CHEMISTRY

BOOKS - EVERGREEN CHEMISTRY (ENGLISH)

STUDY OF COMPOUNDS OF CHLORINE - HYDROGEN CHLORIDE

Worksheet 1 Give One Word For The Following

1. Drying agent used to dry HCl gas.

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2. Any drying agent with which HCl reacts.

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3. A black substance which on treatment with HCl liberates greenish yellow gas.

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4. A constant boiling mixture which boils without any change in composition.

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5. Mixture of one part of HNO_3 and three parts of HCl.

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6. Soluble complex of silver salt with NH_4OH

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7. The type of bond present between hydrogen and chlorine in hydrogen chloride.

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8. A white compound which is insoluble in nitric acid but soluble in ammonium hydroxide.

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9. Name a substance which oxidises conc. hydrochloric acid to chlorine.

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10. An experiment to prove high solubility of ammonia.

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Worksheet 1 Fill In The Blanks

1. Hydrogen chloride is collected by ..... displacement of air.

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Worksheet 1

1. Bisulphates are formed at a temperature ..... $200^{\circ} C$.

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2. Back suction is prevented by using an ..... arrangement.

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3. Hydrogen chloride gas fumes in moist air due to its high ..... in water.

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4. ..... combines with unreactive metals like gold and platinum.

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5. Write and balance the following reactions :

Bleaching powder + Dilute Hydrochloric acid

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6. Write and balance the following reactions :

Red lead + Conc. hydrochloric acid

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7. Write and balance the following reactions :

Sodium thiosulphate + Dilute hydrochloric acid

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8. Write and balance the following reactions :

Silver chloride + Ammonium hydroxide

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9. Write and balance the following reactions :

Nitric acid + Hydrochloric acid.

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10. Complete the table given below by writing your observation:

$$\underset{(\ )}{MnO_2} + 4HCl \rightarrow MnCl_2 + 2H_2O + \underset{(\ )}{Cl_2} \uparrow$$

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11. Complete the table given below by writing your observation:

$$\underset{(\_\_\_\_\_)}{2KMnO_4} + 16HCl \rightarrow 2KCl + \underset{(\_\_\_\_\_)}{2MnCl_2} + 8H_2O + \underset{(\_\_\_\_\_)}{5Cl_2 \uparrow}$$

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12. Complete the table given below by writing your observation:

$$\underset{(\_\_\_\_\_)}{Na} + 2HCl \rightarrow NaCl + \underset{(\_\_\_\_\_)}{H_2 \uparrow}$$

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13. Complete the table given below by writing your observation:

$$\underset{(\_\_\_\_\_)}{AgNO_3} + HCl \rightarrow \underset{(\_\_\_\_\_)}{AgCl \downarrow} + HNO_3$$

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14. Complete the table given below by writing your observation:

$$\underset{\left(\underline{\quad\quad}_{\text{Insoluble}}\right)}{FeS} + 2HCl \rightarrow \underset{\left(\underline{\quad\quad}_{\text{soluble}}\right)}{FeCl_2} + H_2S$$

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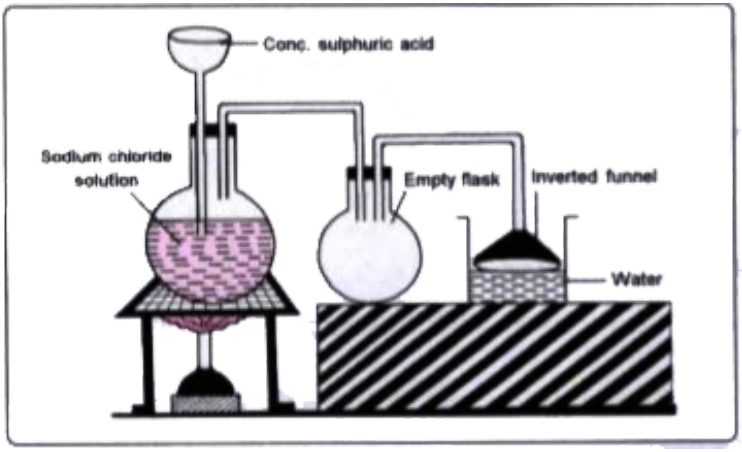
15. 

Study the phenomenon and answer the questions given below:

Name the process whose remedy is shown in the figure.

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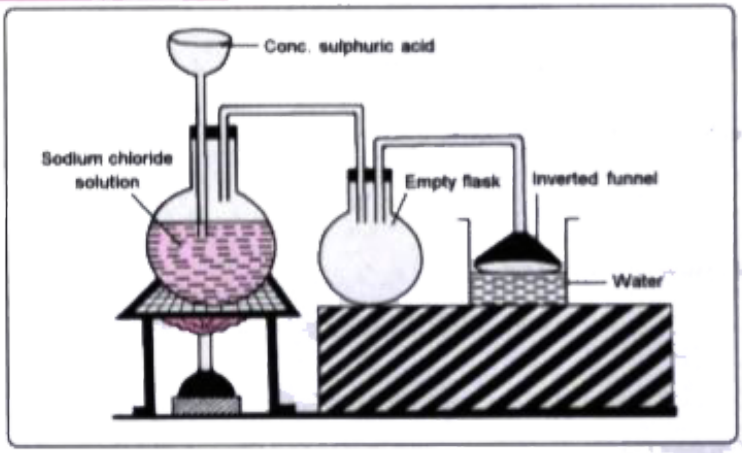
16. 

