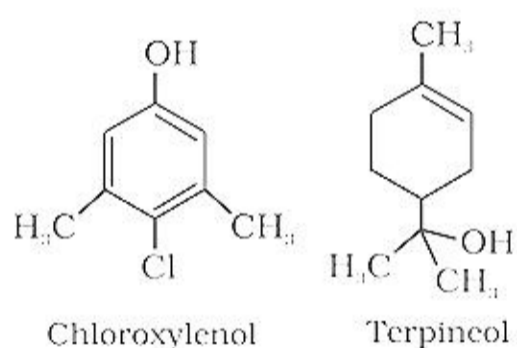# Chemistry

Question: Dettol has 2 structure one has 6 and other has 2 pi electrons. What is name of structure with 2 pi electrons?

Options:

(a) Chloroxylenol

(b) Terpineol

(c) Bithionol

(d) Salvarsan

Answer: (b)

Solution: Dettol is a mixture of chloroxylenol and terpineol. Chloroxylenol has 6 pi electrons and terpineol has 2 pi electrons

Chloroxylenol   Terpineol

Question: Assertion: Water with BOD value 17 is considered polluted

Reason: The amount of oxygen required by the bacteria to break down the inorganic and organic matter in certain volume of water
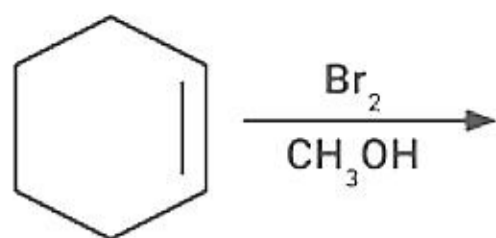
Options:

(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 the assertion.

(c) Assertion is true, but reason is false.

(d) Assertion is false, but reason is true.
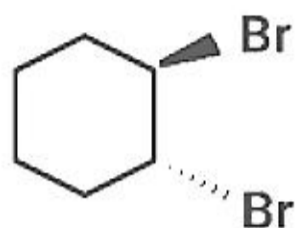
Answer: (c)

Solution: The amount of oxygen required by bacteria to break down the organic matter present in a certain volume of a sample of water, is called Biochemical Oxygen Demand (BOD). Highly polluted water could have a BOD value of 17 ppm or more.
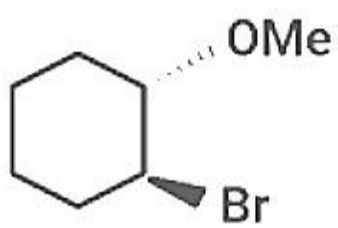
Question:

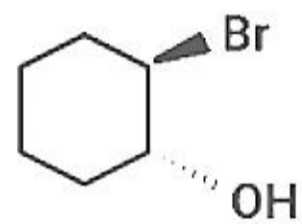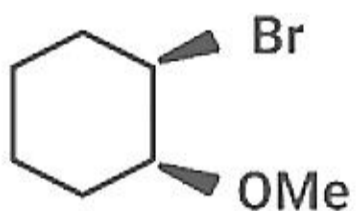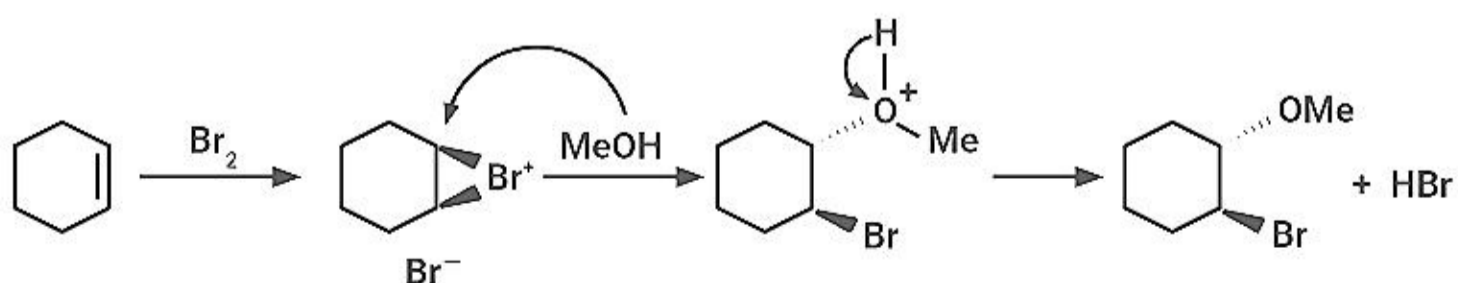**Options:**

