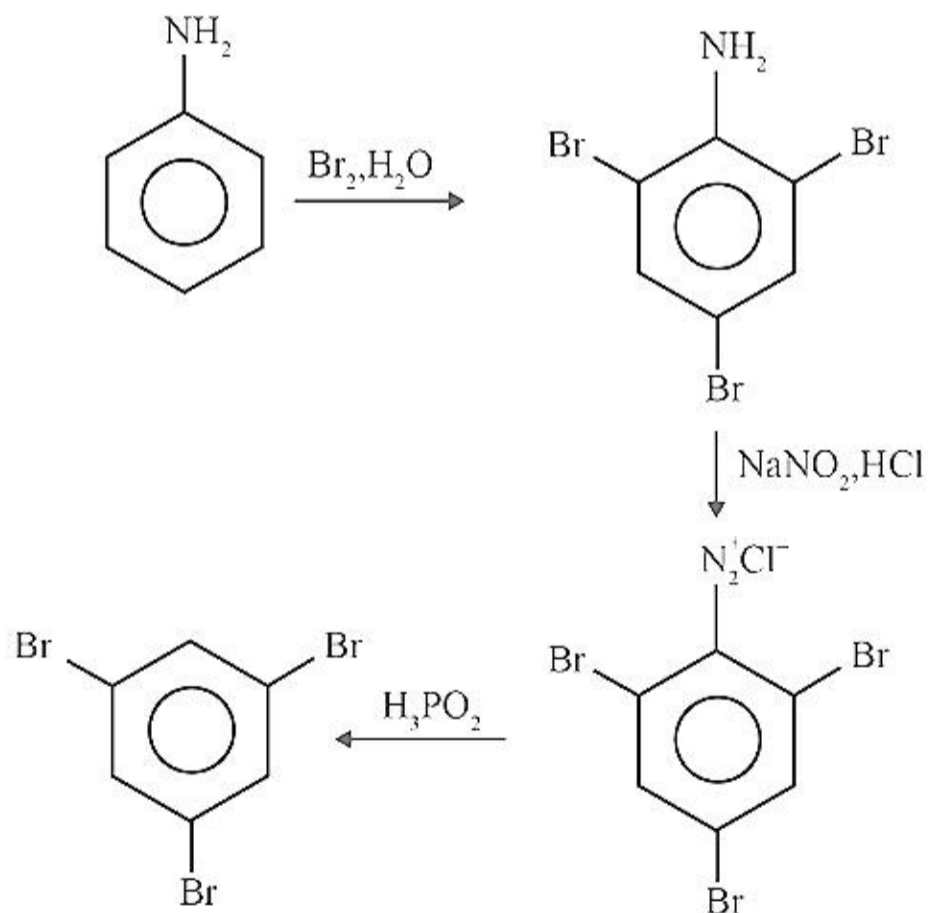
(c)



(d) None of these

Answer: (a)

Solution:



Question: The Zeta potential is property of colloidal particles for

Options:

(a) Colour

(b) Brownian movement

(c) Charge on surface of colloidal particle

(d) Tyndall effect

Answer: (c)

Solution: The potential difference between the fixed layer and the diffused layer of opposite charges is called the zeta potential or electro kinetic potential. It is used to define or explain the process of preferential adsorption of ions from solution in the electrical charge on colloidal particles.

Question: The stability of α -Helix structure of protein is due to

Options:

- (a) Hydrogen Bonding
- (b) Vander Waal's
- (c) Sulphide Linkage
- (d) None of these

Answer: (a)

Solution: Hydrogen bonding is responsible for the stability of alpha-helical structure of proteins.

Question: Hybridization of P in PF_5 is $sp^x d^y$. What is y?

Options:

- (a) 3
- (b) 2
- (c) 4
- (d) 1

Answer: (d)

Solution: Hybridization of P in PF_5 is $sp^3 d$.
Therefore $y = 1$

Question: Which of the following has minimum synergic bond?

Options:

- (a) $[Mn(CO)_5]$
- (b) $[Mn_2(CO)_{10}]$
- (c) $[Cr(CO)_6]$
- (d) $[Fe(CO)_5]$

Answer: (c)

Solution: More the number of d-electrons, higher is the synergic bonding

a) d^7 , b) d^7 , c) d^5 , d) d^8

So, (c) has minimum synergic bonding

Question: The purple colour after lassaigne test of sulphur is due to the formation of

Options:

- (a) $Na_4[Fe(CN)_6S]$
- (b) $Na_4[Fe(CN)_5NCS]$
- (c) $Na_4[Fe(CN)_5NOS]$
- (d) $Na_2[Fe(CN)_5NCS]$

Answer: (c)

Solution: $Na_2S + Na_2[Fe(CN)_5NO] \rightarrow Na_4[Fe(CN)_5NOS]$

Sodium sulphide reacts with sodium nitroprusside to form a violet colour compound, which confirms the presence of sulphur.

