



## CHEMISTRY

### BOOKS - VK GLOBAL PUBLICATION CHEMISTRY (HINGLISH)

#### ACIDS, BASES AND SALTS

##### Ncert Intext Questions

1. You have been provided with three test tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution, respectively. If you are given only red litmus paper, how will you identify the contents of each test tube?



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2. Why should curd and sour substances not be kept in brass and copper vessels?

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3. Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example. How will you test for the presence of this gas?

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4. Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is calcium chloride.

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5. Why do HCl,  $HNO_3$ , etc., show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character?

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6. Why does an aqueous solution of an acid conduct electricity?

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7. Why does dry HCl gas not change the colour of the dry litmus paper?

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8. While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?

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9. How is the concentration of hydronium ions ( $H_3O^+$ ) affected when a solution of an acid is diluted?

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10. How is the concentration of hydroxide ions ( $OH^-$ ) affected when excess base is dissolved in a solution of sodium hydroxide?

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11. You have two solutions, A and B. The pH of solution A is 6 and pH of solution B is 8. Which solution has more hydrogen ion concentration? Which of this is acidic and which one is basic?

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12. What effect does the concentration of  $H^+(aq)$  ions have on the nature of the solution?

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13. Do basic solutions also have  $H^+(aq)$  ions? If yes, then why are these basic?

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14. Under what soil condition do you think a farmer would treat the soil of his fields with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate)?

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15. What is the common name of the compound  $CaOCl_2$ ?



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16. Name the substance which on treatment with chlorine yields bleaching powder.

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17. Name the sodium compound which is used for softening hard water.

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18. What will happen if a solution of sodium hydrocarbonate is heated?  
Give the equation of the reaction involved.

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19. Write an equation to show the reaction between Plaster of Paris and water

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## Ncert Exercises

1. A solution turns red litmus blue, its pH is likely to be

- A. 1
- B. 4
- C. 5
- D. 10

**Answer: D**

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2. A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains

A. NaCl

B. HCl

C. LiCl

D. KCl

**Answer: B**



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3. 10 mL of a solution of NaOH is found to be completely neutralised by 8 mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount HCl solution (the same solution as before) required to neutralise it will be

A. 4 mL

B. 8 mL



C. 12 mL

D. 16 mL

**Answer: D**



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4. Which one of the following types of medicines is used for treating indigestion?

A. Antibiotic

B. Analgesic

C. Antacid

D. Antiseptic

**Answer: C**



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5. Write word equations and then balanced equations for the reactions taking place when:

(a). Dilute sulphuric acid reacts with zinc granules.

(b). Dilute hydrochloric acid reacts with magnesium ribbon.

(c). Dilute sulphuric acid reacts with aluminium powder.

(d). dilute hydrochloric acid reacts with iron filings.

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6. Compounds such as alcohols and glucose also contain hydrogen but are not categorised as acids. Describe an Activity to prove it.

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7. Why does distilled water not conduct electricity, whereas rain water does?

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8. Why do acids not show acidic behaviour in the absence of water?

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9. Five solutions A,B,C,D and E when tested with universal indicator showed pH as 4,1,11,7 and 9, respectively. Which solution is

(a) neutral?

(b) strongly alkaline?

(c) strongly acidic?

(d) weakly acidic?

(e) weakly alkaline?

Arrange the pH in increasing order of hydrogen-ion concentration.

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10. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid ( $CH_3COOH$ ) is added to test tube B. Amount and concentration taken

for both the acids are same. In which test tube will the fizzing occur more vigorously and why?

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**11.** Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd? Explain your answer.

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**12.** A milkman adds a very small amount of baking soda to fresh milk.

(a) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?

(b) Why does this milk take a long time to set as curd?

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**13.** Plaster of Paris should be stored in a moisture-proof container. Explain why?

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14. What is neutralisation reaction ? Give two examples of such type of reactions.

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15. Give two important uses of washing soda and baking soda.

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### Very Short Answer Questions 1 Mark

1. Name the acid present in vinegar.

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2. Two solutions A and B have pH values of 5 and 8 respectively . Which solution will be basic in nature ?

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3. If a few drops of a concentrated acid accidentally spill over the hand of a student, what should be done ?

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4. If someone is suffering from the problem of acidity after overeating, which of the following would you suggest as remedy?

Lemon juice, Vinegar, Baking soda solution

Give reason for your choice.