(a)

(b)

(c)
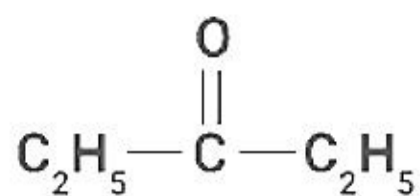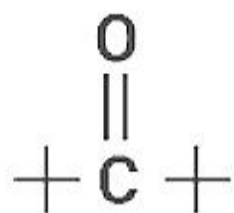

(d)

Answer: (b)

Solution:

Question: Which of following does not give enamine on reaction with 2° amine?

Options:

(a)

$$C_2H_5 - \overset{\overset{\displaystyle O}{\displaystyle \|}}{C} - C_2H_5$$

(b)

$$+ \overset{\overset{\displaystyle O}{\displaystyle \|}}{C} +$$
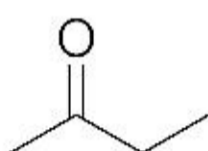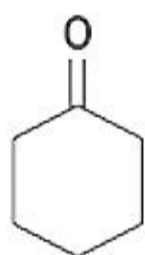
(c)

(d)

Answer: (b)

Solution: Due to absence of alpha hydrogens in this molecule, it will not form enamine on reaction with $2°$ amine.

Question: Assertion: The amphoteric behavior of H_2O is explained by Lewis's acid base theory

Reason: H_2O acts as acid with NH_3 and base with H_2S

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 the assertion.

(c) Assertion is true, but reason is false.

(d) Assertion is false, but reason is true.

Answer: (d)

Solution: The amphoteric behavior of H_2O is explained by Bronsted acid base theory and H_2O acts as acid with NH_3 & as a base with H_2S

Question: Which of the following has the least spin only magnetic moment?

Options:

(a) Fe^{3+}

(b) Fe^{2+}

(c) Cu^{2+}

(d) Ni^{2+}

Answer: (c)

Solution: The ion having least number of unpaired electrons will have least spin only magnetic moment. Fe^{3+} has 5 unpaired electrons, Fe^{2+} has 4 unpaired electrons, Cu^{2+} has 1 and Ni^{2+} has 2 unpaired electrons.

Question: What is the correct order of electron gain enthalpy of Cl, F, Te, Po

Options:

(a) Cl > F > Te > Po

(b) F > Cl > Te > Po

(c) F < Cl < Te < Po

(d) Cl < F < Te < Po

Answer: (a)

Solution:

Electron gain enthalpy

F $\Rightarrow$ −333

Cl $\Rightarrow$ −349

Te $\Rightarrow$ −190

Po $\Rightarrow$ −174

Cl > F > Te > Po

Question: Order of reduction potential of Cl_2, I_2, Ag^+, Na^+, Li^+

Options:

(a) Cl_2 > Li^+ > I_2 > Na^+ > Ag^+

(b) I_2 > Li^+ > Cl_2 > Na^+ > Ag^+

(c) $Na^+ > Li^+ > I_2 > Ag^+ > Cl_2$

(d) $Cl_2 > Ag^+ > I_2 > Na^+ > Li^+$

Answer: (d)

Solution:

Question: Heat of combustion of benzene and acetylene is given as ΔH_1, and ΔH_2, What is the expression for ΔH when acetylene is isomerized to benzene
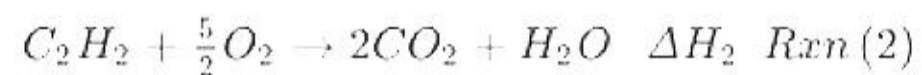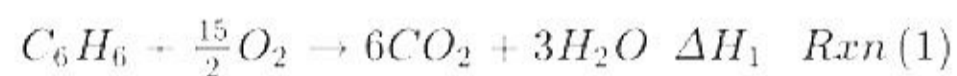
Options:

(a) $\Delta H_2 - \Delta H_1$

(b) $3\Delta H_2 - \Delta H_1$

(c) $\Delta H_2 - 3\Delta H_1$

(d) $3\Delta H_2 + \Delta H_1$

Answer: (b)

Solution:

$$C_6H_6 + \frac{15}{2}O_2 \rightarrow 6CO_2 + 3H_2O \quad \Delta H_1 \quad Rxn\,(1)$$
$$C_2H_2 + \frac{5}{2}O_2 \rightarrow 2CO_2 + H_2O \quad \Delta H_2 \quad Rxn\,(2)$$
$$\overline{3C_2H_2 \rightarrow C_6H_6 \quad \Delta H_3 \quad\quad Rxn\,(3)}$$
$$(3) = 3 \times (2) - (1)$$
$$\therefore \Delta H_3 = 3.(\Delta H_2) - \Delta H_1$$

Question: Given K_{sp} of Bi_2S_3. What is formula for S?