Study the phenomenon and answer the questions given below:

Why does the process take place ?

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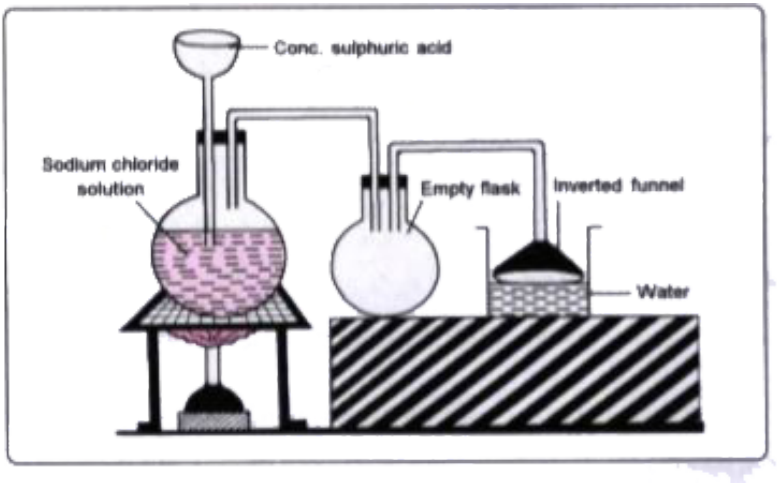

17.

Study the phenomenon and answer the questions given below:

What are the advantages of inverted funnel arrangement ?

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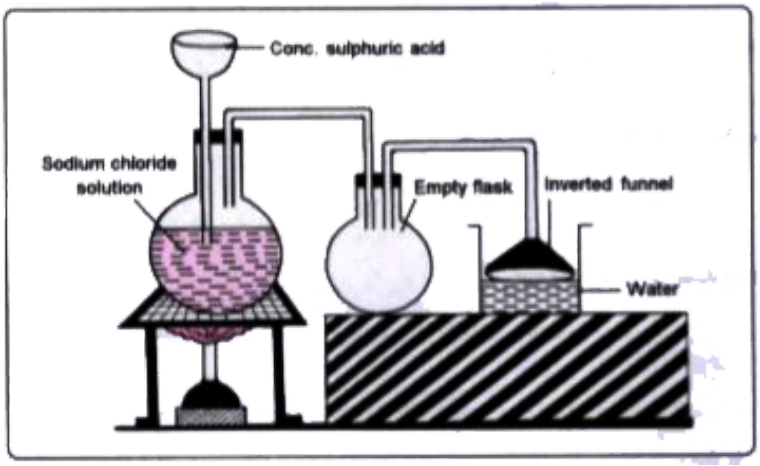
18.



Study the phenomenon and answer the questions given below:

Name two gases which show this phenomenon.

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19. State why dilute HCl cannot be concentrated beyond a certain concentration by boiling.

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20. When the stopper of a bottle full of hydrogen chloride gas is opened there are fumes in air? Explain why?

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21. Hydrogen chloride gas is not collected over water. Explain why?

Watch Video Solution

22. Calcium oxide is a very good drying agent but it is not used to dry hydrogen chloride gas. Explain why?

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23. Manganese (iv) oxide, lead (iv) oxide and red lead (Pb_3O_4) react with conc. HCI liberating chlorine.

What is the common property being shown by these metal oxides?

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24. Manganese (iv) oxide, lead (iv) oxide and red lead (Pb_3O_4) react with conc. HCI liberating chlorine.

Write the equation for the reaction of conc. HCI with Pb_3O_4

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Additional Question For Practice

1. Calcium oxide and phosphorus pentoxide are good drying agents but they are not employed to dry hydrogen chloride gas. Give reasons for each.

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2. White thick fumes are formed when a glass rod dipped in NH_4OH is brought near the mouth of a bottle full of HCl gas. Explain why ?

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3. Hydrogen chloride gas is not collected over water. Explain why?

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4. What is the purpose of using a funnel while preparing hydrochloric acid from hydrogen chloride gas?

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5. Describe briefly the method employed to dissolvehydrogen chloride gas in water as it is prepared in the laboratory

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6. Write equation for the reactions of aqueous hydrochloric acid on : magnesium foil.

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7. Write equation for the reactions of aqueous hydrochloric acid on : iron wire.

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8. Write equation for the reactions of aqueous hydrochloric acid on : copper oxide.

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9. Write equation for the reactions of aqueous hydrochloric acid on : zinc carbonate.

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10. Write equation for the reactions of aqueous hydrochloric acid on : lead nitrate solution.

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11. Write equation for the reactions of aqueous hydrochloric acid on : caustic soda solution.

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12. Write equation for the reactions of aqueous hydrochloric acid on : silver nitrate solution.

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13. Name one element which reacts with hydrogen to form a compound which is strongly acidic in water.

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14. Describe an experiment to prove that hydrogen chloride gas is (i) extremely soluble in water (ii) acidic in nature.

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15. How hydrochloric acid is obtained from hydrogen chloride gas ? Support your answer by drawing a neat diagram, stating clearly why the arrangement shown in diagram is most suitable ?

