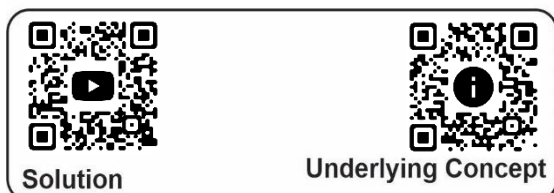# CONCEPT STRENGTHENING SHEET
CSS-01
CHEMISTRY

AIATS-01 (CF + OYM), Q.60
Topic: Ideal Solutions

An ideal solution is made by mixing A and B. If vapour pressure of component A in the solution is 200 torr. Then molar ratio of A and B in vapour phase is

$$\left(P_A^\circ = 400\,torr, P_B^\circ = 100\,torr\right)$$

(1) 1 : 1   (2) 2 : 1

(3) 1 : 4   (4) 4 : 1

Scan/Click

Solution   Underlying Concept

Practice Questions:

1. The vapour pressure of two liquids P and Q are 80 torr and 60 torr respectively. The total vapour pressure obtained by mixing 1 mole of P and 4 moles of Q would be

   (1) 140 torr   (2) 64 torr

   (3) 76 torr   (4) 80 torr

2. Two components A and B form an ideal solution. The mole fractions of A and B in ideal solution are x_A and x_B, while the vapour pressure of A and B component in pure state are P_A° and P_B° respectively. Mole fraction of component A in vapour phase $\left(y_A\right)$ is

   (1) $\dfrac{P_A^\circ X_A}{P_A^\circ X_A + P_B^\circ X_B}$ (2) $\dfrac{P_A^\circ}{P_A^\circ X_A + P_B^\circ X_B}$

   (3) $\dfrac{P_B^\circ X_A}{P_A^\circ X_A + P_B^\circ X_B}$ (4) $\dfrac{P_A^\circ X_B}{P_A^\circ X_A + P_B^\circ X_B}$

3. Equal moles of A and B are mixed and the vapour pressure of A and B in pure state are 500 and 300 mm Hg respectively. The mole fraction of A in vapour state is

   (1) 0.52   (2) 0.32

   (3) 0.47   (4) 0.62

4. An Ideal solution is made by mixing X and Y. If vapour pressure of component X in the solution is 100 torr, then mole fraction of Y in vapour phase is

   $$\left(P_x^\circ = 300\ torr, P_Y^\circ = 150\ torr\right)$$
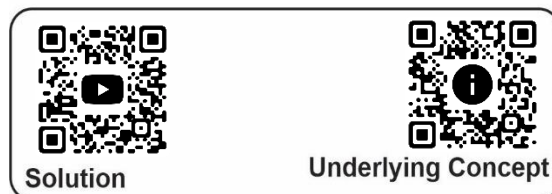
   (1) 0.5   (2) 0.4

   (3) 0.3   (4) 0.8

AIATS-01 (CF + OYM), Q.69
Topic: Product of Electrolysis

On electrolysis of aqueous solution of $AgNO_3$ using silver electrodes, the product obtained at anode will be

(1) O_2 (2) Ag^+

(3) Ag   (4) NO_2

Scan/Click

Solution   Underlying Concept

Practice Questions:

1. When dilute HNO_3 is electrolysed
   (1) O_2 gas is formed at anode
   (2) H_2 gas is formed at anode
   (3) NO_2 is formed at anode
   (4) N_2 gas is formed at anode

2. On electrolysis of aqueous solution of NaCl using platinum electrodes, the product obtained at cathode will be
   (1) $O_2(g)$ (2) $H_2(g)$
   (3) $Cl_2(g)$ (4) $Na(s)$

3. The number of Faradays required to deposit 27 g of aluminium (Atomic weight of Al. 27) from molten $AlCl_3$
   (1) 1F   (2) 2F
   (3) 3F   (4) 4F