Options:

(a) $\left(\dfrac{K_{sp}}{4}\right)^{\frac{1}{2}}$

(b) $\left(\dfrac{K_{sp}}{27}\right)^{\frac{1}{3}}$

(c) $\left(K_{sp}\right)^{\frac{1}{5}}$

(d) $\left(\dfrac{K_{sp}}{108}\right)^{\frac{1}{5}}$

Answer: (d)

Solution:

Question: Why sodium extract of Halide is boiled with HNO_3 before testing for halogen?

Options:

(a) To remove other ions which may interfere in the test

(b) To make solution acidic

(c) To remove turbidity

(d) To convert Fe^{2+} to Fe^{3+}

Answer: (a)

Solution: If nitrogen or sulphur is also present in the compound, the sodium fusion extract is first boiled with concentrated nitric acid to decompose cyanide or sulphide of sodium formed during Lassaigne's test. These ions would otherwise interfere with silver nitrate test for halogens.

Question: Compare Debroglie Wavelength of proton, neutron, electron and alpha particle

Options:

(a) $\lambda_\alpha < \lambda_p \simeq \lambda_n < \lambda_e$

(b) $\lambda_e < \lambda_n \simeq \lambda_p < \lambda_\alpha$

(c) $\lambda_p < \lambda_n \simeq \lambda_\alpha < \lambda_e$

(d) $\lambda_n < \lambda_p \simeq \lambda_e < \lambda_\alpha$
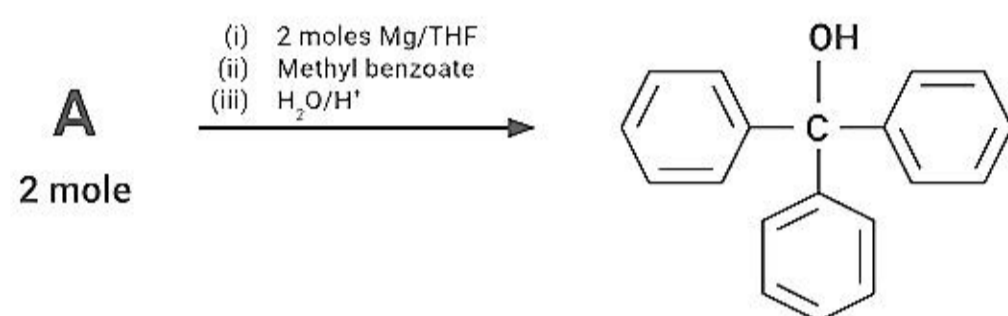
Answer: (a)

Solution:

$$\lambda = \frac{h}{mv}$$

Proton, neutron, Electron, α – particle

$m_{\alpha-\text{particle}} > m_p \simeq n_n > m_e$

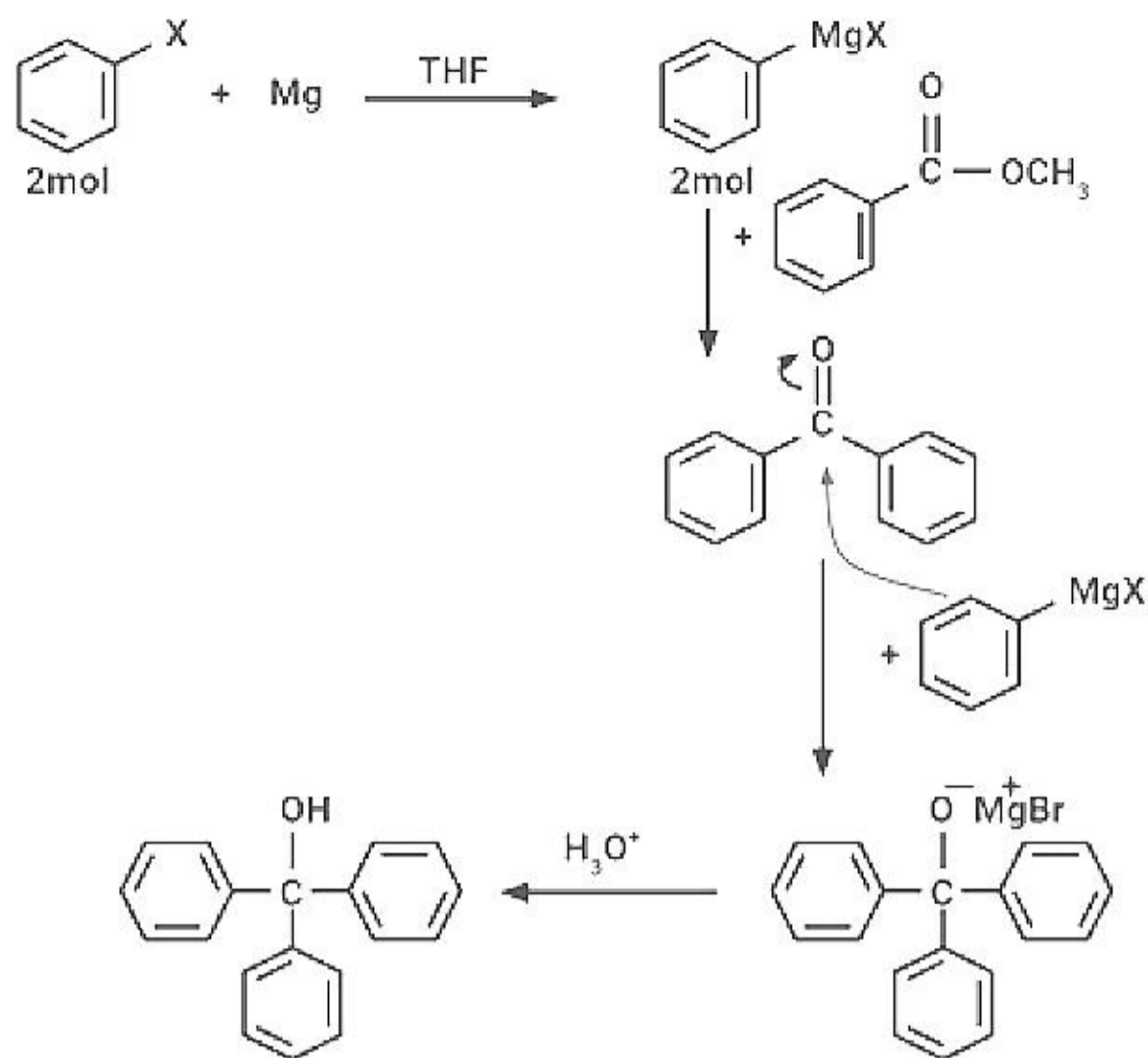$\lambda_{\alpha-\text{particle}} < \lambda_p \simeq \lambda_n < \lambda_e$

Question:

What is A?

Options:

(a) Bromobenzene

(b) Benzylbromide

(c) Diphenylbromide

(d) Methylbromide

Answer: (a)

Solution:

Question: The minimum energy needed to eject an electron from Pt where threshold frequency was given

Options:

(a) Work function

(b) Kinetic energy

(c) Atomic energy

(d) Mechanical energy

Answer: (a)

Solution:

w_o (minimum energy to eject electron is work function) = $h\nu_o$ (Threshold frequency)

$h = 6.6 \times 10^{-34}$ J/s

Question: Which of the following give biuret test?

Options:

(a) Glycine

(b) Alanine

(c) both (a) and (b)

(d) None of these

Answer: (d)

Solution: The name of the test comes from the name of the compound, biuret, which gives this test. The reaction is not absolutely specific for peptide bond because many compounds containing two carbonyl groups linked through nitrogen or carbon atoms give a positive result.

Question: $PCl_5 + H_2O \rightarrow A + HCl$

$A + 3H_2O \rightarrow B + HCl$

Find the number of ionizable hydrogen in B

Answer: 3.00

Solution:

