No. of printed pages : 02

[35]

SARDAR PATEL UNIVERSITY

B. Sc. (Third Semester Examination)

US03EICH01 – Traditional Methods of Analysis

Date: 2/12/19 Time: 2.00pm to4.00pm

Total Marks : 70

Q.1. Choose the correct option for the following : [10]

i. A dilute solution of sodium carbonate was added to two test tubes one containing dil HCl(A) and the other containing dil NaOH(B).The correct observation was
(a)A red gas liberated in test tube A
(b) A brown gas liberated in test tube B
(c)A colorless gas liberated in test tube A
(d) A colorless gas liberated in test tube B

ii. Which solution is used to maintain constant pH, if a small amount of acid or base is added to it?
(a) salt solution
(b) strong base
(c) indicator
(d) Buffer

iii. Ammine, Carbonyl and Nitrosyl are----------.
(a) complexing agent
(b) acid
(c) buffer
(d)simple agent

iv. A chelating agent can be....
(a) monodentate
(b) polydentate
(c) Bidentate
(d) all of these

v. Which of the following indicator is added in the titration of $KMnO_4$ with $FeSO_4$
(a) $KMnO_4$
(b) Mureoxide
(c) Starch
(d) Eriochrome black- T

vi. Which of the following is a redox titration?
(a) titration of HCl with NaOH
(b) titration of CH_3COOH with NaOH
(c) titration of oxalic acid with $KMnO_4$
(d) all of these

vii The temporary hardness of water due to calcium bicarbonate can be removed by
(a)adding calcium chloride
(b)boiling
(c)filtration
(d)adding HCl

viii Indicator used to determine sulphate in hard water by EDTA titration is
(a)phenolphthalein
(b) diphenyl amine
(c) Eriochrome black T
(d)Eosin

ix Molality is
(a)number of moles solute dissolved per liter of solution
(b)number of moles of solute dissolved per liter of solvent
(c)number of moles of solute dissolved per Kg of solvent

(P.T.O.)

(d) number of moles of solute dissolved per Kg of solution.

x oxidation involves
(a)gain of electrons
(b)addition of hydrogen
(c)decrease in oxidation number
(d)loss of electrons

Q.2. Answer any ten: [20]

i. Define: Titrand and titration error.
ii. What are universal indicators? Give example.
iii. Define with example: Chelating agent & Demasking agent
iv. Discuss back titration used for EDTA titration.
v. Define: Oxidizing agent & Voltage
vi. Sulphuric acid is used for potassium permanganate titration in place of hydrochloric acid.
vii Distinguish clearly between hard water and soft water.
viii Explain the method to determine turbidity of water.
ix Give method and calculation to determine acidity in water.
x Write the conditions fulfilled by common titrimetric methods of analysis.
xi List out the points which should be kept in mind during complexometric titration.
xii Distinguish clearly between oxidation and reduction with example.

Q.3.a. Discuss the types of reactions involved in titrimetric analysis with suitable examples. [05]

b. Write the conditions which must be fulfilled by common titrimetric analysis. [05]

OR

Q.3.a. Show that at the color change interval, pH of the system is $pH = pK_{In} \pm 1$. [05]

b. Discuss the method to determine percentage purity of washing soda. [05]

Q.4.a. Discuss different types of EDTA titrations. [05]

b. List out the points which should be kept in mind during complexometric titration. [05]

OR

Q.4.a. What are the requirements for metal ion indicator for use in visual detection of end point? [05]

b. Explain stability constant and formation of complex ion by giving proper example. [05]

Q.5. Explain titration curve for iron (II) & cerium (IV) in detail by plotting proper graph. [10]

OR

Q.5. Write in detail on internal redox indicators, explaining working of Diphenyl amine indicator. [10]

Q.6.a. Explain the different sources of water pollution. [05]

b. Give details about organic pollution. [05]

OR

Q.6.a. Discuss the methods to analyze the presence of alkalinity, fluoride and chloride in water sample. [05]

b. Discuss the methods to analyze the presence of sulphate and conductivity in water sample. [05]

—X—