

Acids Bases and Salts

1.Name the acid present in the following:

(i) Tomato (ii) Vinegar (iii) Tamarind

Answer. (i) Oxalic acid (ii) Acetic acid (iii) Tartaric acid

2.15 mL of water and 10 mL of sulphuric acid are to be mixed in a beaker

(i) State the method that should be followed with reason.

(ii)What is this process called?

Answer.

(i) The acid is to be added slowly in water to prevent the mixture to be splashed. The reaction is highly exothermic, therefore, constant cooling should be done.

(ii)The process is called dilution.

3. Explain how antacid works.

Answer. Hyperacidity is caused by excess of hydrochloric acid in stomach. Antacid is basic in nature. It neutralizes excess of acid and gives relief from pain caused by hyperacidity.

4.(a) Define olfactory indicators. Name two substances which can be used as olfactory indicator.

(b) Choose strong acids from the following:

CH₃COOH, H₂SO₄, H₂CO₃, HNO₃

Answer.

(a) Those substances whose smell (odour) changes in acidic or basic solution are called olfactory indicators, e.g. onion and vanilla.

(b) H₂SO₄ and HNO₃ are strong acids.

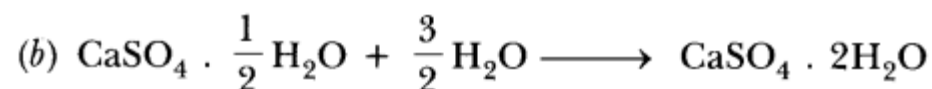
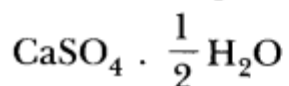
5.A white coloured powder is used by doctors for supporting fractured bones.

(a) Write chemical name and formula of the powder.

(b) When this white powder is mixed with water a hard solid mass is obtained. Write balanced chemical equation for the change.

Answer.

(a) Calcium sulphate hemihydrate



6.Explain the action of dilute hydrochloric acid on the following with chemical equation:

(i) Magnesium ribbon (ii) Sodium hydroxide (iii) Crushed egg shells

Answer.

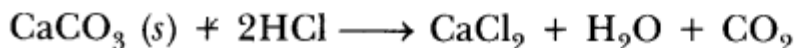
(i) Hydrogen gas will be formed



(ii) Sodium chloride and water will be formed



(iii) Crushed egg shell are made up of CaCO_3 which reacts with dil HCl to give brisk effervescence due to CO_2



7.State reason for the following statements:

(i) Tap water conducts electricity whereas distilled water does not.

(ii) Dry hydrogen chloride gas does not turn blue litmus red whereas dilute hydrochloric acid does.

(iii) During summer season, a milk man usually adds a very small amount of baking soda to fresh milk.

(iv) For a dilution of acid, acid is added into water and not water into acid.

(v) Ammonia is a base but does not contain hydroxyl group.

Answer.

(i) Tap water contains ions which conduct electricity, distilled water does not contain ions.

(ii) Dry HCl does not form ions but HCl gives H^+ and Cl^- .

(iii) Baking soda does not allow milk to change to lactic acid which makes milk sour.

(iv) Adding water to acid is highly exothermic. Therefore water is added to acid very slowly with cooling.

(v) Ammonia dissolves in water and forms H^- Therefore, it is basic in nature.

8.(a) Write the chemical formula of hydrated copper sulphate and anhydrous copper sulphate. Giving an activity illustrate how these are inter convertible.

(b) Write chemical names and formula of plaster of paris and gypsum.

Answer.

(a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is hydrated copper sulphate. CuSO_4 is anhydrous copper sulphate.

Aim: To show crystalline salts contain water of crystallization.

Material Required: $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (Blue vitriol), boiling tube, burner, cork, delivery tube, test tube, clamp stand.

Procedure: 1. Take 2g of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ in a boiling tube fitted in a clamp stand.

2. Observe its colour. Fit it with cork and delivery tube bent at two right angles which dips into a test tube.

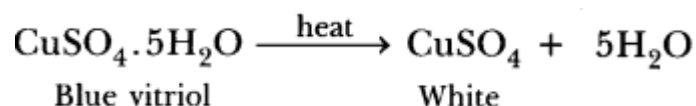
3. Heat crystals in boiling tube.