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16. How does hydrochloric acid gas (dry) react with (a) Magnesium metal (b) Aqueous silver nitrate solution (c) Lead nitrate solution (d) Ammonium hydroxide solution. Support your answer by fully balanced chemical equations.

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17. How can you prove that hydrochloric acid contain Hydrogen ?

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18. How can you prove that hydrochloric acid contain Chlorine ?

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19. Burning magnesium ribbon is taken in gas P when it form a salt R. The salt R dissolves in water and gives curdy white precipitate with silver nitrate solution. This precipitate is soluble in excess of ammonium hydroxide

solution. Name the gas P and salt R. State the chemical reaction between P and magnesium

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20. Burning magnesium ribbon is taken in gas P when it form a salt R. The salt R dissolves in water and gives curdy white precipitate with silver nitrate solution. This precipitate is soluble in excess of ammonium hydroxide solution. Name the gas P and salt R. State the chemical reaction between P and magnesium

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21. Give four uses of hydrochloric acid.

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22. What is aqua regia ? How it dissolves platinum?

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23. What is aqua regia ? How it dissolves gold?

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24. Give two chemical tests of hydrochloric acid.

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25. Why the apparatus used for the laboratory preparation of hydrogen chloride should be perfectly dry ?

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Questions From Previous Icse Board Papers

1. State one observation each for the following: Manganese dioxide is heated with conc. HCI.

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2. State one observation each for the following: Silver nitrate solution is added to dilute hydrochloric acid.

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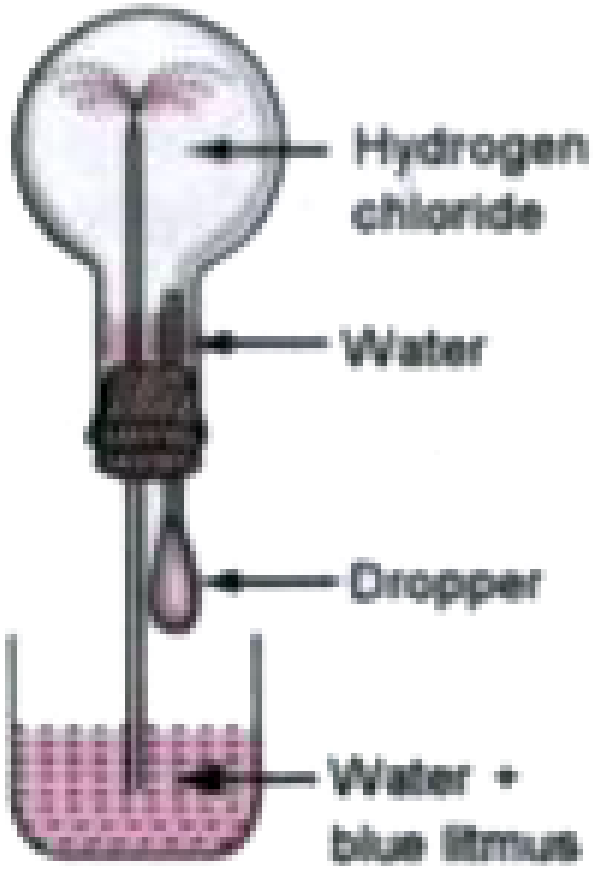
3. Name the experiment illustrated by the diagram.



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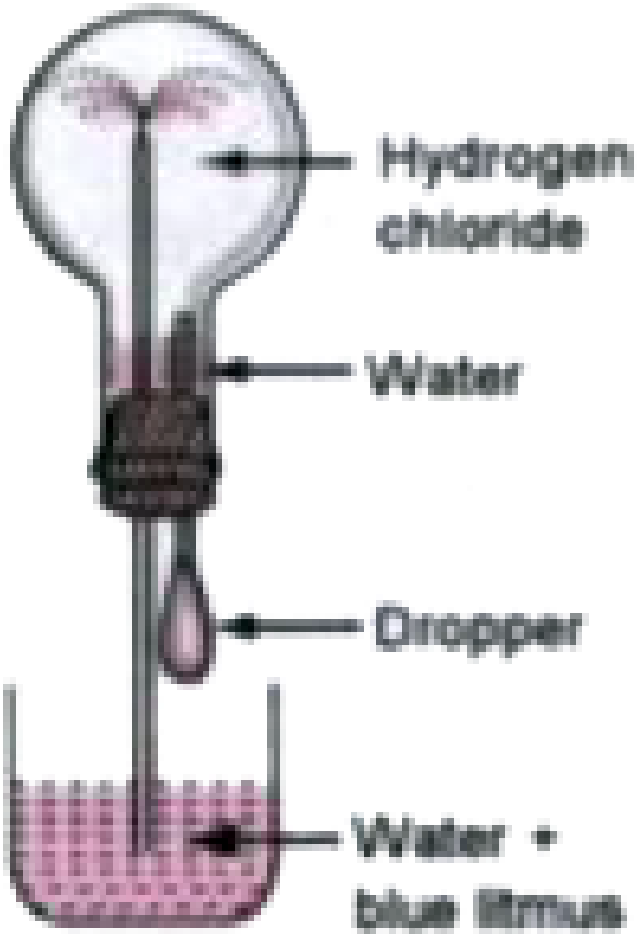
4. Which property of hydrogen chloride is demonstrated by this experiment?