Question: If work function of a metal is 6.63×10^{-19} J. Find minimum wavelength of light required to emit photoelectron.

Options:

- (a) 100 nm
- (b) 200 nm
- (c) 300 nm
- (d) 400 nm

Answer: (c)

Solution:

$$K_{\max} = 0, \phi = \frac{hc}{\lambda}$$
$$\lambda = \frac{hc}{\phi} = \frac{6.63 \times 10^{-34} \times 3 \times 10^8}{6.63 \times 10^{-19}} = 300 \text{ nm}$$

Question: Which of the following gives N_2 on thermal decomposition?

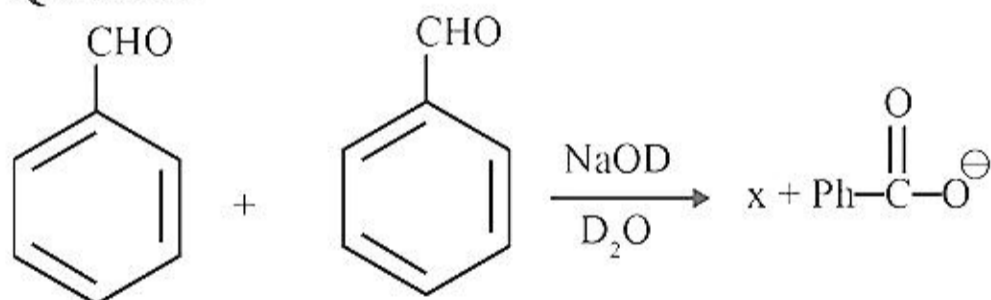
Options:

- (a) $B_2(NO)_3$
- (b) $Ba(N_3)_2$
- (c) $NaNO_3$
- (d) HNO_3

Answer: (b)

Solution: $Ba(N_3)_2 \rightarrow Ba + 3N_2$

Question:



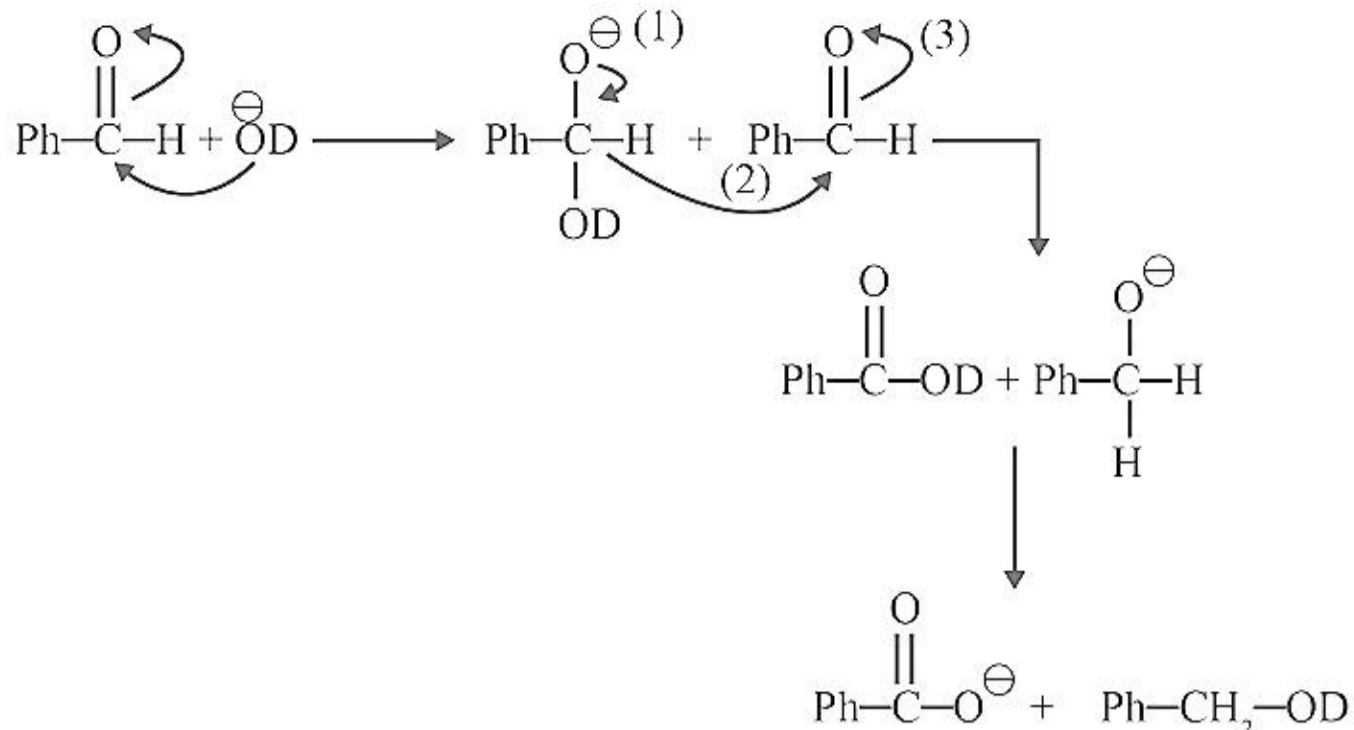
x is

Options:

- (a) $Ph-CH_2-OD$
- (b) $Ph-COOD$
- (c) $Ph-CHO$
- (d) None

Answer: (a)

Solution:



Question: $\text{H}_2 + \text{CuO} \rightarrow \text{Product}$

Options:

- (a) Cu
- (b) CuO_2
- (c) Cu_2O
- (d) None

Answer: (a)

Solution: $\text{H}_2 + \text{CuO} \rightarrow \text{Cu} + \text{H}_2\text{O}$

Question: Find the valence shell electronic configuration of the element present above of element E of group 16 and Period -4

Options:

- (a) $2s^2 2p^6$
- (b) $2s^2 2p^5$
- (c) $3s^2 3p^4$
- (d) $3s^2 3p^3$

Answer: (c)

Solution: E selenium (Se)

Element present above Se is sulphur. Valence shell electronic configuration of sulphur is $[\text{Ne}]3s^2 3p^4$

Question: Calculate the amount of electricity needed to convert $\text{Cr}_2\text{O}_7^{2-}$ to Cr^{3+}

Options:

- (a) 289500 C
- (b) 579000 C
- (c) 5790 C
- (d) 28950 C

Answer: (b)

Solution: $\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 6\text{e}^- \rightarrow 2\text{Cr}^{3+} + 8\text{H}_2\text{O}$

From balanced equation, we get $n = 6$

Charge required = $nF = 6 \times 96500 \text{ C} = 579000 \text{ C}$

Question: Find heat absorbed for an isothermal process in vacuum

[Given: $V_1 = 4\text{L}$, $V_2 = 10\text{L}$]

Options:

- (a) 0
- (b) 1
- (c) 2
- (d) 3

Answer: (a)

Solution: For an isothermal process in vacuum

$$dU = 0$$

$$dW = 0$$

$$dU = dq + dW$$

$$\therefore dq = 0$$

Question: Assertion: For Group 15 elements, the acidity of pentavalent oxide of is greater than trivalent oxide.

Reason: Down the group acidity Decreases.

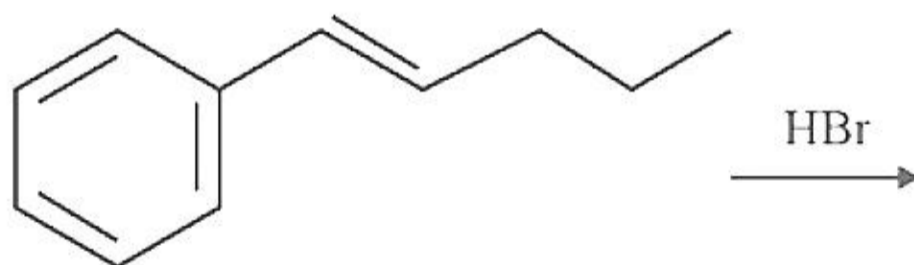
Options:

- (a) Both assertion and reason are true, reason is correct explanation of assertion.
- (b) Both assertion and reason are true, but reason is not a correct explanation of assertion.
- (c) Assertion is true, but reason is false
- (d) Assertion is false, but reason is true

Answer: (b)

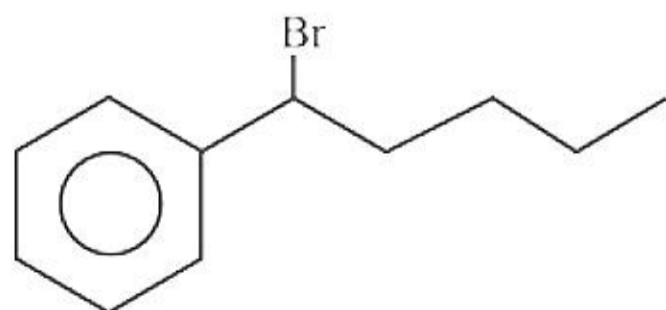
Solution: The oxide in the higher oxidation state of the element is more acidic than that of lower oxidation state. Their acidic character decreases down the group. The oxides of the type E_2O_3 of nitrogen and phosphorus are purely acidic, that of arsenic and antimony amphoteric and those of bismuth predominantly basic.