4. Observe vapours being condensed in test tube.

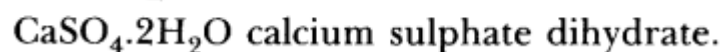
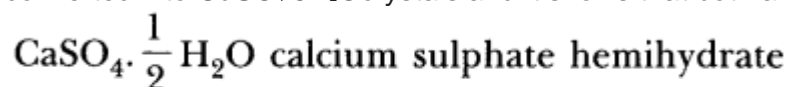
5. Cool the crystals and add few drops of water into it.

Observation: Water vapours get condensed in a test tube and colour of blue crystals changes into white. On adding water to anhydrous copper sulphate it changes into blue again.

Chemical Reaction :



Conclusion : Crystalline substances have water of crystallization which are lost on heating. When we add water in CuSO_4 till a saturated solution is formed. On cooling, it gets converted into $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ crystals and it shows that both are inter convertible.



9.(a) State the chemical properties on which the following uses of baking soda are based:

(i) as an antacid

(ii) as a soda acid fire extinguisher

(iii) to make bread and cake soft and spongy.

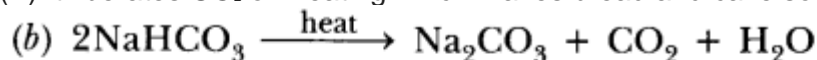
Answer.

(b) How is washing soda is obtained from baking soda? Write balanced chemical equation.

(a) (i) It is weakly basic in nature and naturalize hyperacidity.

(ii) It liberates CO_2 with H_2SO_4 , which extinguish fire.

(iii) It liberates CO_2 on heating which makes bread and cake soft and sponge.



Baking soda on heating gives sodium carbonate which on crystallisation from hydrated washing soda



10.Name the natural source of each of the following acid

(i) Citric acid. (ii) Oxalic acid.

(iii) Lactic acid. (iv) Tartaric acid.

Answer.

(i) Lemon and orange. (ii) Tomatoes and Guava.

(iii) Sour milk (curd). (iv) Tamarind.

11.A student detected the pH of four unknown solution A, B, C and D as follows 11, 5, 7 and 2. Predict the nature of the solution.

Answer. A is basic 'B' is acidic 'C' is natural and 'D' is strongly acidic.

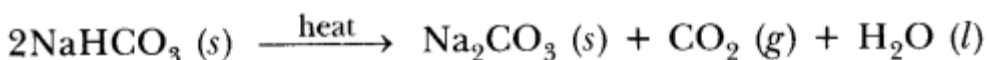
12.(i) Give the constituents of baking powder

(ii) Why cake or bread swells on adding baking powder? Write chemical equation.

Answer.

(i) Baking powder containing sodium hydrogen carbonate and tartaric acid.

(ii) It is due to carbon dioxide



13. Equal length of magnesium ribbon are taken in two test tubes 'A' and 'B'. H_2SO_4 is added to test tube 'A' and H_2CO_3 in the test tube 'B' in equal amounts:

(a) Identify the test tube showing vigorous reaction.

(b) Give reason to support your answer.

(c) Name the gas liberated in both the tubes. How will you prove its liberation?

(d) Write chemical equations for both reactions.

(e) Out of the two acids taken above

(i) which one will have lower pH value.

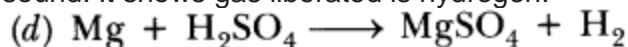
(ii) lower H^+ concentration respectively.

Answer.

(a) A will show vigorous reaction.

(b) It is because H_2SO_4 is strong acid.

(c) Hydrogen gas will be formed. Bring a burning splinter near the gas. It will burn with 'pop' sound. It shows gas liberated is hydrogen.



(e) 'A' (H_2SO_4) will have lower pH.

'B' (H_2CO_3) will have lower concentration of H^+

14. How will you test for the gas which is liberated when hydrochloric acid reacts with an active metal?

Answer. Bring a burning matchstick near the gas. It burns with 'pop' sound showing that it is hydrogen.