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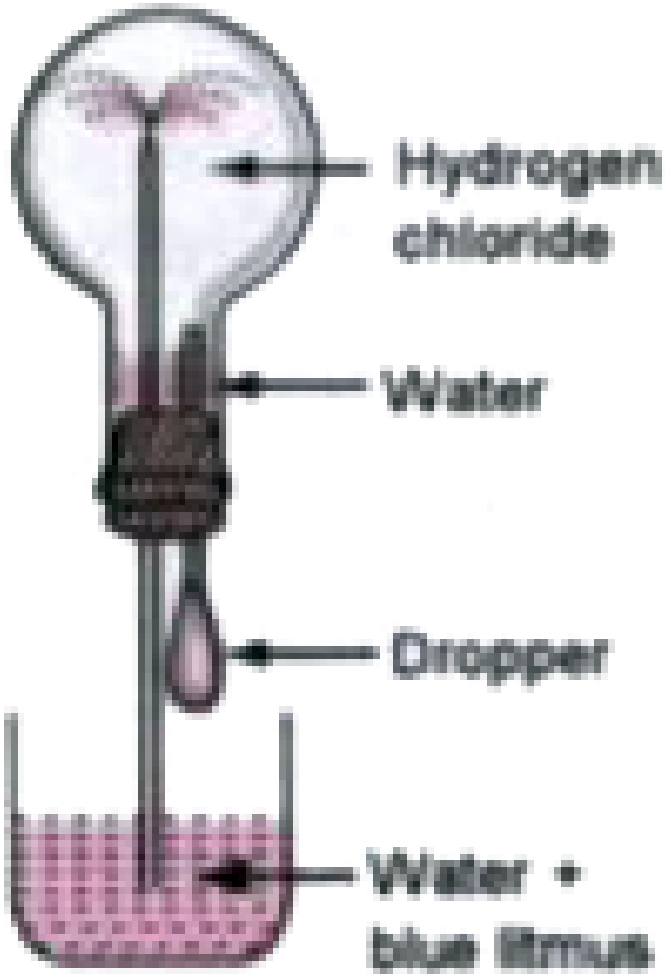
5. State the colour of water that has entered the round bottomed flask.



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6. Write balanced equations for the following reactions: copper oxide and dilute hydrochloric acid.

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7. Write balanced equations for the following reactions: manganese (IV) oxide and conc. Hydrochloric acid.

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8. Write balanced equation for the reaction of zinc and dilute hydrochloric acid.

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9. State what is observed when hydrochloric acid is added to silver nitrate solution.

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10. Name the compound which can be oxidised to chlorine.

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11. You enter a laboratory after a class has completed the Fountain Experiment. How will you be able to tell whether the gas used in the experiment was hydrogen chloride or ammonia ?

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12. Write balanced equations for the reaction of dilute hydrochloric acid with iron.

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13. Write balanced equations for the reaction of dilute hydrochloric acid with each of the following: sodium hydrogencarbonate.

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14. Write balanced equations for the reaction of dilute hydrochloric acid with each of the following: iron(II) sulphide.

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15. Write balanced equations for the reaction of dilute hydrochloric acid with each of the following: sodium sulphite.

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16. Write balanced equations for the reaction of dilute hydrochloric acid with each of the following: sodium thiosulphate solution.

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17. What property of hydrogen chloride is demonstrated when it is collected by downward delivery (upward displacement)?

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18. Why is hydrogen chloride not collected over water ?

Watch Video Solution

19. Write equations for the following:

Dilute hydrochloric acid and sodium thiosulphate.

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20. Write equations for the following:

Dilute hydrochloric acid and lead nitrate.

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21. Write a fully balanced equation for each of the following cases : Red lead is warmed with concentrated hydrochloric acid.

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22. Write a fully balanced equation for each of the following cases : Magnesium metal is treated with dilute hydrochloric acid.

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23. Correct the following statements.

For example : "Chlorine is a bleaching agent'.

Should read : 'Moist chlorine is a bleaching agent'.

Hydrochloric acid is prepared in the laboratory by passing hydrogen chloride directly through water.

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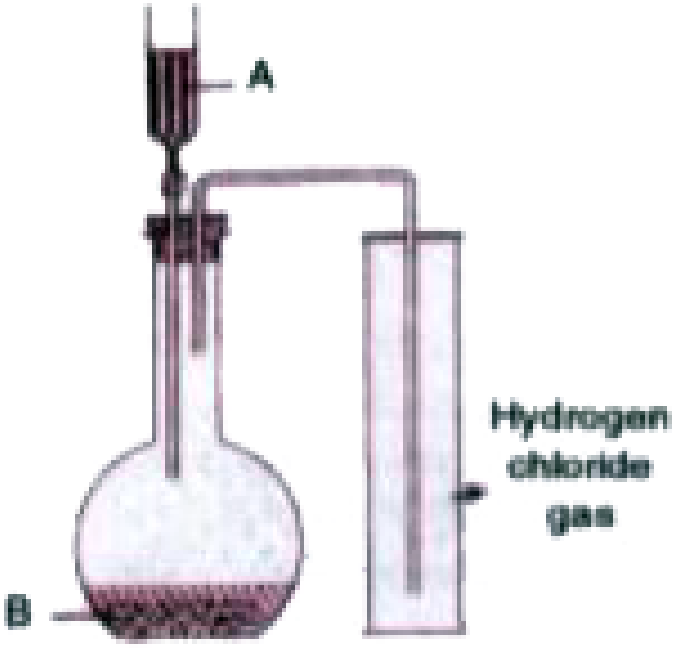
24. The diagram shows an apparatus for the laboratory preparation of hydrogen chloride.



