

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

- (a) 1
(b) 4
(c) 5
(d) 10.

Ans. (b)

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.

Ans. (b)

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 neutralize it will be

- (a) 4 mL
(b) 8 mL
(c) 12 mL
(d) 16 mL

Ans. (d)

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

- (a) Antibiotic
(b) Analgesic
(c) Antacid
(d) Antiseptic

Ans. (c)

5. Write word equations and then balanced equations for the reaction 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.

Ans. (a) $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

(b) $Mg + 2HCl \longrightarrow MgCl_2 + H_2$

(c) $2Al + 3H_2SO_4 \longrightarrow Al_2(SO_4)_3 + 3H_2$

(d) $Fe + 2HCl \longrightarrow FeCl_2 + H_2$

6. Compounds such as alcohol and glucose also contain hydrogen but are not categorized as acids.

Describe an activity to prove it.

Ans. These do not ionise to give hydrogen ions (H^+). Therefore, these are not regarded as acids. Since these do not ionise, they do not conduct electricity. Refer activity 3.

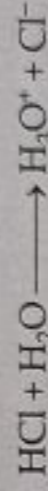
7. Why does distilled water not conduct electricity, whereas rain water does?

Ans. Pure distilled water is not a good conductor

of electricity because it is weak electrolyte and dissociates only slightly to give H^+ and OH^- ions. However, rain water contains acidic impurities. Since acids are good conductors of electricity, rain water conducts electricity.

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

Ans. Acids ionise only in the presence of water to give ions.



However, in the absence of water, acids do not ionise to give H_3O^+ ions and therefore, do not behave as acids.

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.

Ans. (a) D (b) C
(c) B (d) A
(e) E

Increasing order of hydrogen ion concentration:

$$11 < 9 < 7 < 4 < 1$$

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. In which test tube will the fizzing occur more vigorously and why?

Ans. In test tube A because HCl is stronger acid than acetic acid and therefore, reacts faster with magnesium ribbon.

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

Ans. Curd is sour in taste and becomes acidic. Therefore, its pH will decrease from pH of 6 to a lower value.

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?

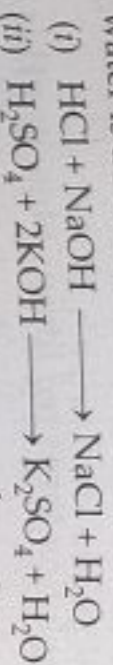
Ans. (a) The milkman adds baking soda to milk so that the milk becomes slightly alkaline. Thus, milk will not be converted to acidic curd readily.
 (b) This milk take a longer time to set to curd because it is alkaline and takes longer time for bacteria to make it acidic.

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

Ans. Plaster of Paris in contact with moisture (water) changes to solid hard mass, gypsum. Therefore, its gets wasted. Hence it should be stored in a moisture proof containers.

14. What is a neutralization reaction? Give two examples.

Ans. The reaction of an acid and a base to form salt and water is a neutralization reaction. For example,



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

Ans. **Washing soda**

1. It is used for softening of hard water.
2. It is used for the manufacture of soap, glass, paper, borax, caustic soda, etc.

Baking soda

1. Baking soda is mainly used in the preparation of baking powder. Baking powder contains sodium hydrogen carbonate and an acid like tartaric acid or citric acid.
2. Baking soda is used in medicines as an antacid. It is used in medicines to remove acidity of the stomach. Therefore, it is an important constituent of an antacid.

NCERT Exemplar Problems

Note: Multiple Choice Question (1-30) from Exemplar Problems are given Competition File, Page 132

> Short Answer Questions <

31. Match the acids given in Column (A) with their correct source given in Column (B)

Column (A)	Column (B)
(a) Lactic acid	(i) Tomato
(b) Acetic acid	(ii) Lemon
(c) Citric acid	(iii) Vinegar
(d) Oxalic acid	(iv) Curd

Ans. (a)-(iv); (b)-(iii); (c)-(ii); (d)-(i)

32. Match the important chemicals given in Column (A) with the chemical formulae given in Column (B)

Column (A)	Column (B)
(a) Plaster of Paris	(i) $\text{Ca}(\text{OH})_2$
(b) Gypsum	(ii) $\text{CaSO}_4 \cdot 1/2 \text{H}_2\text{O}$
(c) Bleaching Powder	(iii) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
(d) Slaked Lime	(iv) CaOCl_2

Ans. (a)-(ii); (b)-(iii); (c)-(iv); (d)-(i)

33. What will be the action of the following substances on litmus paper?
 Dry HCl gas, moistened NH_3 gas, lemon juice, carbonated soft drink, curd, soap solution.

