ICSE CLASS 10 EXAMINATION

PRACTICE QUESTION PAPER

CHEMISTRY (SCIENCE PAPER – 2)

Chapter 9: Study of Compounds – Ammonia

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 of the following is used to dry ammonia gas?
- (a) Concentrated sulphuric acid
- (b) Phosphorus pentoxide
- (c) Quicklime
- (d) Anhydrous calcium chloride

(ii) Which pair of substances is suitable for the laboratory preparation of ammonia?
- (a) Ammonium chloride and calcium hydroxide
- (b) Ammonium nitrate and calcium hydroxide
- (c) Sodium chloride and calcium hydroxide
- (d) Ammonium chloride and hydrochloric acid

(iii) In Haber's process, the catalyst used is:
- (a) Platinum gauze
- (b) Finely divided iron
- (c) Vanadium pentoxide
- (d) Nickel

(iv) Ammonia burns in oxygen with:
- (a) A pale blue flame
- (b) A yellowish green flame
- (c) A brick red flame
- (d) A smoky flame

(v) The catalyst used in the catalytic oxidation of ammonia in Ostwald's process is:

(a) Platinum

(b) Iron

(c) Nickel

(d) Molybdenum

(vi) **Assertion (A):** Concentrated sulphuric acid is not used to dry ammonia gas.
Reason (R): Ammonia is a basic gas and reacts with sulphuric acid to form ammonium sulphate.

(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) When ammonia reacts with an excess of chlorine, the product formed is:

(a) Nitrogen and ammonium chloride

(b) Nitrogen trichloride

(c) Hydrogen chloride only

(d) Ammonium hydroxide

(viii) Ammonia gas is passed over heated copper(II) oxide. The colour change observed is:

(a) Black to reddish brown

(b) Black to green

(c) Blue to white

(d) Yellow to grey

Question 2

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

(a) A _____ pressure favours the formation of ammonia in Haber's process. (high / low)

(b) The catalytic oxidation of ammonia over platinum is carried out at about _____. (800 °C / 50 °C)

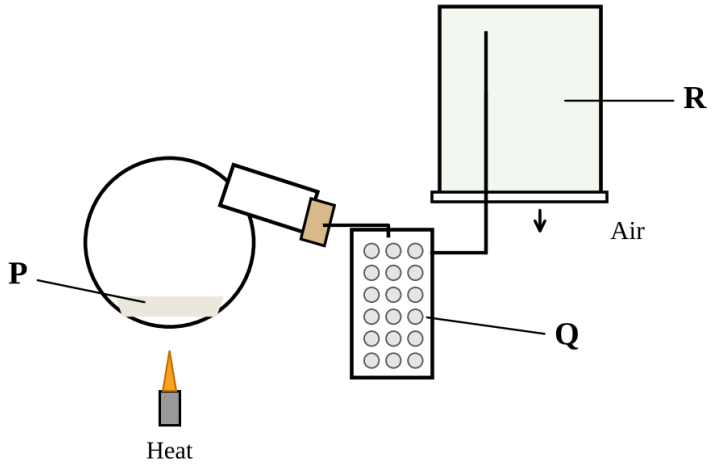
(c) Aqueous ammonia is a _____ base. (weak / strong)

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

Column A	**Column B**
(a) Ammonium hydroxide added to copper(II) sulphate solution in excess	1. Deep blue solution
(b) Excess of chlorine reacts with ammonia	2. Nitrogen trichloride
(c) Ammonium salt treated with Nessler's reagent	3. Brown colouration or precipitate
	4. Pale green precipitate

Question 3

(i) The diagram below shows the laboratory preparation of dry ammonia gas. [3]



(a) Name the mixture P and write the equation for the reaction taking place on heating.

(b) Name the drying agent Q. Why is concentrated sulphuric acid not used for this purpose?

(c) Why is the gas jar R kept with its mouth downwards?

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

(a) Ammonium nitrate is not used with an alkali for the preparation of ammonia.

(b) Ammonia gas cannot be collected over water.

