

# ANNUAL EXAMINATION – 2012-2013

Class – X I

**SUBJECT – CHEMISTRY**

**Paper 2**

**(Practical)**

Time – 3 Hrs.

M.M. – 20

Candidates are allowed additional 15 minutes for only reading the paper.

They must NOT start writing during this time

All answers must be written in the Answer Booklet provided separately.

Question 1 is an oxidation – reduction titration in which sufficient working details are given. All essential working must be shown.

Question 2 is an exercise dealing with identification of organic compounds. Credit will be given for precise observations recorded and for well drawn deductions.

Question 3 is an exercise in qualitative analysis.

Mathematical Tables are provided.

Read the questions carefully and follow the given instructions.

Answer all questions.

All working including rough work, should be done on the same sheet as the rest of the answer.

The intended marks for questions or parts of questions are given in brackets [ ].

## Question 1

You are provided with two solutions as follows -

[8]

- a) C-10 is a solution prepared by dissolving 1.75 gms of potassium manganate (VII),  $\text{KMnO}_4$  per litre.
- b) C-11 is a solution prepared by dissolving 21.9 gms of hydrated ammonium iron (II) sulphate crystals,  $(\text{NH}_4)_2\text{SO}_4 \cdot \text{FeSO}_4 \cdot x\text{H}_2\text{O}$  per litre.

Procedure:

Rinse and fill the burette with the solution C-10 of potassium manganate (VII). Pipette out or 25 ml of ammonium iron (II) sulphate solution C-11 into a clean conical flask. To this, add 20 ml of C-12, solution of dilute  $\text{H}_2\text{SO}_4$  specially provided provided for titration.

Titrate this solution by running C-10 from the burette till one drop of this solution gives a permanent light pink colour to solution C-11 in the conical flask. Ensure that the pink colour obtained does not disappear on shaking the contents of the conical flask.

Repeat the above procedure of titration to get at least two concordant readings

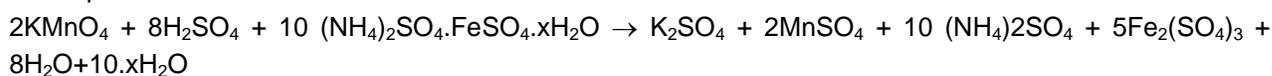
Tabulate your readings.

State:

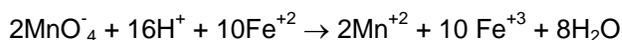
- i) The capacity of the pipette used.
- ii) The titre value you intend to use in your calculations.

Show the titre value to the Visiting Examiner.

The equations for the above reactions are as follows:



OR



Relative atomic masses: K=39 Fe=56 N=14 S=32 H=1 O=16 Mn=55

Calculate the following:

- a) The molarity of the potassium manganate (VII) solution C-10
- b) The molarity of hydrated ammonium iron (II) sulphate solution C-11
- c) The molecular mass of hydrated ammonium iron (II) sulphate deduced from the experimental data.
- d) The numerical value of x, i.e. the number of molecules of water of crystallization in  $(\text{NH}_4)_2\text{SO}_4 \cdot \text{FeSO}_4 \cdot x\text{H}_2\text{O}$ .

## Question 2

In this exercise, you are required to study the effect of change in concentration of the reactants on the rate of reaction between magnesium and dilute sulphuric acid. [5]

You are provided with the following:

- a) Five pieces of magnesium ribbon of 3 cm length.
- b) A solution of 1 M  $\text{H}_2\text{SO}_4$  C-13.

Proceed as follows:

In a 250 ml beaker, place 75 ml of C-13 noting the time in your wrist watch, simultaneously immerse a magnesium ribbon. Note the time taken for the ribbon to completely dissolve in the acid.

Repeat the experiment with 60ml, 40ml, 30ml, and 20 ml of the acid diluting it with distilled water, up to 75 ml. and note the time in each case. Tabulate your results as follows:

Expt. No.	Volume of the solution C-13	Volume of water	Time in secs
1	75 ml.	0 ml.	
2	60 ml.	15 ml.	
3	40 ml.	35 ml.	
4	30 ml.	45 ml.	
5	20 ml.	55 ml.	

From your results:

- i) Plot a graph between the concentration of sulphuric acid (in terms of the volume of acid taken) and the time taken for the ribbon to completely dissolve in the acid.
- ii) From the graph, find out the time taken for the reaction when 25 ml of solution C-13 is used.
- iii) Predict the effect of change in concentration of acid on the rate of the above reaction from the nature of your graph.  
Show the result to the Visiting Examiner.

**Question 3**

Analyse qualitatively the substance C-15 which contains two anions and two cations. Identify these ions.

- a) While testing anions you must mention. [7]
  - i) How the solution/soda extract was prepared?
  - ii) How gases were identified.
  - iii) The confirmatory test for each anion  
Show the result as required to the Visiting Examiner.
- b) While testing cations you must mention –
  - i) How the original solution for group analysis was prepared?
  - ii) The formal group analysis with pertinent group reagents.
  - iii) The confirmatory test of each cations.  
Show the result as required to the Visiting Examiner.

