

	Section-A	
Q.1.	The transparent soaps are prepared by dissolving the soap in ___ Ethanol ___ # Glycerol # Ethanol # Propanol # Ethylene glycol	(1)
Q.2	An example of ambident nucleophile is _____ NO₂⁻ _____ # OH ⁻ # NH ₃ # NO ₂ ⁻ # OR ⁻	(1)
Q.3.	<p>Draw a neat labelled diagram showing magnetic separation process of concentration of an ore.</p> <div style="text-align: center;"> </div>	(1)
Q.4.	<p>Answer the following</p> <p>1. A FCC lattice cube is formed by atoms A and B .if atom A is present at the corner of the cube and the atom B at the faces of the cube. Find out the formula of the compound?</p> <p>Ans.</p> <p style="text-align: right;">$\frac{1}{8} \times 8 = 1 \text{ atom}$</p> <p>Contribution of atom A at eight corners of the cube = $\frac{1}{8}$</p> <p>Contribution of atom at each face = $\frac{1}{2}$ atom</p> <p style="text-align: right;">$\frac{1}{2} \times 6 = 3 \text{ atoms}$</p> <p>Contribution of atom B at six faces of the cube = $\frac{1}{2}$</p> <p>Formula of the compound = AB₃</p> <p style="text-align: center;">OR</p> <p style="text-align: center;">LiCl in excess of Li is pink in colour. Give reason</p> <p>Ans.</p> <p>When crystals of LiCl are heated in an atmosphere of Li vapour, the Lithium atoms are deposited on the surface of the crystal. The Cl-ions diffuse to the surface of the crystal and combine with Li atoms to give LiCl. This happens by loss of electron by Lithium atoms to form Li⁺ ions. The released electrons diffuse into the crystal and occupy anionic sites. As a result the crystal now has an excess of Lithium. The anionic sites occupied by unpaired electrons are called <i>F-centres</i> (from the German word <i>Farbenzenter</i> for colour centre). They impart Pink colour to the crystals of LiCl.</p>	(1)

Section-B		
Q.5.	<p>Answer the following.</p> <p>1. Write a point of difference between Antiseptic and Disinfectant Ans-Drugs that are produced from micro-organisms and are used to kill other harmful micro-organisms are known as Antibiotics. Disinfectants are chemical substances which kill micro-organisms but are not safe to be applied on living tissues. These are used to kill the micro-organisms present in the drains, toilets etc.</p> <p>2. Give one example of Tranquilizer and artificial sweetening agent Tranquilizer = Seconal/ Reserpine and artificial sweetening agent=Aspartame</p>	(2)
Q.6.	<p>With reference to the following graph label A and B</p> <div style="text-align: center;"> <p><i>Effect of catalyst on activation energy</i></p> </div> <p>Write the units for (i) rate of reaction= mol L⁻¹ s⁻¹ (ii) rate constant of second order reaction= mol⁻¹ L s⁻¹</p>	(2)
Q.7.	<p>Answer the following.</p> <p>a) Write a chemical equations involved in refining of Zirconium by Van Arkel method.</p> $\text{Zr} + 2\text{I}_2 \longrightarrow \text{ZrI}_4$ $\text{ZrI}_4 \longrightarrow \text{Zr} + 2\text{I}_2$ <p>b) What are the conditions that are necessary for vapour phase refining?</p> <p>ANS The conditions necessary for vapour phase refining are:</p> <p>i) The metal should form a volatile compound with an available reagent. ii) The volatile compound should decompose easily so that it is recovered easily.</p>	(2)
Section-C		
Q.8.	<p>Derive integrated rate equation for the following zero order reaction</p> $\text{R} \longrightarrow \text{P}$	(3)

$$\text{Rate} = -\frac{d[R]}{dt} = k[R]^0$$

As any quantity raised to power zero is unity

$$\text{Rate} = -\frac{d[R]}{dt} = k \times 1$$

$$d[R] = -k dt$$

Integrating both sides

$$[R] = -k t + I \quad (4.5)$$

where, I is the constant of integration.

At $t = 0$, the concentration of the reactant $R = [R]_0$, where $[R]_0$ is initial concentration of the reactant.

Substituting in equation (4.5)

$$[R]_0 = -k \times 0 + I$$

$$[R]_0 = I$$

Substituting the value of I in the equation (4.5)

$$[R] = -kt + [R]_0 \quad (4.6)$$

Calculate activation energy of particular reaction whose rate triples when temperature changes from 50°C to 100°C .

($R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$)

Solution: Formula

$$\log \frac{k_2}{k_1} = \frac{E_a}{2.303R} \left[\frac{1}{T_1} - \frac{1}{T_2} \right]$$

$$\log \frac{k_2}{k_1} = \frac{E_a}{2.303R} \left[\frac{T_2 - T_1}{T_1 T_2} \right]$$

$$\text{Log } 3 = E_a / 2.303 \times 8.314 \left[\frac{373 - 323}{323 \times 373} \right]$$

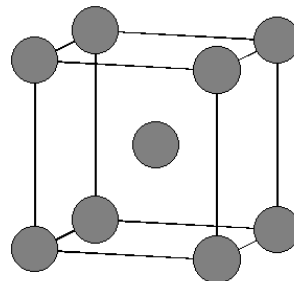
$$E_a = \frac{0.4771 \times 2.303 \times 8.314 \times 323 \times 373}{50}$$

$$E_a = 22011.76 \text{ J} = \mathbf{22.01176 \text{ KJ}}$$

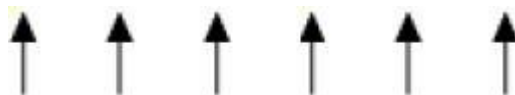
Q.9.

Answer the following.

a) Draw a Body centred cubic unit cell

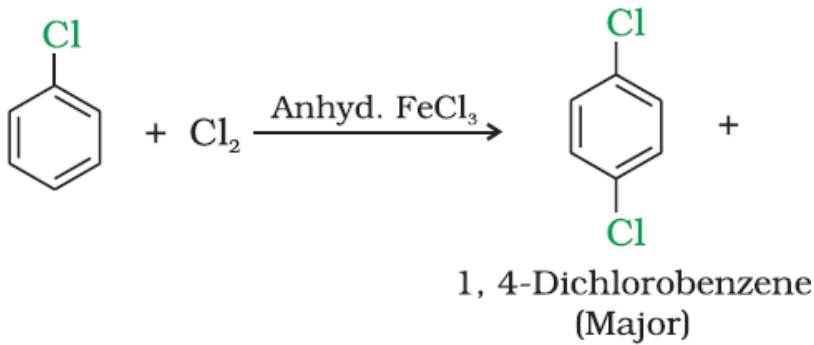


b) What type of magnetism is shown in the following alignment of magnetic moments?

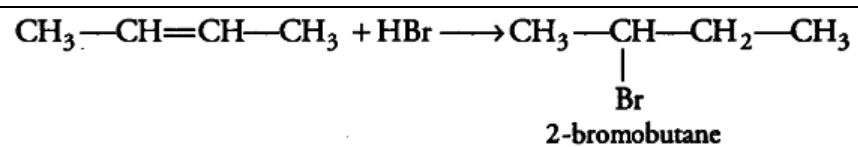


Ferromagnetism

(3)



d) But-2-ene to 2-bromobutane



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