Identify A and B.

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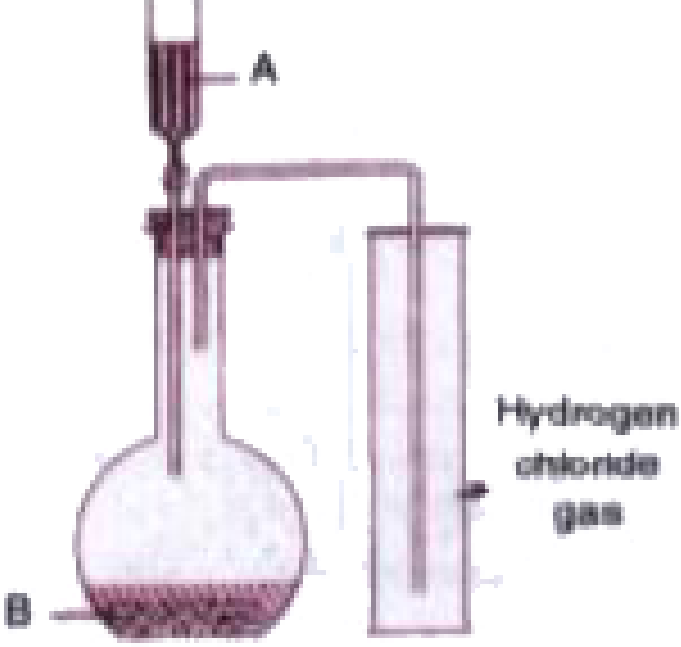
25. The diagram shows an apparatus for the laboratory preparation of hydrogen chloride.



Write the equation for the reaction.

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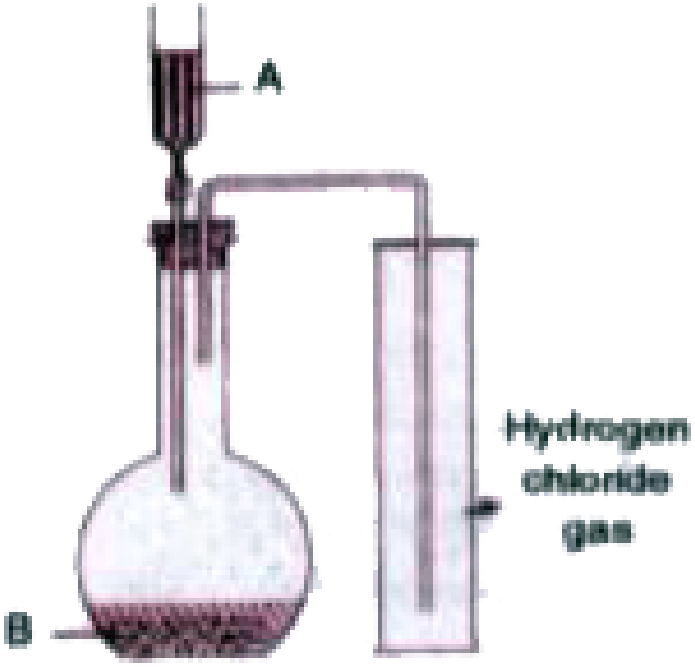
26. The diagram shows an apparatus for the laboratory preparation of hydrogen chloride.



How would you check whether or not the gas jar is filled with hydrogen chloride ?

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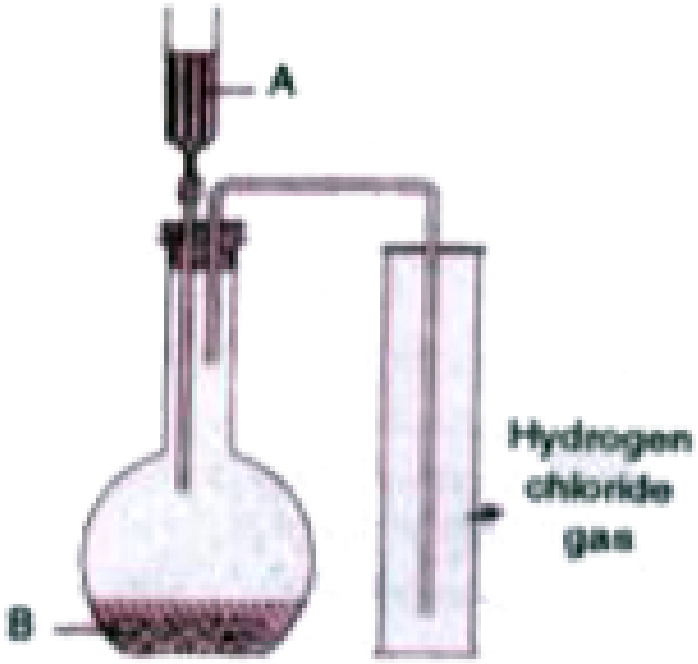
27. The diagram shows an apparatus for the laboratory preparation of hydrogen chloride.