15.(a) Write the name given to bases that are highly soluble in water. Give an example.

(b) How is tooth decay related to pH? How can it be prevented?

(c) Why does bee sting cause pain and irritation? Rubbing of baking soda on the sting area gives relief. How?

Answer.(a) Alkali, e.g. NaOH (Sodium hydroxide).

(b) Lower the pH, more will be tooth decay. Acid reacts with $\text{Ca}_3(\text{PO}_4)_2$ and cause tooth decay. It can be prevented by brushing teeth after every meal.

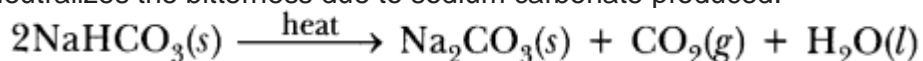
(ic) It is due to formic acid. Sodium hydrogencarbonate (Baking soda) neutralises formic acid giving relief.

16. A white powder is added while baking breads and cakes to make them soft and fluffy. Write the name of the powder. Name its main ingredients. Explain the function of each ingredient. Write the chemical reaction taking place when the powder is heated during baking.

Answer. Baking powder.

It consist of sodium hydrogencarbonate and tartaric acid.

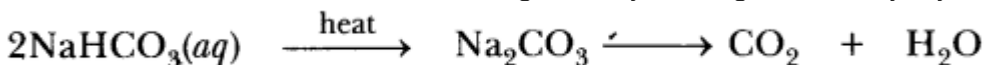
Sodium hydrogencarbonate gives CO_2 which makes cake soft and fluffy. Tartaric acid neutralizes the bitterness due to sodium carbonate produced.



17 "Sodium hydrogencarbonate is a basic salt". Justify the statement. How is it converted into washing soda? Explain.

Answer. Sodium hydrogencarbonate is a salt of sodium hydroxide (strong base) and carbonic acid (weak acid).

It is basic salt. It is converted into washing soda by heating followed by crystallization.



18. Describe an activity with diagram to illustrate that the reaction of metal carbonates and metal bicarbonates with acids produces carbon dioxide. Write the relevant equations of all the reactions that take place. Name any two forms in which calcium carbonate is found in nature.

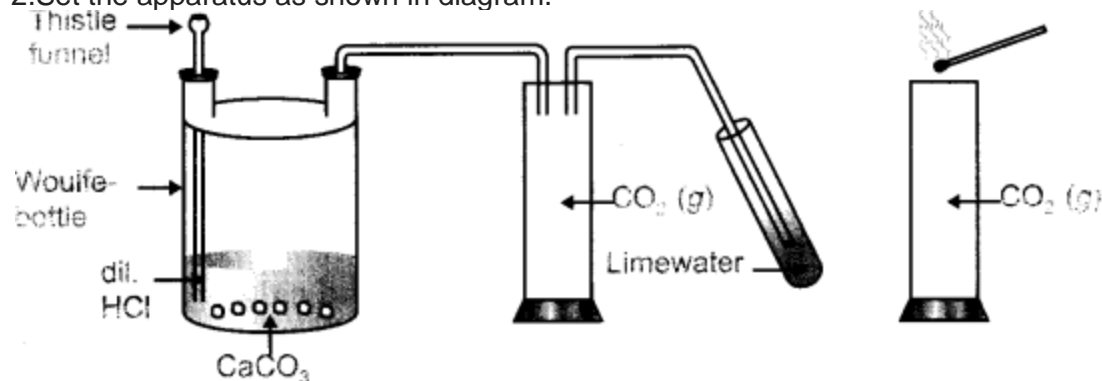
Answer.

Aim: To show acid reacts with metal carbonate to liberate carbon dioxide,

Material Required: CaCO_3 (marble chips), Woulfe-bottle, thistle funnel, dil. HCl, gas jar, matchbox, delivery tube bent at two right angles, lime water.