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5. Arrange the following in the increasing order of acidic strength.

Acetic acid, water and hydrochloric acid.

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6. Why does tooth decay start when the pH of mouth is lower than 5.5?

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7. Two solutions A and B have pH values of 3.0 and 9.5 respectively. Which of these will turn litmus solution from blue to red and which will turn phenolphthalein from colourless to pink?

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8. A knife, which is used to cut a fruit, was immediately dipped into water containing drops of blue litmus solution. If the colour of the solution is

changed to red, what inference can be drawn about the nature of the fruit and why ?

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9. Explain why an aqueous solution of ammonium chloride is acidic in nature .

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10. What are the products formed when an acid reacts with a base ?

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11. Fresh milk has a pH of 6. When it changes into curd (yogurt) , will its pH value increase or decrease ? Why ?

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12. A white chemical compound becomes hard on mixing with proper quantity of water. It is also used in surgery to maintain joints in a fixed position. Name the chemical compound.

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13. Which one of these has a higher concentration of  $H^+$  ions ?

$1M HCl$  or  $1M CH_3COOH$ .

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14. In addition to sodium hydrogencarbonate, bakings powder contains a substance 'X'. Name the substance 'X'.

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15. What is the commercial name of calcium sulphate hemihydrate?

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16. Name the substance obtained by the action of chlorine on dry slaked lime .

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17. How many molecules of water of crystallisation are there in  
(i) Plaster of Paris (ii) washing soda crystals ?

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18. Why does the milky appearance disappear on passing excess of carbon dioxide to lime water ?

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19. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solutions would reverse the change ?

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20. (a). What happens when concentrated solution of sodium chloride (brine) is electrolysed? Write the equation of the reaction involved.

(b) Why is the electrolysis of a concentrated solution of sodium chloride known as chlor-alkali process?

(c) Name three products of the chlor-alkali process. State two uses of each of these products.

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### Short Answer Questions | 2 Marks

1. What is an olfactory indicator? Name two olfactory indicators. What is the effect of adding sodium hydroxide solution to these olfactory

indicators?

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2. List in tabular form two differences between acquired traits and inherited traits

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3. What happens when a cold and concentrated solution of sodium chloride reacts with ammonia and carbon dioxide? Write the chemical equation of the reaction which takes place.

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4. Name the gas evolved when dilute HCl reacts with sodium hydrogencarbonate. How is it recognised?

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5. The pH of soil A is 7.5 while that of soil B is 4.5. Which of the two soils, A or B, should be treated powdered chalk to adjust its pH and why?

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6. What is 'baking powder' ? How does it make the cake soft and spongy ?

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7. The conditions preferred by some plants are shown in the table below :

Plant	Apple	Potato	Black currant	Mint	Onion	Strawb
<i>pH</i>	5.0 – 6.5	4.5 – 6.0	6.0 – 8.0	7.0 – 8.0	6.0 – 7.0	5.0 – 7

(a) Which plants grow well over the largest range of pH values ?

(b) Which plant can grow in the most acidic soil ?

(c) Which plant can grow in the basic soil only ?

(d) What is the pH range for onion to grow well ?

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8. (i) Name the products formed when sodium hydrogencarbonate is heated.

(ii) Write the chemical equation for the reaction involved in it.

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9. Name the acid present in ant sting and give its chemical formula. Also give the common method to get relief from the discomfort caused by the ant sting.

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10. What happens when nitric acid is added to egg shell ?

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1. When zinc metal is treated with a dilute solution of a strong acid, a gas is evolved which is utilised in the hydrogenation of oil. Name the gas evolved . Write the chemical equation of the reaction involved and also wrote a test to detect the gas formed.

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2. Which acid is produced in our stomach ? What happens if there is an excess of acid in the stomach? How can its effect be cured?

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3. To the three solutions listed below, a few drops of phenolphthalein and blue litmus were added separately . Specify the colour in each case, if any

:

Name of the solution	Colour change with phenolphthalein	Colour change with blue litmus
(a) Sodium carbonate		
(b) Hydrochloric acid		
(c) Sodium chloride		

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4. A salt X when dissolved in distilled water gives a clear solution which turns red litmus blue. Explain the phenomenon.

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5. With the help of a chemical equation, explain how a soda - acid fire extinguisher helps in putting out a fire.