$PCl_5 + H_2O \rightarrow POCl_3 + HCl$

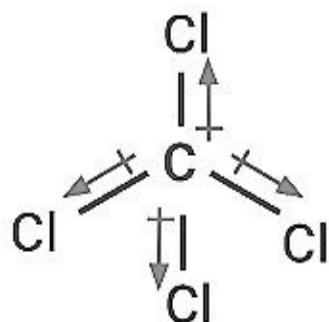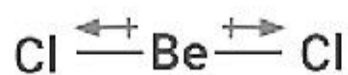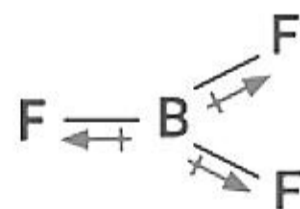$POCl_3 + H_2O \rightarrow H_3PO_4 + HCl$
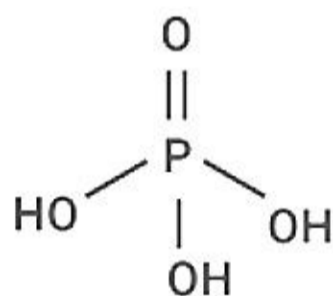
Question: How many of the following species have zero dipole moment?

BF_3, $BeCl_2$, NH_3, H_2O, CCl_4, HCl
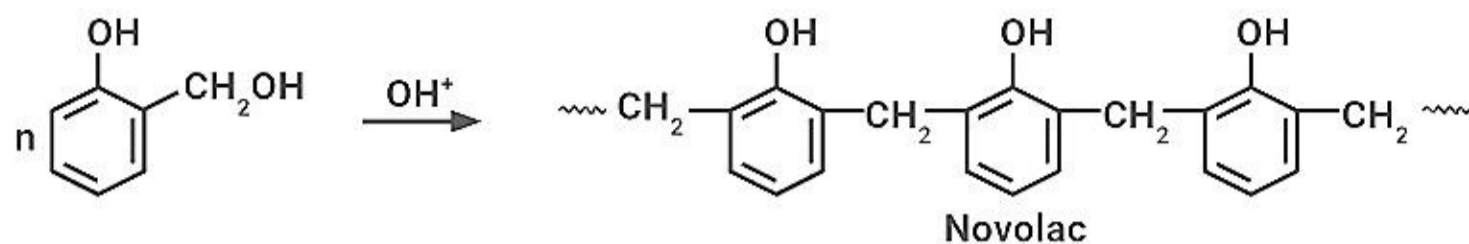
Answer: 3.00

Solution: BF_3, $BeCl_2$, CCl_4

Question: Novalac has molar mass 393. Find no of monomers in it.
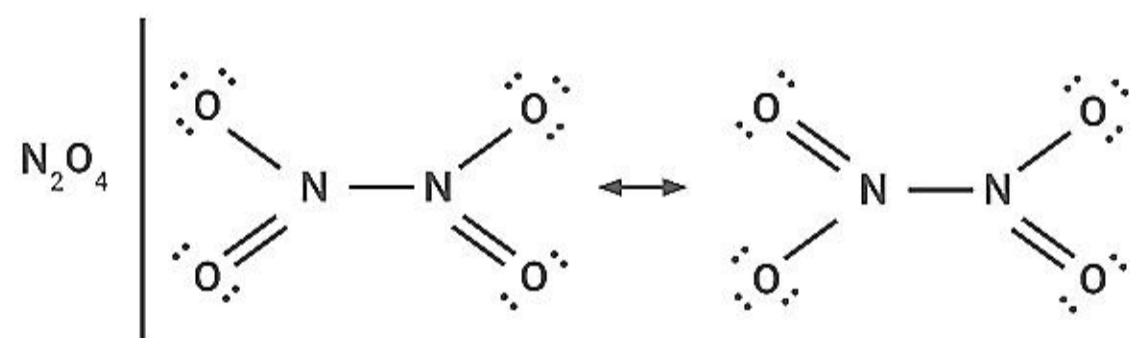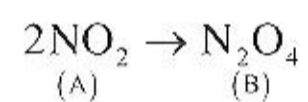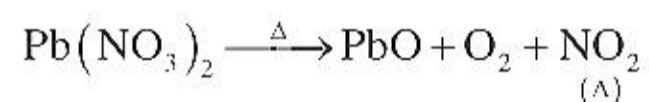
Answer: 3.00

Solution:

Novolac

Question: Lead nitrate on heating gives PbO, O_2 and an unknown gas A which dimerises to form B. Find number of bridged O atoms in B

Answer: 0.00

Solution:

$$Pb\left(NO_3\right)_2 \xrightarrow{\Delta} PbO + O_2 + \underset{(A)}{NO_2}$$

$$\underset{(A)}{2NO_2} \rightarrow \underset{(B)}{N_2O_4}$$

Number of bridged oxygen atoms in N_2O_4 is 0 (zero)