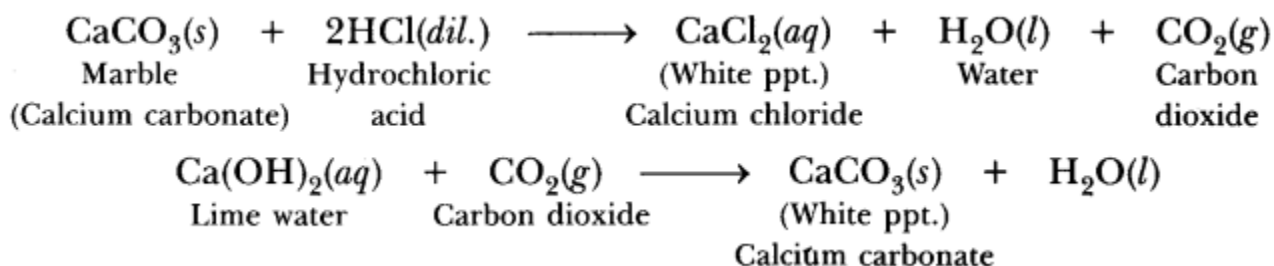
Procedure:

1. Take marble chips in a Woulfe-bottle.
2. Set the apparatus as shown in diagram.



Reaction of calcium carbonate with dilute hydrochloric acid to liberate carbon dioxide gas which turns lime water milky and extinguishes burning matchstick

3. Add dil. HCl with the help of thistle funnel.
4. Collect the gas in gas jar by upward displacement of air.
5. Bring a burning matchstick near the gas jar and record your observations.
6. Pass the gas evolved through lime water and note down your observations. Observations: The burning matchstick will get extinguished because carbon dioxide is neither combustible nor supporter of combustion. Lime water will turn milky due to formation of insoluble calcium carbonate. It can be used as test for CO_2 . The chemical reactions taking place are as follows:



Conclusion: Metal carbonates react with dilute acids to liberate carbon dioxide. Limestone,

chalk, marble are different forms of calcium carbonate. All metal carbonates and hydrogen carbonates react with acids to form corresponding salts, water and carbon dioxide.

19.(a) Identify the acid and the base whose combination forms the common salt that you use in your food. Write its formula and chemical name of this salt. Name the source from where it is obtained.

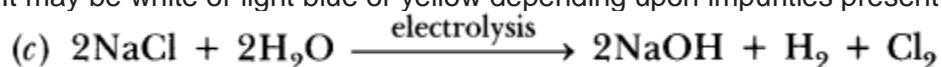
(b) What is rock salt? Mention its colour and the reason due to which it has this colour.

(c) What happens when electricity is passed through brine? Write the chemical equation for it.

Answer.

(a) HCl is acid and NaOH is base whose combination forms the common salt. Its formula is NaCl (Sodium chloride). It is obtained from sea water.

(b) Rock salt is the common name for the mineral "halite". Its chemical formula is NaCl. It may be white or light blue or yellow depending upon impurities present in it.



20.(i) Explain why is hydrochloric acid a strong acid and acetic acid, a weak acid. How can it be verified?

(ii) Explain why aqueous solution of an acid conducts electricity.

(iii) You have four solutions A, B, C and D. The pH of solution A is 6, B is 9, C is 12 and D is 7,

(a) Identify the most acidic and most basic solutions.

(b) Arrange the above four solutions in the increasing order of H⁺ ion concentration.

(c) State the change in colour of pH paper on dipping in solution C and D.

Answer.

(i) HCl is completely ionised in aqueous solution whereas acetic acid is partially ionised in aqueous solution. HCl gives dark red colour with pH paper whereas CH₃COOH gives orange colour

(ii) It is because acid ionises in aqueous solution and these ions conduct electricity. (Hi) (a) 'A' is most acidic and 'C' is most basic.

(b) C (10⁻¹²) < B (10⁻⁹) < D (10⁻⁷) < A (10⁻⁶)

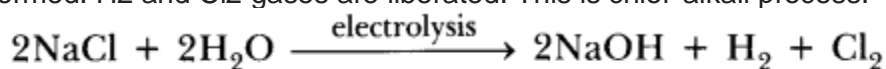
(c) pH paper will become blue in 'C' and green in 'D'.