What does the method of collection tell you about the density of hydrogen chloride ?

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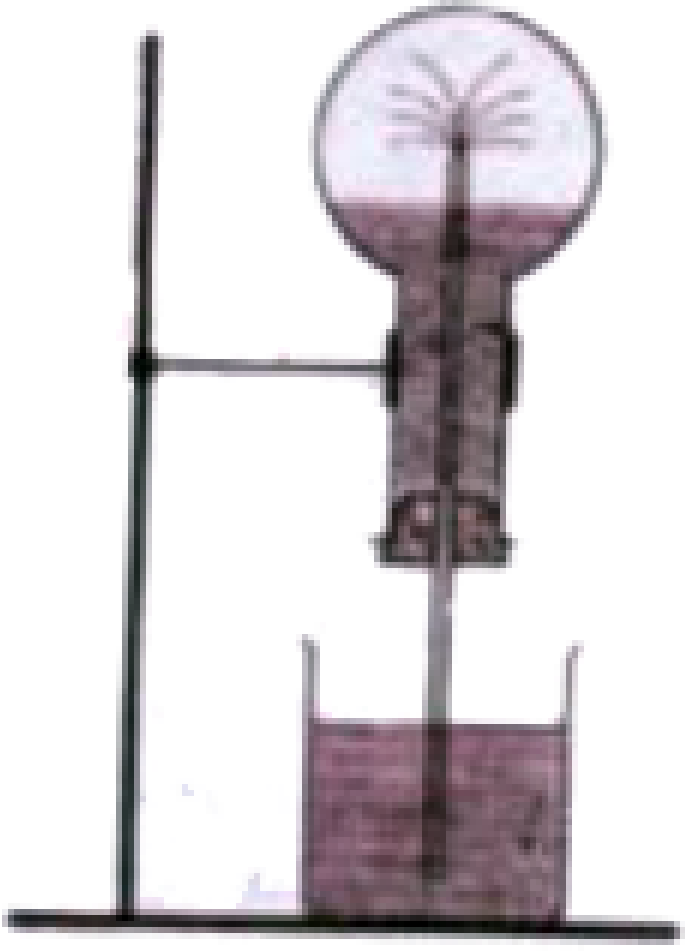
28. The diagram shows a simple arrangement of the fountain experiment:



Name the two gases you have studied which can be used in this experiment.

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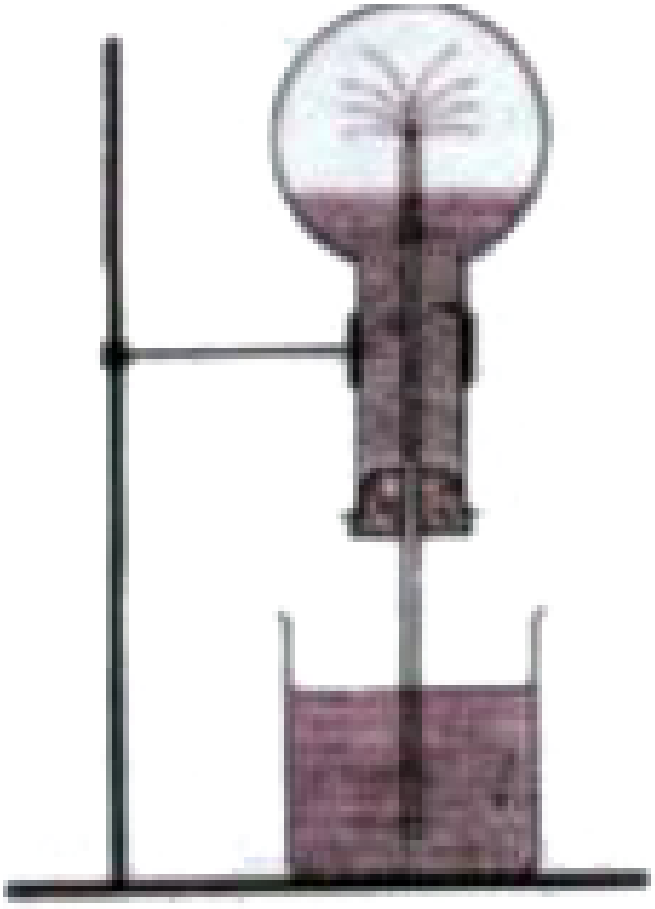
29. The diagram shows a simple arrangement of the fountain experiment:



What is the common property demonstrated by this experiment?

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30. Choose the correct answer from the options given below:

Hydrogen chloride gas being highly soluble in water is dried by:

A. a)Anhydrous calcium chloride

B. b)Phosphorus penta oxide

C. c) Quick lime

D. d)Concentrated sulphuric acid.

Answer:

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31. Write the balanced chemical equation for each of the following reactions :

Sodium thiosulphate is reacted with dilute hydrochloric acid.

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32. Write the balanced chemical equation for each of the following reactions :

Calcium bicarbonate reacts with dilute hydrochloric acid.

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33. In the laboratory preparation of hydrochloric acid, HCl gas is dissolved in water.

Draw a diagram to show the arrangement used for the absorption of HCl in water.

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34. In the laboratory preparation of hydrochloric acid, HCl gas is dissolved in water.

Why is such an arrangement necessary ? Give two reasons.

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35. In the laboratory preparation of hydrochloric acid, HCl gas is dissolved in water.

