ICSE CLASS 10 EXAMINATION

PRACTICE QUESTION PAPER

CHEMISTRY (SCIENCE PAPER – 2)

Chapter 4: Analytical Chemistry – Use of Ammonium Hydroxide and Sodium Hydroxide

Maximum Marks: 40 ***Time allowed: One hour***

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first **10** minutes. This time is to be spent in reading the question paper.*
3. ***The time given at the head of this Paper is the time allowed for writing the answers.***
4. ***Section A** is compulsory. Attempt **any two** questions from **Section B**.*
5. *The intended marks for questions or parts of questions are given in brackets [ ].*

SECTION A (20 Marks)

*(Attempt **all** questions from this Section.)*

Question 1

Choose the correct answers to the questions from the given options. [8]
(Do not copy the question, write the correct answers only.)

(i) Which one of the following salt solutions is **colourless**?

(a) Iron(II) sulphate

(b) Copper(II) sulphate

(c) Zinc sulphate

(d) Iron(III) chloride

(ii) The colours of the aqueous solutions of four salts P, Q, R and S are given in the table below. Which solution will give a **reddish brown precipitate** on adding sodium hydroxide solution?

Solution	P	Q	R	S
Colour of the solution	Pale green	Yellowish brown	Blue	Colourless

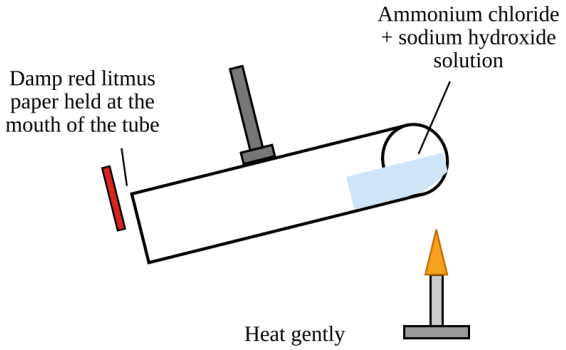
(a) P

(b) Q

(c) R

(d) S

(iii) A mixture of ammonium chloride and sodium hydroxide solution is heated gently, as shown below. What is observed at the mouth of the test tube?



(a) The damp red litmus paper turns blue; the gas evolved is ammonia.

(b) The damp red litmus paper turns white; the gas evolved is chlorine.

(c) The damp red litmus paper remains red; the gas evolved is hydrogen.

(d) The damp red litmus paper turns blue; the gas evolved is hydrogen chloride.

(iv) Which one of the following metals liberates hydrogen when heated with a concentrated solution of sodium hydroxide?

(a) Iron

(b) Magnesium

(c) Copper

(d) Zinc

(v) Which one of the following is an **amphoteric oxide**?

(a) Aluminium oxide

(b) Sodium oxide

(c) Magnesium oxide

(d) Copper(II) oxide

(vi) **Assertion (A):** No precipitate is formed when ammonium hydroxide is added to a solution of a calcium salt.
Reason (R): Ammonium hydroxide is a weak alkali and gives too low a concentration of hydroxide ions to precipitate calcium hydroxide.

(a) (A) is true but (R) is false.

(b) (A) is false but (R) is true.

(c) Both (A) and (R) are true, and (R) is the correct explanation of (A).

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(vii) Which one of the following hydroxides dissolves in excess of sodium hydroxide solution, but **not** in excess of ammonium hydroxide solution?

(a) Zinc hydroxide

(b) Copper(II) hydroxide

(c) Iron(III) hydroxide

(d) Lead(II) hydroxide

(viii) What is the colour of the precipitate formed when sodium hydroxide solution is added to iron(II) sulphate solution?