Question:

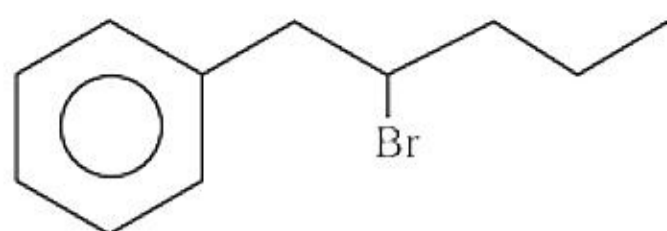


Options:

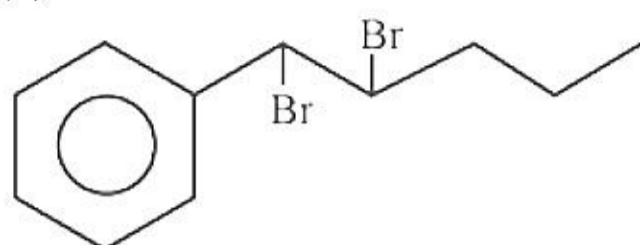
(a)



(b)



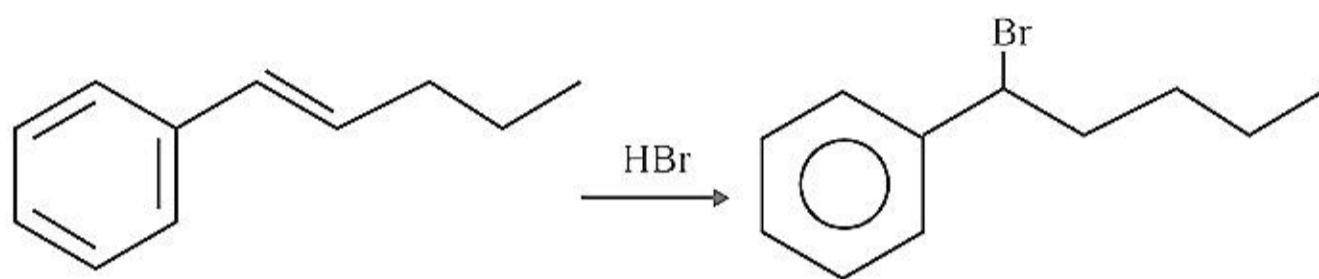
(c)



(d) None

Answer: (a)

Solution:



Question: Statement-1: $[\text{Ni}(\text{CN})_6]^{4-}$ is square planar d^2sp^3 and diamagnetic, whereas $\text{Ni}(\text{CO})_4$ is square planar and sp^3 hybridised and paramagnetic.

Statement-2: NiCl_4^{2-} and NiCO_4 has the same d configuration, geometry and hybridization.

Options:

- (a) Statement 1 and statement 2 both are correct.
- (b) Statement 1 is correct but statement 2 is wrong.
- (c) Statement 1 is wrong but statement 2 is correct.
- (d) Statement 1 and statement 2 both are wrong.

Answer: (d)

Solution: $[\text{Ni}(\text{CN})_6]^{4-}$ is paramagnetic and sp^3d^2 , octahedral

$\text{Ni}(\text{CO})_4$ is tetrahedral, dsp^2 hybridized and diamagnetic

NiCl_4^{2-} is square planar, sp^3 hybridised and paramagnetic

Therefore, both the statements 1 and 2 are false

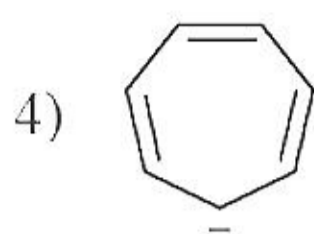
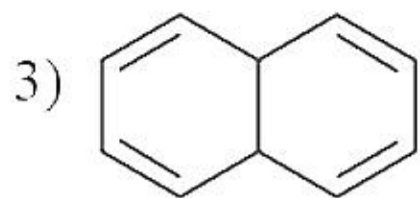
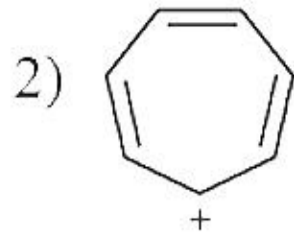
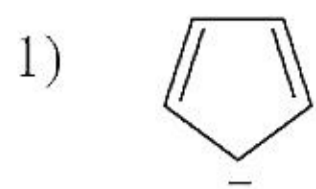
Question: 0.5 g of bromine organic compound gives 0.40g of AgBr, what is percent of bromine present in organic compound?

Answer: 34.00

Solution:

$$\begin{aligned} \% \text{ of Br} &= \frac{80}{188} \times \frac{\text{Mass of AgBr} \times 100}{\text{Mass of compound}} \\ &= \frac{80}{188} \times \frac{0.4 \times 100}{0.5} = 34\% \end{aligned}$$

Question: How many are aromatic compounds?



Answer: 2.00

Solution: Both 1 & 2 are cyclic, planar and follows Huckel's rule