4. Electrolysis of molten anhydrous calcium chloride produce
   (1) $H_2(g)$ at cathode   (2) $Cl_2(g)$ at cathode
   (3) $Ca(s)$ at anode   (4) $Ca(s)$ at cathode

AIATS-01 (CF + OYM), Q.67
Topic: Elevation Boiling Point

Maximum value of ebullioscopic constant is for
(1) 0.1 M aq CH_3COOH
(2) 0.2 M aq urea
(3) 0.1 M aq NaCl
(4) All have same values

Scan/Click

Solution   Underlying Concept
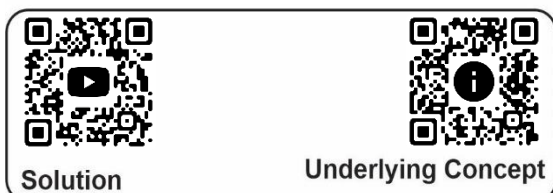
Practice Questions:

1. Value of ebullioscopic constant depends upon
   (1) $\Delta H_{solution}$
   (2) Nature of solvent
   (3) Nature of solute
   (4) Freezing point of solution

2. Minimum value of ebullioscopic constant is for
   (1) 0.1 M aq CH_3COOH
   (2) 0.2 M aq urea
   (3) 0.1 M aq NaCl
   (4) All have same values

3. At higher altitude, the boiling point of water is lowered because
   (1) Atmospheric pressure is low
   (2) Temperature is low
   (3) Atmospheric pressure increases
   (4) Water solidifies to ice

AIATS-01 (CF + OYM), Q.76
Topic: Variation of Molar Conductivity with Concentration

**Statement I:** Molar conductivity increases slowly on dilution for strong electrolyte.

Statement II: Conductivity decreases on dilution for weak electrolyte.

In the light of above statements, choose the correct option below.
(1) Statement I is correct and statement II is incorrect
(2) Statement I is incorrect and statement II is correct

(3) Both statement I and statement II are correct
(4) Both statement I and statement II are incorrect

Scan/Click

Solution   Underlying Concept
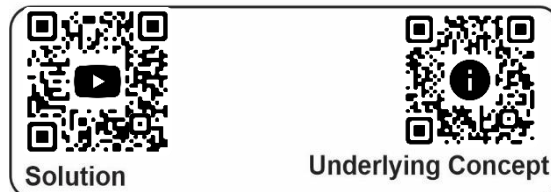
Practice Questions:

1. Limiting molar conductivity of CH_3COOH $\left(\Lambda_m^0\left(CH_3COOH\right)\right)$ is equal to

   (1) $\Lambda_m^0\left(CH_3COONa\right) + \Lambda_m^0\left(HCl\right) - \Lambda_m^0 NaCl$

   (2) $\Lambda_m^0\left(CH_3COONa\right) + \Lambda_m^0\left(NaCl\right) - \Lambda_m^0\left(HCl\right)$

   (3) $\Lambda_m^0\left(HCl\right) + \Lambda_m^0\left(NaCl\right) - \Lambda_m^0\left(CH_3COONa\right)$

   (4) $\Lambda_m^0\left(NaOH\right) + \Lambda_m^0\left(CH_3COOH\right) - \Lambda_m^0\left(NaCl\right)$

2. The conductivity of 0.1 M solution of KCl at 298 K is 0.025 Scm^{-1}. What would be its molar conductivity?
   (1) 25 $Scm^2\ mol^{-1}$ (2) 250 $Scm^2\ mol^{-1}$
   (3) 2.5 $Scm^2\ mol^{-1}$ (4) 0.25 $scm^2\ mol^{-1}$

3. Which of the following is not correct?
   (1) Molar conductance of a solution increase with dilution
   (2) Equivalent conductance increases with dilution
   (3) Conductivity increases with dilution
   (4) At infinite dilution each ion plays a definite role towards electrical conductance

