	INDIAN SCHOOL AL WADI AL KABIR	
Class: XII	**Department: SCIENCE 2022 – 23** **SUBJECT : CHEMISTRY**	**Date of submission:** **14.09.2022**
PRACTICE WORKSHEET	**Chapter: SOLUTIONS – PART 2**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

1. Determine the amount of $CaCl_2$ (i = 2.47) dissolved in 2.5 litre of water such that its osmotic pressure is 0.75 atm at 27° C.
2. Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litres of water at 25° C, assuming that it is completely dissociated
3. 2 g of benzoic acid (C_6H_5COOH) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62 K. Molal depression constant for benzene is 4.9 K kg mol^{-1}. What is the percentage association of acid if it forms dimer in solution?
4. 0.6 mL of acetic acid (CH3COOH), having density 1.06 g mL^{-1}, is dissolved in 1 litre of water. The depression in freezing point observed for this strength of acid was 0.0205°C. Calculate the Van 't Hoff factor . K_f = 1.86KKgmol $^{-1}$
5. What is the value of van't Hoff factor if solute molecules undergo dimerisation?
6. Define Van't Hoff factor
7. Calculate the freezing point of an aqueous solution containing 10.50 g of $MgBr_2$ in 200 g of water. Assume complete dissociation (Molar mass of $MgBr_2$ = 184 g) (K_f for water = 1.86 K kg mol^{-1})
8. Calculate the boiling point of a solution prepared by adding 15.00 g of NaCl to 250.0 g of water. (K_b for water = 0.512 K kg mol^{-1}, Molar mass of NaCl = 58.44 g)

Q.NO	ANSWERS
1	*w* = 0.75x111x2.5 / 2.47x0.0821x300 =3.42g
2	Now π = icrt = iW_2 X RT / M_2 X V = 3 X 25 X 10^{-3} X 0.082 X 298 / 174 X 2 = 5.27 X 10^{-3} atm.

3	M_2 = 241.98 g mol^{-1}, Molecular mass of C_6H_5COOH = 122 g mol^{-1} $2C_6H_5COOH \rightleftharpoons (C_6H_5COOH)_2$, Degree of association of benzoic acid in benzene = 99.2%
4	Molality = 0.0106 mol kg^{-1}, ΔT_f = 0.0197 K Van 't Hoff factor (i) = 1.041
5	Less than unity
6	the ratio of observed colligative property to calculated colligative property.
7	$\Delta T_f = i \times K_f \times m$ $= \frac{3 \times 1.86 \times 10.5 \times 1000}{184 \times 200}$ $= 1.59$ $\Delta T_f = T_f^o - T_f$ $1.59 = 173.15 - T_f$ $T_f = 173.15 - 1.59$ $= 271.56K$
8	$NaCl \rightarrow Na^+ + Cl^-$ $i = 2$ $\Delta T_b = \frac{2 \times 0.512 \times 1000 \times 15}{250 \times 58.44}$ $= 1.05$ Boiling point of solution = 100 + 1.05 $= 101.05^\circ C$

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