(a) Dirty green

(b) Reddish brown

(c) White

(d) Pale blue

Question 2

(i) Complete the following sentences by choosing the correct option from the brackets: [3]

(a) Zinc hydroxide is _____ in excess of ammonium hydroxide solution. (soluble / insoluble)

(b) Lead hydroxide dissolves in excess of sodium hydroxide solution to form sodium _____. (zincate / plumbite)

(c) An aqueous solution of an iron(III) salt is _____ in colour. (pale green / yellowish brown)

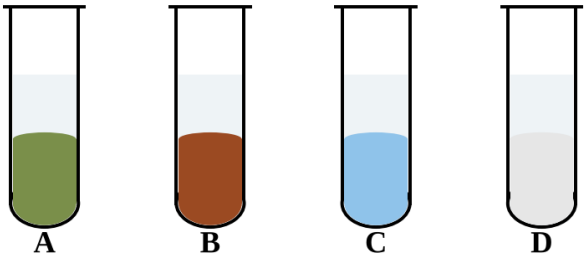
(ii) Match Column A with Column B. (Write the answers as (a)–(number), and so on.) [3]

Column A	Column B
(a) Copper(II) sulphate solution + excess of ammonium hydroxide	1. Dirty green precipitate
(b) Iron(II) sulphate solution + sodium hydroxide solution	2. Deep blue solution
(c) Iron(III) chloride solution + sodium hydroxide solution	3. Reddish brown precipitate
	4. Colourless solution

Question 3

(i) A few drops of sodium hydroxide solution are added to solutions of four different salts A, B, C and D. The precipitates formed are shown in the diagram below. The precipitate in tube D dissolves in excess of sodium hydroxide solution. [3]

Precipitates formed on adding a few drops of sodium hydroxide solution



(a) Name the cation present in the salt solution of tube A and of tube C.

(b) Name the precipitate in tube B and give its formula.

(c) Name **two** cations which could be present in tube D.

(ii) Give reasons for the following: [3]

(a) Sodium hydroxide solution is added drop by drop to a salt solution, and not all at once.

(b) No precipitate is formed when ammonium hydroxide is added to calcium nitrate solution.

(c) Zinc oxide is called an amphoteric oxide.

SECTION B (20 Marks)

*(Attempt **any two** questions from this Section.)*

Question 4

Sodium hydroxide solution and ammonium hydroxide solution are added, a few drops at a time and then in excess, to four salt solutions P, Q, R and S. The observations are recorded in the table below. (The salts are the nitrate or sulphate of zinc, lead, calcium and copper, not necessarily in this order.)

Solution	Few drops of NaOH solution	Excess of NaOH solution	Few drops of NH_4OH solution	Excess of NH_4OH solution
P	White gelatinous precipitate	Precipitate dissolves	White gelatinous precipitate	Precipitate dissolves
Q	Chalky white precipitate	Precipitate dissolves	Chalky white precipitate	Precipitate does not dissolve
R	Pale blue precipitate	Precipitate does not dissolve	Pale blue precipitate	Deep blue solution formed
S	White precipitate	Precipitate sparingly soluble	No precipitate	No precipitate

(i) Answer the following questions based on the table: [4]

(a) Identify the cations present in P and Q.

(b) Name the cation present in R. Write the formula of the compound which gives the deep blue colour.

(c) Why is no precipitate formed when ammonium hydroxide is added to S?

(d) If Q is lead nitrate, write the balanced equation for its reaction with sodium hydroxide solution.

(ii) If P is zinc sulphate solution: [3]

(a) Write the balanced equation for the formation of the white precipitate with sodium hydroxide solution.

(b) Write the balanced equation for the dissolving of the precipitate in excess of sodium hydroxide solution.

(c) Name the compound formed in (b).