Ans.

Substance	Action on litmus paper
Dry HCl gas	No action
Moistened NH_3 gas	Turns red litmus blue
Lemon juice	Turns blue litmus red
Carbonated soft drink	Turns blue litmus red
Curd	Turns blue litmus red
Soap solution	Turns red litmus blue

34. 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.

Ans.

The acid present in ant sting is methanoic acid or formic acid. Its chemical formula is HCOOH . To get relief from discomfort caused by it, apply basic salt such as baking soda (NaHCO_3) on it.

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

Ans.

Egg shells contain calcium carbonate (CaCO_3). When nitric acid is added to it, calcium carbonate reacts with it evolving carbon dioxide.



36. A student prepared solutions of (i) an acid and (ii) a base in two separate beakers. He forgot to label the solutions and litmus paper is not available in the laboratory. Since both the solutions are colourless, how will the distinguish between the two?

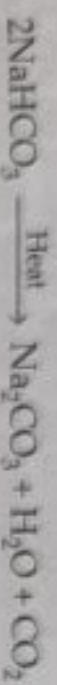
Ans. Transfer a portion of these solutions to two glass tubes. Add one or two drops of phenolphthalein indicator to these solutions.

The solution which remains colourless will be acid solution.

The solution which becomes pink will be basic solution.

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

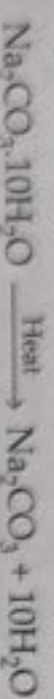
Ans. Baking soda is sodium hydrogen carbonate, NaHCO_3 . On heating it gives CO_2 gas which turns lime water milky.



Baking soda

Washing soda is sodium carbonate $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

Upon heating, it will not liberate CO_2 gas.



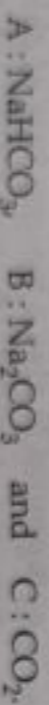
Washing soda

38. Salt A commonly used in bakery products on heating gets converted into another salt B which itself is 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.

(CBSE Sample Paper 2010)

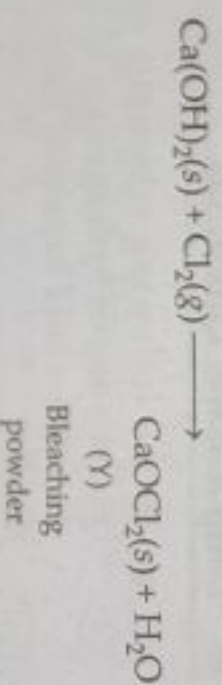
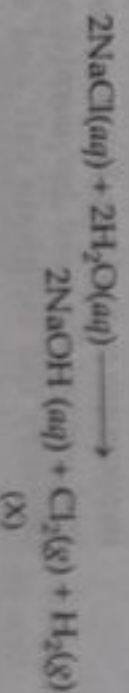
Ans. Salt A is baking soda (NaHCO_3) which is commonly used in bakery products. Upon heating it changes to sodium carbonate (salt B) and CO_2 gas (C) is evolved. Salt B i.e. sodium carbonate is used for removing hardness of water. CO_2 gas (C) turns lime water milky.

Thus:



39. In one of the industrial processes used 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 is used as a bleaching agent in chemical industry. Identify X and Y giving the chemical equations of the reactions involved.

Ans. In the manufacture of sodium hydroxide (NaOH) by the electrolysis of sodium chloride (called brine), hydrogen gas and chlorine gas(X) are formed as by products. When gas (X) reacts with lime water, it forms calcium oxychloride (bleaching powder), Y. The reactions are:



40. Fill in the missing data in the following table:

Name of the salt	Salt obtained from		
	Formula	Base	Acid
(i) Ammonium chloride	NH_4Cl	NH_4OH	—
(ii) Copper sulphate	—	—	H_2SO_4
(iii) Sodium chloride	NaCl	NaOH	—
(iv) Magnesium nitrate	$\text{Mg}(\text{NO}_3)_2$	—	HNO_3
(v) Potassium sulphate	K_2SO_4	—	—
(vi) Calcium nitrate	$\text{Ca}(\text{NO}_3)_2$	$\text{Ca}(\text{OH})_2$	—

Ans.

