

CHEMISTRY

STEP UP



Assignment - 1

Study of Compounds

- Â Hydrochloric acid
- Â Ammonia
- Â Sulphuric Acid
- Â Nitric Acid

HYDROGEN CHLORIDE AND HYDROCHLORIC ACID
Assignment Sheet

1. (a) (i) What must be added to sodium chloride to obtain hydrogen chloride?
(ii) Write the equation for the reaction which takes place in (a) (i) above reaction.
(iii) What would you see when hydrogen chloride mixes with ammonia?
- (b) Hydrogen chloride dissolves in water forming an acidic solution.
(i) Name the experiment which demonstrates that hydrogen chloride is very soluble in water.
(ii) Give three distinct tests (apart from using an indicator) you would carry out with this solution to illustrate the typical properties of an acid.
- (c) Write the equation for the reaction of hydrochloric acid with each the following :
(i) Lead nitrate solution (ii) Manganese (IV) oxide **[2000]**
2. Write the equation for the :
(a) Preparation of hydrogen chloride from sodium chloride and sulphuric acid. State whether the sulphuric acid should be concentrated or dilute.
(b) Reaction of hydrogen chloride with ammonia. **[2001]**
3. (a) (i) What happens when dilute hydrochloric acid is added to lead nitrate solution?
(ii) Describe the two colour changes which take place when moist blue litmus is placed in a gas jar of chlorine.
- (b) Manganese (IV) oxide, lead (IV) oxide and red lead (Pb_3O_4) react with concentrated hydrochloric acid liberating chlorine.
(i) What is the common property being shown by these metal oxides.
(ii) Write the equation for the reaction of concentrated hydrochloric acid with Pb_3O_4 . **[2002]**
4. State the observation & give a balanced equation for the following:- Excess of ammonium hydroxide is added to a substance obtained by adding hydrochloric acid in silver nitrate solution. **[2003]**

5. A solution of hydrogen chloride in water is prepared. The following substances are added to separate portions of the solution:

SR. No.	Substances added	Gas evolved	Odour
(a)	Calcium carbonate
(b)	Magnesium ribbon
(c)	Manganese (IV) oxide with heating
(d)	Sodium sulphide

Complete the table by writing the gas evolved in each case and its odour. **[2004]**

6. Write balanced equations for the following reactions :
 (a) Copper oxide and dilute Hydrochloric acid.
 (b) Manganese (IV) oxide and concentrated Hydrochloric acid. **[2005]**
7. (a) Name the experiment illustrated in Figure.
 (b) Which property of hydrogen chloride is demonstrated by this experiment?
 (c) State the colour of the water that has entered the round-bottomed flask. **[2005]**
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8. State what is observed when Hydrochloric acid is added to silver nitrate solution. **[2006]**
9. Write balanced equation for the reaction of dilute Hydrochloric acid with each of the following :
 (a) Iron (b) Sodium hydrogen carbonate
 (c) Iron (II) sulphide (d) Sodium sulphite
 (e) Sodium thiosulphate solution. **[2007]**
10. Write a balanced equation for the following reaction:-
 Sodium chloride from sodium carbonate solution and dilute hydrochloric acid. **[2007]**
11. Of the two gases, NH_3 & HCl , which is more dense. Name the method of collection of this gas. **[2007]**
12. Write the equations for the following reactions :
 (a) Dilute hydrochloric acid and sodium thiosulphate.
 (b) Dilute hydrochloric acid and lead nitrate solution. **[2008]**
13. (a) Why is hydrogen chloride not collected over water?
 (b) What property of hydrogen chloride is demonstrated when it is collected by downward delivery (upward displacement)? **[2008]**
14. Write a fully balanced equation for each of the following cases :
 (a) Red lead is warmed with concentrated hydrochloric acid.
 (b) Magnesium metal is treated with dilute hydrochloric acid. **[2009]**
15. The diagram shows a simple arrangement of the fountain experiment.
 (i) Name the two gases you have studied which can be used in this experiment.
 (ii) What is the common property demonstrated by this experiment ? **[2010]**
16. By the addition of only one solution how would you distinguish between dilute hydrochloric acid and dilute nitric acid ? **[2010]**