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6. A compound X which is prepared from gypsum has the property of hardening when mixed with a proper quantity of water.

(a) Identify the compound X

(b) Write the chemical equation for its preparation

(c) For what purpose is it used in hospitals?

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7. What is meant by water of crystallisation ? Explain that the crystalline salts contain water of crystallisation.

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8. (i) Write the formula and chemical name of bleaching powder.

(ii) Write chemical equation to represent the action of atmospheric  $CO_2$  gas on bleaching powder when left exposed in open.

(iii) State for what purpose is bleaching powder used in water treatment plants.

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9. How would you distinguish between baking powder and washing soda by heating ?

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10. Salt A commonly used in bakery products on heating gets converted into another salt B which itself used for removal of hardness of water and a gas C is evolved. The gas C when passed through lime water, turns it milky . Identify A,B and C.

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11. What are strong and weak acids? In the following list of acids separate strong acids from weak acids . Hydrochloric acid, citric acid , acetic acid, nitric acid formic acid , sulphuric acid.

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12. What happens when dilute hydrochloric acid is added to the following and write balanced chemical equations

(i) Bleaching powder

(ii) Zinc granules

(iii) Baking soda

**13.** Give suitable reason for the following statements :

- (i) We feel burning sensation in the stomach when we overeat.
- (ii) The crystals of washing soda change to white powder on exposure to air.
- (iii) An aqueous solution of sodium chloride is neutral but an aqueous solution of sodium carbonate is basic .

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### Long Answer Questions 5 Marks

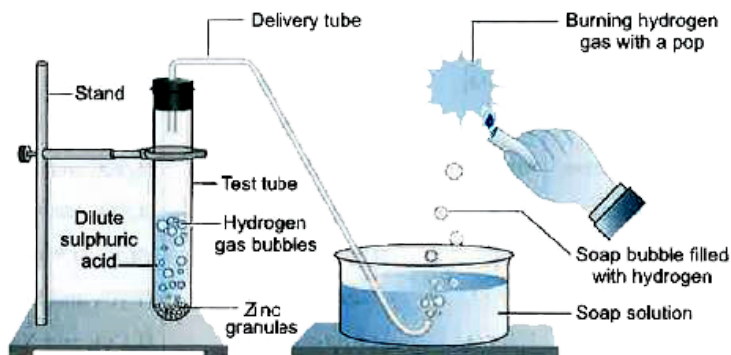
1. (i) In the following schematic diagram for the preparation of hydrogen gas as shown in figure , what would happen if following changes are made ?

(a) In place of zinc granules , same amount of zinc dust is taken in the test tube .

(b) Instead of dilute sulphuric acid , dilute hydrochloric acid is taken .

(c) Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated .

(ii) How do metal carbonates and metal hydrogencarbonates react with acids ?



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2. A metal carbonate X on reacting with an acid gives a gas which when passed through a solution Y gives the carbonate back. On the other hand, a gas G that is obtained at anode during electrolysis of brine is passed on dry, it gives a compound Z, used for disinfecting drinking water . Identify X,Y,G and Z.

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3. Write the formulae of the salts given below :

Potassium sulphate , sodium sulphate , calcium sulphate , magnesium sulphate , copper sulphate , sodium chloride , sodium nitrate , sodium carbonate and ammonium chloride.

Identify the acids and bases from which the above salts may be obtained .

How many families can you identify among these salts ?

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4. A sulphate salt of group 2 element of the periodic tables is a white soft substance which can be moulded in to different shapes by making its dough. When this compound is left in open for some time, it becomes a solid mass and cannot be used for moulding purposes . Identify the sulphates salt and why does it show such a behaviour ? Give the reaction involved .

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1. Why is acetic acid called a weak acid though there are four hydrogen atoms in the molecule ?



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2. In one of the industrial processes for manufacture of sodium hydroxide a gas x is formed as by product .The gas x reacts with lime water to give a compound y which used as a bleaching agent in chemical industry. Identify x and y giving the chemical equation of the reactions involved



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3. A person found that the cake prepared by him is hard and small in size. Which ingredient has he forgotten to add that would have caused to cake to rise and become light/ Explain your answer.



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4. A dry pellet of a common base B, When kept in open absorbs moisture and turns sticky. The compound is also a by product of chloroalkali process . Identify B, what type of reaction occurs when B is treated with an acidic oxide? Write a balanced chemical equation for one such solution

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5. A compound 'A' is used in fire extinguishers , as an antacid and its small amount is also used in making bakery items. Identify the compound and also explain the reason for above mentioned uses of the compound 'A'.