Name of the salt	Salt obtained from		
	Formula	Base	Acid
(i) Ammonium chloride	NH_4Cl	NH_4OH	HCl
(ii) Copper sulphate	CuSO_4	$\text{Cu}(\text{OH})_2$	H_2SO_4
(iii) Sodium chloride	NaCl	NaOH	HCl
(iv) Magnesium nitrate	$\text{Mg}(\text{NO}_3)_2$	$\text{Mg}(\text{OH})_2$	HNO_3
(v) Potassium sulphate	K_2SO_4	KOH	H_2SO_4
(vi) Calcium nitrate	$\text{Ca}(\text{NO}_3)_2$	$\text{Ca}(\text{OH})_2$	HNO_3

41. 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.

Ans. Strong acids are those which ionise completely in their aqueous solutions and give hydronium ions.

Weak acids are those which are partially ionised in their aqueous solutions:

Strong acids : Hydrochloric acid, nitric acid, sulphuric acid.

Weak acids : Citric acid, acetic acid, formic acid.

42. 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 write a test to detect the gas formed.

Ans. When zinc metal reacts with dil solution of strong acid such as HCl , hydrogen gas is evolved. The chemical equation is:



The hydrogen gas is used in the hydrogenation of oil. When a burning splinter is brought near the mouth of the test tube, the gas burns with a sound.

Long Answer Questions

43. In the following schematic diagram for the preparation of hydrogen gas as shown in Figure 12, what would happen if following changes are made?

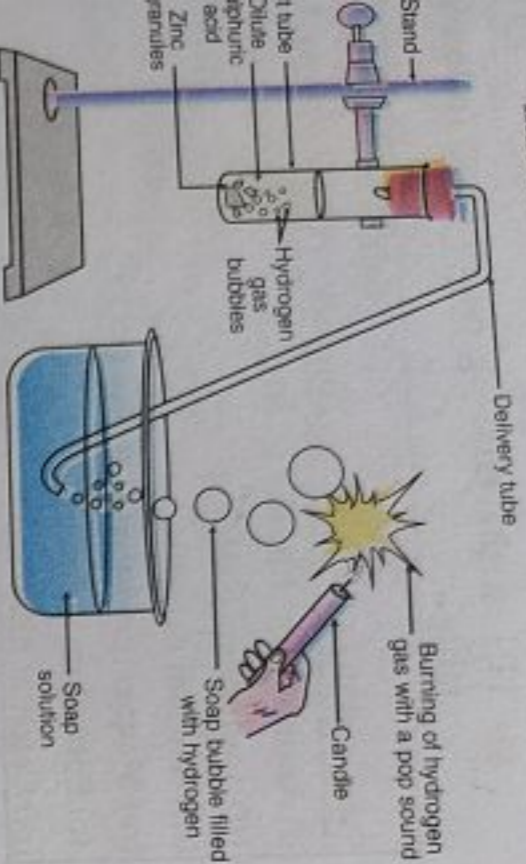


Fig. 12

- (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) In place of zinc, copper turnings are taken
 (d) Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated.

(C.B.S.E. Sample Paper 2010)

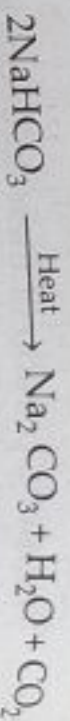
- Ans. (a) Hydrogen gas will evolve at a greater speed because zinc dust provides more surface area as compared to zinc granules and hence reacts faster.
 (b) Both will react in the same way. Almost same amount of gas will be evolved.
 (c) Copper does not react with dil HCl or dil H_2SO_4 . Therefore, no gas will be evolved.
 (d) Hydrogen gas will also be evolved in this case :



44. 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 into baking powder?
 (c) what is the role of tartaric acid added to baking soda?

Ans. (a) Baking powder is a mixture of baking soda and tartaric acid. If only baking soda is used for making cake in place of baking powder, then cake will taste bitter. This is because on heating baking soda gets converted into sodium carbonate which is bitter in taste.



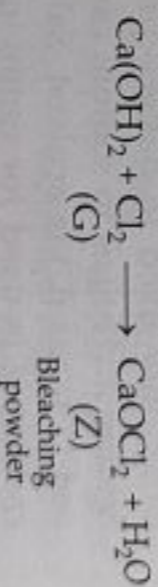
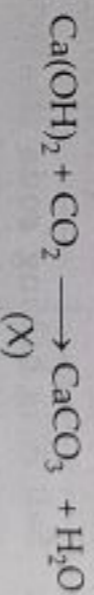
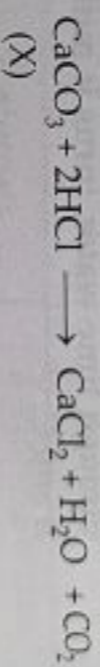
There will be no tartaric acid to neutralise sodium carbonate formed.