Write the chemical equations for the laboratory

preparation of HCl gas when the reactants are:

(A) below $200^\circ C$ (B) above $200^\circ C$

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36. Some word/words are missing in the following statements. You are required to rewrite the statements in the correct form using the appropriate word/words:

Aqua regia contains one part by volume of nitric acid and three parts by volume of hydrochloric acid.

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37. Give reason for the following:

Hydrogen chloride gas cannot be dried over quick lime.

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38. Give Balanced equations for the following

(i)Silver nitrate solution and Sodium chloride solution.

(ii)Concentrated hydrochloric acid and Potassium permanganate solution.

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39. Silver nitrate solution and Sodium chloride solution.

Silver nitrate solution and Sodium chloride solution.

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40. Identify the anion present in the following compound :

Compound L on reacting with Barium chloride solution gives a white precipitate insoluble in dilute hydrochloric acid or dilute nitric acid.

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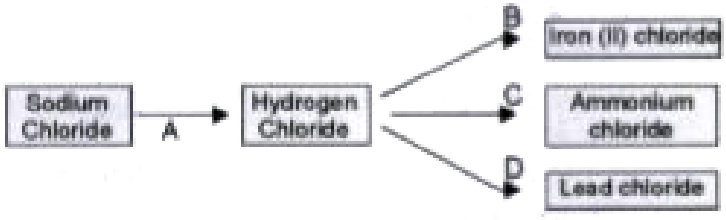
41. Refer to the flow chart diagram below and give balanced equations with conditions, if any, for the following conversions A to D.



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42. Identify the gas evolved in the following reactions when

:

potassium sulphite is treated with dilute hydrochloric acid.

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43. Identify the gas evolved in the following reactions when

:

concentrated hydrochloric acid is made to react with manganese dioxide.

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44. State one appropriate observation for each of the following:

A few drops of dilute hydrochloric acid are added to silver nitrate solution, followed by addition of ammonium hydroxide solution.

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45. Give a chemical test to distinguish between the following pairs of chemicals:

Sodium chloride solution and Sodium nitrate solution.

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46. Give a chemical test to distinguish between the following pairs of compounds:

Hydrogen chloride gas and hydrogen sulphide gas.

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47. Identify the following substance :

A gas which does not conduct electricity in the liquid state but conducts electricity when dissolved in water.

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48. Fill in the blank from the choices given within bracket:

Quicklime is not used to dry HCI gas because ..... (CaO is

alkaline, CaO is acidic, CaO is neutral)

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49. Write balanced equation for the following:

(i) Action of dilute hydrochloric acid on sodium sulphide.

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50. State your observation in each of the following cases :

(i) When dilute hydrochloric acid is added to sodium carbonate crystals.

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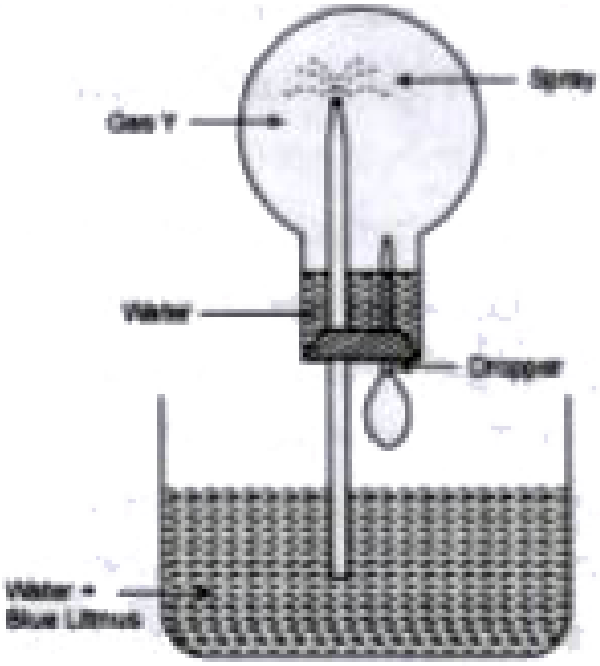
51. Study the figure given below and answer the questions that follow :



Identify the gas Y.

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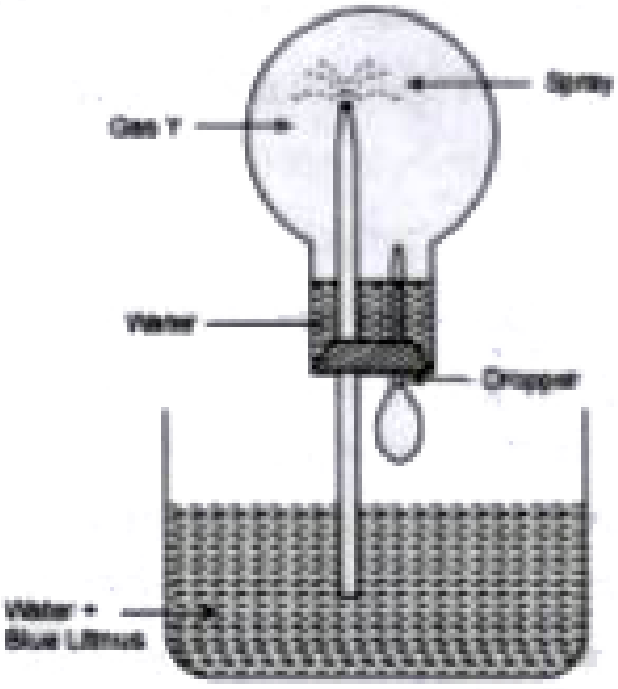
52. Study the figure given below and answer the questions that follow :



What property of gas Y does this experiment demonstrate ?