17. Select the correct answer from A, B, C & D. i) Aqua regia is a mixture of
A : Dilute hydrochloric and conc. nitric acid
B : Conc. hydrochloric & dilute nitric acid.
C : One part of conc. hydrochloric acid & 3 parts of conc. nitric acid.
D : 3 parts of conc. hydrochloric acid and 1 part of conc. nitric acid. **[2010]**
18. In the laboratory preparation of hydrochloric acid, HCl gas is dissolved in water.
(i) Draw a diagram to show the arrangement used for the absorption of HCl gas in water.
(ii) Why is such an arrangement necessary? Give two reasons.
(iii) Write the chemical equation for the laboratory preparation of HCl gas when the reactants are :
(A) below 200°C
(B) above 200°C **[2011]**
19. Rewrite the correct statement with the missing word/s:
Aqua regia contains one part by volume of nitric acid & three parts by volume of hydrochloric acid. **[2012]**
20. Give reasons for the following: Hydrogen chloride gas cannot be dried over quick lime. **[2012]**
21. Give a balanced equation for the reaction: Conc. hydrochloric acid & potassium permanganate soln. **[2012]**
22. Give balanced equations with conditions, if any, for the following conversions A to D.
A: Sodium Chloride \rightarrow Hydrogen Chloride
B: Hydrogen Chloride \rightarrow Iron (II) chloride
C: Hydrogen Chloride \rightarrow Ammonium chloride
D: Hydrogen Chloride \rightarrow Lead chloride **[2012]**
23. Identify the gas evolved in the following reactions when :
i) potassium sulphite is treated with dilute hydrochloric acid.
ii) concentrated hydrochloric acid is made to react with manganese dioxide. **[2013]**
24. State one appropriate observation for each of the following :
i) Copper sulphide is treated with dilute Hydrochloric acid.
ii) A few drops of dilute Hydrochloric acid are added to silver nitrate solution, followed by addition of ammonium hydroxide solution. **[2013]**
25. Fill in the blanks from the choices given within brackets :
Quicklime is not used to dry HCl gas because
(CaO is alkaline, CaO is acidic, CaO is neutral) **[2014]**
26. Write balanced equations for the following :
Action of dilute hydrochloric acid on sodium sulphide. **[2014]**

27. The following questions are pertaining to the laboratory preparation of hydrogen chloride gas:
 (i) Write the equation for its preparation mentioning the condition required.
 (ii) Name the drying agent used and justify your choice.
 (iii) State a safety precaution you would take during the preparation of hydrochloric acid. **[2015]**
28. Fill in the blank with the choices given in brackets.
 _____(AgCl / PbCl₂), a white precipitate is soluble in excess NH₄OH. **[2016]**
29. Choose the correct answer from the options given below:
 The aim of the Fountain Experiment is to prove that :
 A. HCl turns blue litmus red
 B. HCl is denser than air
 C. HCl is highly soluble in water
 D. HCl fumes in moist air **[2016]**
30. Write balanced chemical equations for each of the following:
 Action of Hydrochloric acid on sodium bicarbonate. **[2016]**
31. State your observation when :
 (i) Dilute Hydrochloric acid is added to Copper carbonate.
 (ii) Dilute Hydrochloric acid is added to Sodium thiosulphate.
 (iii) Dilute Hydrochloric acid is added to Lead nitrate solution. **[2016]**
32. Identify the gas evolved and give the chemical test in each of the following:
 (i) Dilute Hydrochloric acid reacts with Sodium sulphite.
 (ii) Dilute Hydrochloric acid reacts with Iron(II) sulphide. **[2016]**
33. Fill in the blanks from the choices given in brackets:
 Potassium sulphite on reacting. with hydrochloric acid releases _____ gas. (Cl₂, SO₂, H₂S) **[2017]**
34. State one relevant observation for each of the following reactions:
 Action of dilute Hydrochloric acid on iron (II) sulphide. **[2017]**
35. Certain blank spaces are left in the following table and these are labelled as A, B, C, D and E. Identify each of them. **[2017]**

Lab Preparation of	Reactants used	Products formed	Drying agent	Method collection
HCl gas	NaCl + H ₂ SO ₄	A _____	conc.H ₂ SO ₄	B _____