## AIATS-01 (CF + OYM), Q.57
Topic: Properties of Solid

Statement I: Ferrimagnetic substance becomes paramagnetic on heating.
Statement II: Diamagnetic substances are weakly magnetised in a magnetic field in opposite direction.
In the light of above statements choose the **correct** option.
(1) Statement I is correct and statement II is incorrect
(2) Statement I is incorrect and statement II is correct
(3) Both statement I and statement II are correct
(4) Both statement I and statement II are incorrect

Scan/Click

Solution   Underlying Concept
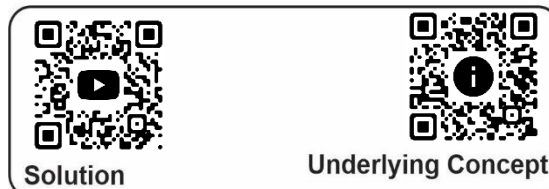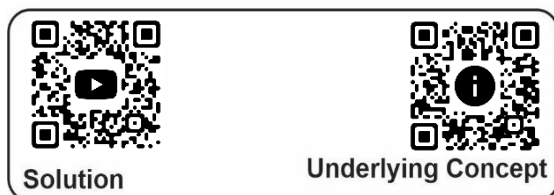
Practice Questions:

1. Which alignment of magnetic moment shows ferrimagnetism?
   (1) $\uparrow\uparrow\downarrow\uparrow\uparrow\downarrow$
   (2) $\uparrow\uparrow\uparrow\uparrow\uparrow\uparrow$
   (3) $\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow$
   (4) $\downarrow\downarrow\downarrow\downarrow\downarrow\downarrow$

2. Which among the following is antiferromagnetism compound?
   (1) Fe_3O_4 (2) MnO
   (3) $MgFe_2O_4$ (4) $NaCl$

3. Substances which are weakly repelled by magnetic field are known as
   (1) Paramagnetic
   (2) Diamagnetic
   (3) Ferromagnetic
   (4) Antiferromagnetic

4. Unit of magnetic moment is
   (1) Debye
   (2) Coulomb
   (3) Bohr magneton
   (4) Candela

AIATS-01 (CF + OYM), Q.59
Topic: Depression of Freezing Point

The following solutions were prepared by dissolving 10 g of urea in 250 g of water (P_1), 10 g of NaCl in 250 g of water (P_2) and 10 g of glucose in 250 g of water (P_3). The right option for decreasing order of freezing point of these solutions is
   (1) $P_3 > P_1 > P_2$ (2) $P_2 > P_1 > P_3$
   (3) $P_1 > P_2 > P_3$ (4) $P_2 > P_3 > P_1$

Scan/Click

Solution   Underlying Concept

Practice Questions:

1. Which among the following aqueous solutions have (Assuming 100% ionisation) lowest freezing point?
   (1) 0.1 m urea   (2) 0.1 m NaCl
   (3) 0.1 m glucose   (4) 0.1 m $CaCl_2$

2. Molal depression constant depends on
   (1) Concentration of solute
   (2) Temperature
   (3) Nature of solute
   (4) Nature of solvent

3. Freezing point of an aqueous solution containing 0.02 mole urea dissolved in 100 g of water is (k_f for H_2O is 1.86 k kg mol^{-1})
   (1) $- 0.372°C$
   (2) $1.86° C$
   (3) $- 1.86°C$
   (4) $- 3.72°C$

AIATS-01 (CF + OYM), Q.61
Topic: Ideal and Non-Ideal Solution

The mixture which shows negative deviation from Raoult's law is
   (1) Benzene + Toluene
   (2) Chloroethane + Bromoethane
   (3) Acetone + Chloroform
   (4) Carbon disulphide + Acetone

Scan/Click

Solution   Underlying Concept
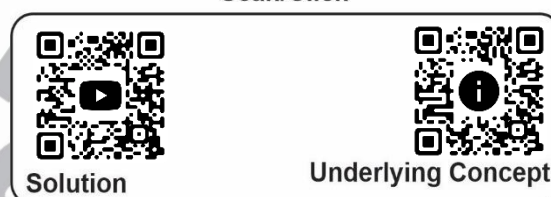
Practice Questions:

1. Which among the following mixture shows negative deviation from Raoult's law?
   (1) Benzene + Toluene
   (2) Ethanol + Water
   (3) Acetone + Chloroform
   (4) Benzene + Acetone

2. Which among the following is incorrect regarding the solution showing positive deviation from Raoult's law?
   (1) $\Delta H_{mix} > 0$ (2) $\Delta S_{mix} > 0$
   (3) $\Delta G_{mix} > 0$ (4) $\Delta V_{mix} > 0$

3. On mixing 10 ml of n-hexane and 20 ml of n-heptane, the total volume of solution is
   (1) 30 ml   (2) 30.5 ml
   (3) 29.0 ml   (4) 31.0 ml

AIATS-01 (CF + OYM), Q.79
Topic: Order of Reaction

When initial concentration of the reactant is doubled, the half-life period of a first order reaction
   (1) is halved
   (2) is doubled
   (3) becomes one fourth
   (4) remains unchanged

Scan/Click

Solution   Underlying Concept
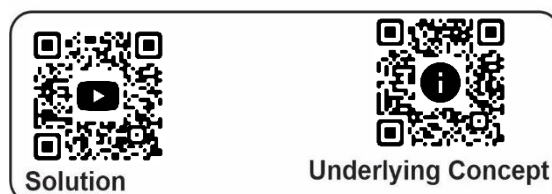
1. $t_{1/2}$ for a first order reaction is 10 minutes $t_{75\%}$ for the reaction is

   (1) 20 minutes   (2) 10 minutes

   (3) 50 minutes   (4) 100 minutes

2. On doubling the initial concentration of reaction, half life of a reaction also doubles. The order of reaction is

   (1) Zero order   (2) First order

   (3) Second order   (4) Third order

3. The rate constant of a reaction is 0.0693 s^{-1}. Half life of the reaction is

   (1) 6.93 seconds   (2) 10 seconds

   (3) 0.693 seconds   (4) 20 seconds

4. Correct graph for the first order reaction is

   (1)   (2)

   (3)   (4)

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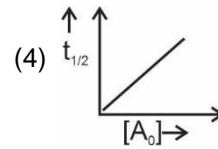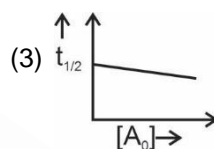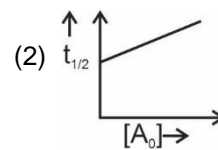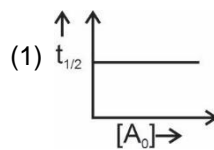
**Based on
AIATS-01 CF + OYM**

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CONCEPT STRENGTHENING SHEET
CSS-01(CHEMISTRY)
Answer Key

AIATS-01 (CF + OYM), Q.60

Topic: Ideal Solutions

1. (2)
2. (1)
3. (4)
4. (1)

AIATS-01 (CF + OYM), Q.69

Topic: Product of Electrolysis

1. (1)
2. (2)
3. (3)
4. (4)

AIATS-01 (CF + OYM), Q.67

Topic: Elevation of Boiling Point

1. (2)
2. (4)
3. (1)

AIATS-01 (CF + OYM), Q.76

Topic: Variation of Molar Conductivity with Concentration

1. (1)
2. (2)
3. (3)

AIATS-01 (CF + OYM), Q.57

Topic: Properties of Solid

1. (1)
2. (2)
3. (2)
4. (3)

AIATS-01 (CF + OYM), Q.59

Topic: Depression in Freezing Point

1. (4)
2. (4)
3. (1)

AIATS-01 (CF + OYM), Q.61

Topic: Ideal and Non-Ideal Solution

1. (3)
2. (3)
3. (1)

AIATS-01 (CF + OYM), Q.79

Topic: Order of Reaction

1. (1)
2. (1)
3. (2)
4. (1)

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