



INDIAN SCHOOL SOHAR
UNIT TEST 2017-2018
CHEMISTRY

STD: XII
Date: 18-05-2017

MARKS: 50
TIME: 2 Hrs

Instructions:

1. All questions are compulsory.
 2. Question nos. 1-2 are very short answer questions and carry 1 mark each.
 3. Question nos. 3-7 are short answer questions and carry 2 marks each.
 4. Question nos. 8-15 are short answer questions and carry 3 marks each.
 5. Question no. 16 is value based question and carry 4 marks.
 6. Question nos. 17-18 are long answer questions and carry 5 marks each.
 7. Write serial no. of the question before attempting it.
 8. Use log tables for calculations.
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1. Write the IUPAC name of tert-pentyl chloride.
2. State Kohlrausch law of independent migration of ions.
3. Identify and indicate the presence of centre of chirality in 1,2-dibromopentane. How many stereoisomers are possible? What are they called?
4. Arrange the following halides in the increasing order of S_N2 reactivity:
 CH_3Cl , CH_3Br , CH_3CH_2Cl , $(CH_3)_2CHCl$ and justify.

OR

Which one is more easily hydrolysed by aqueous KOH and why?

$C_6H_5CH_2Cl$ or $C_6H_5CHClC_6H_5$

5. Why is a mixture of glycol and water used in a car radiator while driving through a colder region having sub-zero temperature? What are such properties called?
6. Account for the following:
 - a) Haloarenes undergo electrophilic substitution reactions slowly than benzene.
 - b) S_N1 reaction takes place by racemization.
7. State Raoult's law for a solution containing two volatile liquids. How does Raoult's law become a special case of Henry's law.
8. Why do haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the main product. What are such nucleophiles called?
9. Illustrate the following with an example:
 - a) Diazotisation reaction
 - b) Saytzeff's rule
 - c) Sandmeyer reaction

OR

Explain, giving reactions, what happens when

- a) Chlorobenzene is subjected to Friedel-Crafts alkylation.
 - b) Grignard reagent reacts with moisture.
 - c) Bromobenzene is treated with Mg in the presence of dry ether.
10. Oxygen is bubbled through water at 293K. Assuming that oxygen exerts a partial pressure of 0.98 bar, calculate the solubility of O_2 in gL^{-1} . The value of Henry's constant is 34.84 Kbar.

11. How will you bring about the following conversions?
 a) But-1-ene to but-2-ene b) Tert-butyl bromide to isobutyl bromide
 c) Ethanol to propanenitrile
12. A 0.5M aqueous solution of a substance with molar mass 60 gmol^{-1} has a density of 1 gcm^{-3} at 298 K. Find its vapor pressure if vapor pressure of pure water at 298 K is 20 torr.
13. The boiling point of a solution containing 5 g of solute B (molar mass 128 gmol^{-1}) per 50 g of solvent is raised by 0.4 K while 6 g of another solute C raises the boiling point of 50 g of the same solvent by 0.6 K. Calculate the molar mass of solute C.
14. 0.5 M solution of a salt placed between platinum electrodes 2 cm apart each of area of cross section 4 cm^2 has a resistance of 25Ω . Calculate the conductivity and molar conductivity of the solution.
15. Account for the following:
 a) Iron does not rust even if zinc coating gets broken in a galvanized iron pipe.
 b) Molar conductivity increases steeply at infinite dilution for a weak electrolyte.
 c) Cell potential of mercury cell remains constant during its life.
16. Pranav and his friends went for a picnic to a river side resort. One of his friends replaced the watch cell and wanted to throw the used cell into the river. Pranav stopped him from doing so and suggested that the old cell must be thrown in the garbage container.
 Based on the above passage, answer the following questions:
 a) What type of cells are used in watches and hearing aids?
 b) Write the reactions taking place at the anode and cathode in such a cell.
 c) Why did Pranav stop his friend from throwing the cell into the river?
 d) What values are associated with his decision?
17. a) 2000 coulomb of electricity is passed through an aqueous solution of NaCl. Calculate the mass of Cl_2 liberated at anode and H_2 evolved at cathode.
 (At.mass of H=1, Cl= 35.5 g mol^{-1})
 b) What are secondary cells? Write the chemistry of recharging the lead storage battery, highlighting all the materials that are involved during recharging.
- OR
- a) Calculate the cell potential of the given cell reaction
 $\text{Zn} + 2\text{Ag}^+(0.01\text{M}) \longrightarrow \text{Zn}^{2+}(0.1\text{M}) + 2\text{Ag}$ if $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76\text{V}$; $E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$.
 b) What are fuel cells? Explain $\text{H}_2\text{-O}_2$ fuel cell giving electrode reactions. Give its advantages.
18. a) What role do molecular interactions play in deciding the vapour pressure of the following solutions? Explain.
 i) alcohol and acetone ii) chloroform and acetone.
 b) 1% (w/v) KCl solution is ionized to the extent of 82%. What would be its osmotic pressure at 18°C ? $R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$
- OR
- a) What is meant by abnormal molecular mass? What is it due to? Explain giving examples.
 b) A substance X (molar mass 94) associates as $2\text{X} \rightleftharpoons \text{X}_2$ when dissolved in CCl_4 . If 10 g of X is dissolved in 2 Kg of CCl_4 , the freezing point is lowered by 1.08°C . Calculate the degree of association of X given K_f for CCl_4 is $31.8 \text{ K Kg mol}^{-1}$.