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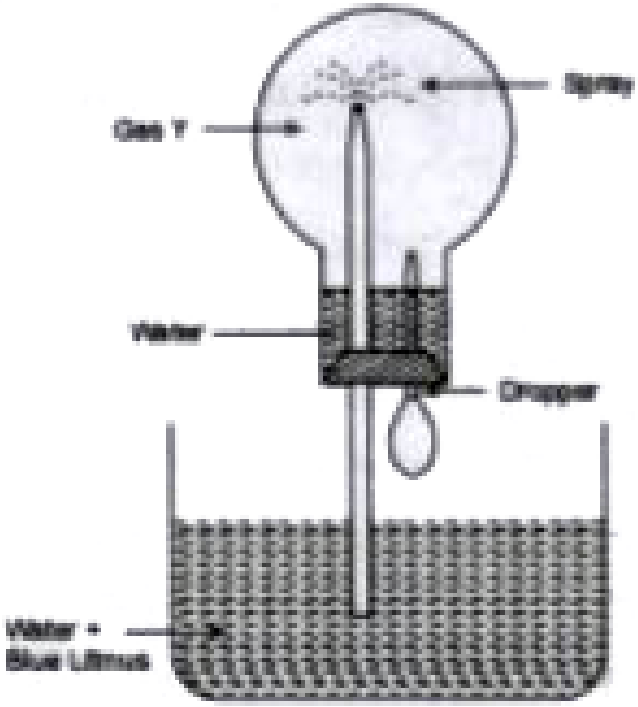
53. Study the figure given below and answer the questions that follow :



Name another gas which has the same property and can be demonstrated through this experiment.

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54. Select from the list the gas that matches the description given in each case :

[ammonia, ethane, hydrogen chloride, hydrogen sulphide, ethyne]

This gas produces dense white fumes with ammonia gas.

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55. Identify the acid which matches the following description (i) to (v):

The acid on mixing with silver nitrate solution produces a white precipitate which is soluble in excess ammonium hydroxide.

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56. The following questions are pertaining to the laboratory preparation of hydrogen chloride gas :

Write the equation for its preparation mentioning the condition required.

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57. The following questions are pertaining to the laboratory preparation of hydrogen chloride gas :

Name the drying agent used and justify your choice.

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58. The following questions are pertaining to the laboratory preparation of hydrogen chloride gas :

State a safety precaution you would take during the preparation of hydrochloric acid.

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59. Choose the correct answer from the options given below:

(i) The aim of the Fountain Experiment is to prove that:

A. HCl tums blue litmus red

B. HCl is denser than air

C. HCI is highly soluble in water

D. HCl fumes in moist air.

Answer:

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60. Write the balanced chemical equation for the following:

(1) Action of Hydrochloric acid on sodium bicarbonate.

(2) Identify the gas evolved and give the chemical test in each of the following cases : Dilute Hydrochloric acid is added to Lead nitrate solution and the mixture is heated.

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61. Write the balanced chemical equation for the following:

(1) Action of Hydrochloric acid on sodium bicarbonate.

(2) Identify the gas evolved and give the chemical test in each of the following cases : Dilute Hydrochloric acid is added to Copper carbonate.

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62. Write the balanced chemical equation for the following:

(1) Action of Hydrochloric acid on sodium bicarbonate.

(2) Dilute Hydrochloric acid is added to Sodium thiosulphate.

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63. State your observations when :

Dilute hydrochloric acid reacts with sodium sulphite.

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64. State your observations when :

Dilute hydrochloric acid reacts with iron (II) sulphide.

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65. State one relevant observation for the following reaction :

Action of dilute Hydrochloric acid on iron (II) sulphide.

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66. Certain blank spaces are left in the following table and these are labelled as A, B and C. Identify each of them.

Lab preparation of	Reactants used	Products formed	Drying agent	Method of collection
NH_3 gas	A	$Mg(OH)_2NH_3$	B	C

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67. Write a balanced chemical equation for the following:

of dilute hydrochloric acid on magnesium sulphite.

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68. State one relevant observation for the following:

Lead nitrate solution is mixed with dilute hydrochloric acid and heated.

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69. Name the gas that is produced in the following case :

Action of dilute hydrochloric acid on sodium sulphide.

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70. Fill up the blank with the correct choice given in bracket.

Dry hydrogen chloride gas can be collected by _____displacement of air. (downward/upward)

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71. Name the acid used for the preparation of hydrogen chloride gas in the laboratory. Why is this particular acid preferred to other acids?

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72. Write the balanced chemical equation for the laboratory preparation of hydrogen chloride gas.

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73. For the preparation of hydrochloric acid in the laboratory :

Why is direct absorption of hydrogen chloride gas in water not feasible ?

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74. For the preparation of hydrochloric acid in the laboratory 0=- I] State why direct absorption of hydrogen gas in water is not feasible . Ii] State what arrangement is used to dissolve hydrogen chloride gas in water.

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