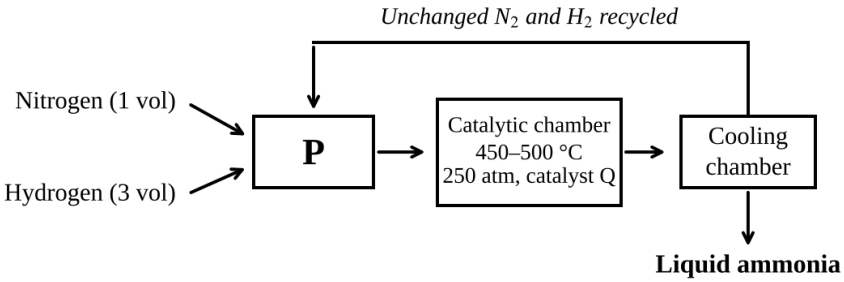
(c) Aqueous ammonia is used to remove grease stains from woollen clothes.

SECTION B (20 Marks)

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

Question 4

The flow chart below shows the industrial manufacture of ammonia from nitrogen and hydrogen.



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

(a) Name the process. Write the balanced equation for the reaction taking place in the catalytic chamber.

(b) What is the function of P?

(c) Name the catalyst Q and one promoter used.

(d) State one source each of nitrogen and hydrogen used in this process.

(ii) Answer the following questions on the favourable conditions: [3]

(a) Why does a high pressure favour the formation of ammonia?

(b) Why is a low temperature not used although the reaction is exothermic?

(c) How is ammonia separated from the unchanged nitrogen and hydrogen?

(iii) Ammonia acts as a reducing agent when passed over heated copper(II) oxide. [3]

(a) Write the balanced equation for the reaction.

(b) State the observation in the hard glass tube.

(c) How is the water formed in the reaction identified?

Question 5

The table below gives the action of ammonium hydroxide on solutions of some salts.

	Solution	Colour of precipitate with NH_4OH	Effect of excess NH_4OH
1	Iron(II) sulphate	(a)	Insoluble
2	Iron(III) chloride	Reddish brown	(b) .....
3	Zinc nitrate	White, gelatinous	(c) .....
4	Copper(II) sulphate	(d)	Dissolves to give a deep blue solution

(i) Complete the table by writing the answers (a), (b), (c) and (d): [4]

(ii) Write balanced equations for the reactions of ammonium hydroxide with: [3]

(a) iron(III) chloride solution.

(b) lead(II) nitrate solution.

(c) dilute sulphuric acid.

(iii) Ammonia reacts with chlorine. [3]

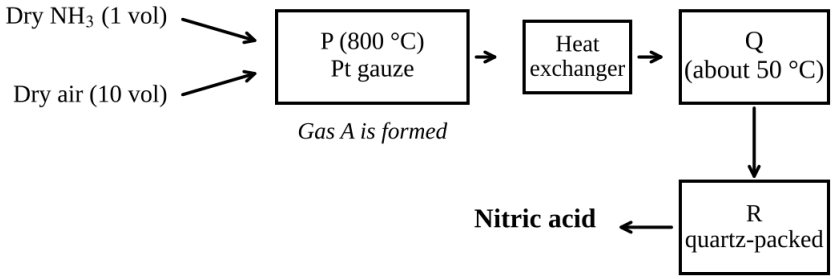
(a) Write the equation for the reaction when ammonia is in excess.

(b) What do you observe in this reaction?

(c) What is formed when chlorine is in excess? Which property of ammonia is shown by these reactions?

Question 6

The flow chart below shows the manufacture of nitric acid from ammonia.



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

(a) Name the process. Name the gas A.

(b) Write the equation for the reaction taking place in P.

(c) Write the equation for the reaction taking place in Q.

(d) Write the equation for the reaction in the absorption tower R.

(ii) Give reasons: [3]

(a) A large excess of air (ammonia : air = 1 : 10) is used.

(b) The platinum catalyst continues to glow even after heating is stopped.

(c) Quartz pieces are packed in the absorption tower.

(iii) Answer the following questions: [3]

(a) Describe a test to identify ammonia gas using concentrated hydrochloric acid.

(b) What is the effect of moist red litmus paper on ammonia gas?

(c) Why are chlorofluorocarbons (CFCs) being replaced by ammonia as a refrigerant?

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