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Proficiency Exercise Very Short Answer Questions 1 Mark

1. What are indicators ? Give two examples each of natural and artificial indicators.

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2. Write the common name of  $CaOCl_2$ .

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3. Name the gas evolved when NaOH reacts with zinc.

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4. Which is a stronger acid - a solution with pH 6 or a solution with pH 3?

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5. Name the acid present in an ant sting.

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6. Aqueous solution of an acid conducts electricity . Give reason.

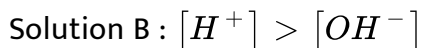
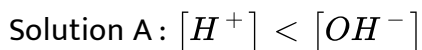
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### Proficiency Exercise Short Answer Questions 2 Mark

1. Effervescences are formed when the batter for cake is heated . Which substance is present in batter ? Name the gas evolved. Write the chemical equation involved.

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2. Classify the following given solution A and B as acidic or basic, giving reason.



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3. While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?

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4. Write the name and formula of each of the following

(a) an acidic salt

(b) a basic salt.

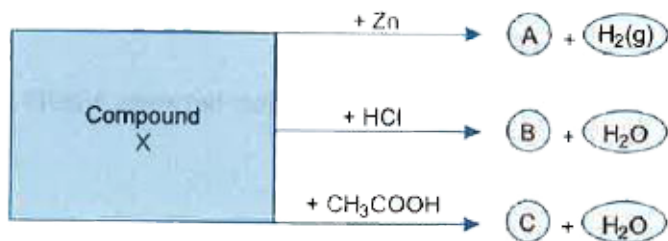
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1. What are the products formed when an acid reacts with a base ? What is the type of reaction ? Give one example and name the salt obtained.

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2. Identify the compound X on the basis of the reactions given below.

Also, write the name and chemical formulae of A, B and C.



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3. A gas X reacts with lime water and forms a compound Y which is used as a bleaching agent in chemical industry. Identify X and Y . Give the

chemical equation of the reaction involved.

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4. (a) a solution has a pH of 7. Explain how you would you :

(i) increase its pH (ii) decreases its pH

(b) If a solution the colour of the litmus from red to blue, what can you say about its pH ?

(c ) What can you say about the pH of a solution that liberates carbon dioxide from sodium carbonate ?

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5. Fill in the missing data in the given table :

Name of the Salt	Formula	Salt obtained from	
		Base	Acid
(i) Ammonium chloride	$\text{NH}_4\text{Cl}$	$\text{NH}_4\text{OH}$	—
(ii) Copper sulphate	—	—	$\text{H}_2\text{SO}_4$
(iii) Sodium chloride	$\text{NaCl}$	$\text{NaOH}$	—
(iv) Magnesium nitrate	$\text{Mg}(\text{NO}_3)_2$	—	$\text{HNO}_3$
(v) Potassium sulphate	$\text{K}_2\text{SO}_4$	—	—
(vi) Calcium nitrate	$\text{Ca}(\text{NO}_3)_2$	$\text{Ca}(\text{OH})_2$	—

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## Proficiency Exercise Long Answer Questions 5 Mark

1. (a) You are provided with three test tubes A,B,C which contain distilled water , acidic and basic solutions . If you are given blue litmus paper only , how will you identify the nature of the solutions in three tubes?

(b) How will you prove that a given salt is a carbonate of a metal ?

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2. (a) For each of the compound A and B , suggest a suitable method of its preparation with the balanced chemical equations.

(i) A is bleaching powder. (ii) B is gypsum

(b) Mention two uses of bleaching powder.

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3. A compound 'X' is bitter to taste. It is a compound of washing powder and reacts with dilute HCl to produce brisk effervescence due to a colourless and odourless gas 'Y' which turns lime water milky due to the formation of 'Z' when excess of  $CO_2$  is passed, milkiness disappears due to formation of 'P'. Identify 'X' , 'Y' , 'Z' and 'P' . Write the equations involved in the formation of Y, Z and P .

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4. For making cake, baking powder is taken. If at home your mother uses baking soda instead of baking powder in cake.

- (a) How will it affect the taste of the cake and why?
- (b) How can baking soda be converted in to baking powder ?
- (c) What is the role of tartaric acid added to baking soda?

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