- (b) Baking soda can be converted to baking powder by adding appropriate amount of tartaric acid.

- (c) Tartaric acid reacts with sodium carbonate formed and neutralises it. Therefore, cake will not taste bitter.

45. 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 Y, it gives a compound Z, used for disinfecting drinking water. Identify X, Y, G and Z.

Ans. During electrolysis of brine solution, the gas evolved at anode is chlorine (G). When chlorine gas (G) is passed through dry $Ca(OH)_2$ (Y), bleaching powder (Z) is produced which is used for disinfecting drinking water. Since Y and Z are calcium salts, then 'X' is also calcium salt, calcium carbonate (X). It gives CO_2 on reacting with an acid which gives back (X) on reacting with calcium hydroxide.



46. 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 chloralkali 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.

Ans. B is common base, sodium hydroxide ($NaOH$). It is hygroscopic and therefore, absorbs moisture from the atmosphere and becomes sticky. It reacts with an acidic oxide such as CO_2 or SO_2 to give salt and water.

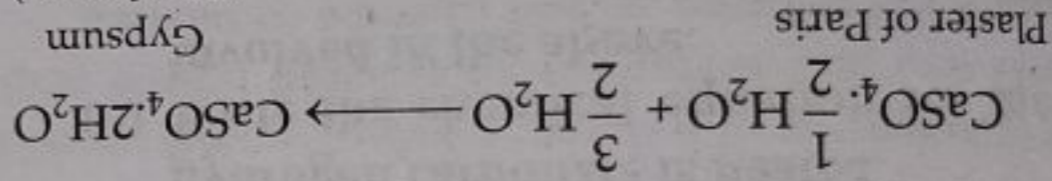


47. A sulphate salt of Group 2 element of the Periodic Table is a white, soft substance which can be moulded into different shapes by making its dough. When this compound is left in open for some time, it becomes a solid mass and cannot be used for moulding purposes. Identify the sulphate salt and why does

show such a behaviour? Give the reaction involved.

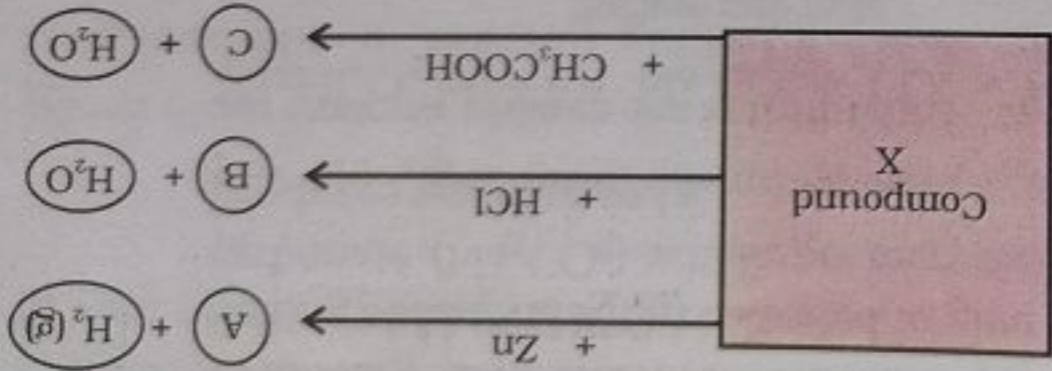
Ans.

The substance which is used for making different shapes is Plaster of Paris. It is sulphate salt of group 2 element of the periodic table and is white and soft substance. Its chemical formula is $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$. When it is left open in atmosphere for sometime, it absorbs moisture and forms gypsum which is hard solid mass.



(Hard mass)

48. Identify the compound X on the basis of the reactions given below.
Also, write the name and chemical formulae of A, B and C.



Ans.

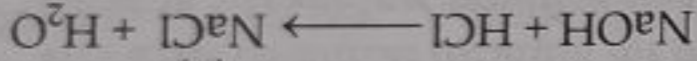
The compound X is sodium hydroxide (NaOH).
It forms A, B and C as :



Sodium

zincate

(A)



Sodium

chloride

(B)



Sodium acetate

(C)

For Practice



Some Solved CBSE Sample Questions

SECTION-A

Carbon dioxide bubbles out causing the cakes or bread to rise which makes them soft and spongy.

Tooth powder is one of the hardest substances