(iii) How would you distinguish between the following pairs of solutions using the reagent given in brackets? State the observations. [3]

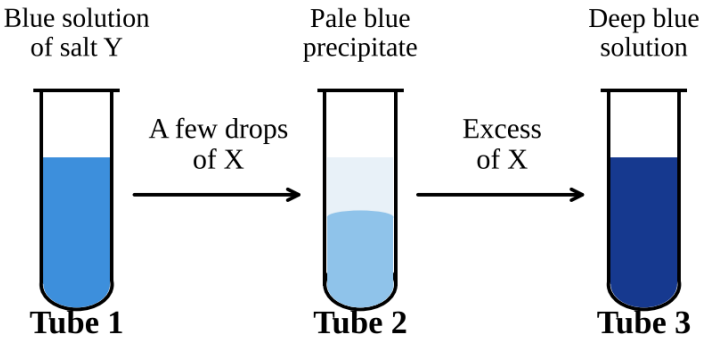
(a) Zinc sulphate solution and lead nitrate solution (ammonium hydroxide solution, in excess)

(b) Calcium nitrate solution and lead nitrate solution (ammonium hydroxide solution)

(c) Iron(II) sulphate solution and iron(III) chloride solution (sodium hydroxide solution)

Question 5

The diagram below shows the changes observed when reagent X is added, first a few drops and then in excess, to a blue solution of a salt Y.



(i) Answer the following questions based on the diagram: [4]

(a) Name the reagent X and the cation present in the salt Y.

(b) Name the pale blue precipitate in tube 2.

(c) Write the formula of the compound which gives the deep blue colour in tube 3.

(d) What would you observe if sodium hydroxide solution were used in place of X, in excess?

(ii) Assuming that Y is copper(II) sulphate, write balanced equations for: [3]

(a) the formation of the pale blue precipitate.

(b) the formation of the deep blue solution.

(c) the reaction of Y with sodium hydroxide solution.

(iii) Certain metals react with hot, concentrated sodium hydroxide solution. [3]

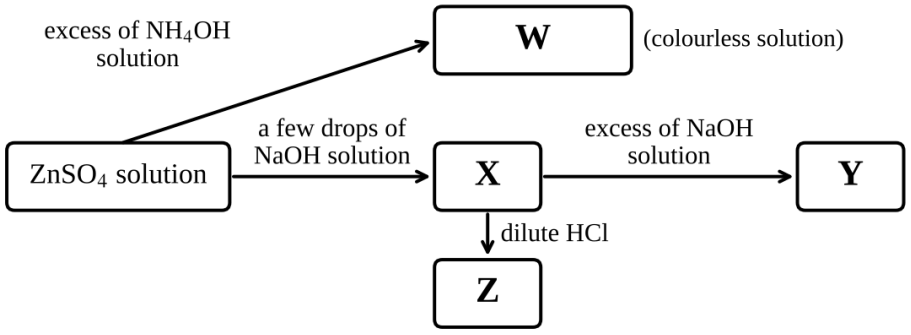
(a) Write the balanced equation for the action of hot concentrated sodium hydroxide on zinc.

(b) Write the balanced equation for the action of boiling sodium hydroxide solution on aluminium.

(c) Name the gas evolved in (a) and (b) and state how it is tested.

Question 6

The flow chart below shows some reactions of zinc sulphate solution. X, Y, Z and W are compounds of zinc.



(i) Answer the following questions based on the flow chart: [4]

(a) Name X and give its formula.

(b) Give the formula of Y.

(c) Give the formula of Z.

(d) Name the compound W formed when excess ammonium hydroxide is added.

(ii) Zinc oxide is an amphoteric oxide. [3]

(a) What is meant by an amphoteric oxide?

(b) Write the balanced equation for the reaction of zinc oxide with sodium hydroxide.

(c) Write the balanced equation for the reaction of zinc oxide with hydrochloric acid.

(iii) State how you would distinguish between the following. Give the observations. [3]

(a) Sodium hydroxide solution and ammonium hydroxide solution (using copper(II) sulphate solution)

(b) Ammonium sulphate solution and sodium sulphate solution (using sodium hydroxide solution)

(c) Aluminium and magnesium (using hot concentrated sodium hydroxide solution)

****** END OF PAPER ******