21.(i) Dry pellets of a base 'X' when kept in open absorbs moisture and turns sticky. The compound is also formed by chlor-alkali process. Write chemical name and formula of X. Describe chlor-alkali process with balanced chemical equation. Name the type of reaction occurs when X is treated with dilute hydrochloric acid. Write the chemical equation. (ii) While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?

Answer.

(i) X is sodium hydroxide, NaOH.

When sodium chloride solution (brine solution) is electrolysed, sodium hydroxide solution is formed. H₂ and Cl₂ gases are liberated. This is chlor-alkali process.



The above reaction is neutralization reaction.

(ii) It is because process is highly exothermic. If water is added to acid, bottle of acid will break.

22. A student dropped few pieces of marble in dilute hydrochloric acid, contained in a test-tube. The evolved gas was then passed through lime water. What change would be observed in lime water? What will happen if excess of gas is passed through lime water? With the help of balanced chemical equations for all the changes explain the observations.

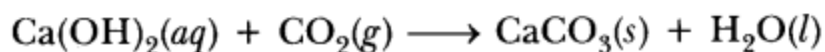
Answer.



Marble

Calcium chloride

Lime water will turn milky due to liberation of CO_2 .



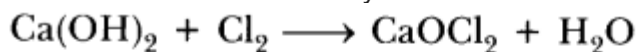
If excess of CO_2 gas is passed through lime water, milkiness will disappear due to the formation of $\text{Ca}(\text{HCO}_3)_2(\text{aq})$ which is soluble in water.



23. (a) Identify the compound of calcium which is yellowish white powder and is used for disinfecting drinking water. Write its chemical name and formula. How is it manufactured? Write the chemical equation for the reaction involved. Also list two other uses of the compound.

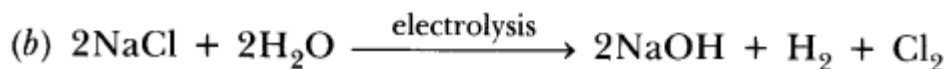
(b) Write the balanced chemical equation of chlor-alkali process.

Answer. (a) The compound is bleaching powder (CaOCl_2). Its chemical name is calcium oxychloride. It is manufactured by reaction of solid slaked lime with dry chlorine gas.



(i) It is used as disinfectant.

(ii) It is used for preparation of chloroform.



24. (a) Mention the pH range within which our body works. Explain how antacids give relief from acidity. Write the name of one such antacid.

(b) Fresh milk has a pH of 6. How does the pH will change as it turns to curd? Explain your answer.

(c) A milkman adds a very small amount of baking soda to fresh milk. Why does this milk take a longer time to set as curd?

(d) Mention the nature of toothpastes. How do they prevent tooth decay?

Answer.

(a) Our stomach has pH equal to 2. Antacids neutralizes excess of acid in our body and gives relief from hyperacidity. Sodium hydrogencarbonate is one of such antacid.

(b) pH will decrease as it turns to curd because curd is acidic due to the presence of lactic acid.

(c) It takes longer time to set as curd as bacteria do not work well in presence of sodium

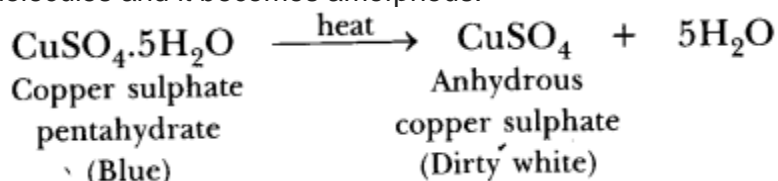
hydrogencarbonate, i.e. fermentation will take place slowly.

(d) Toothpastes are basic in nature. They neutralize the acid formed in mouth which causes tooth decay.

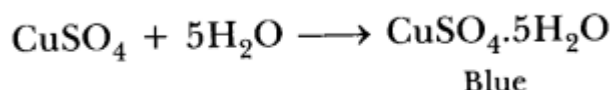
25. (a) Crystals of a substance changed their colour on heating in a closed test tube but regained it after sometime when they were allowed to cool down. Name the substance and write its formula and explain the phenomenon involved.

(b) Name the compound whose one formula unit is associated with 10 water molecules. How is it prepared? Give equations of related reactions. Give two uses of the compound.
Answer.

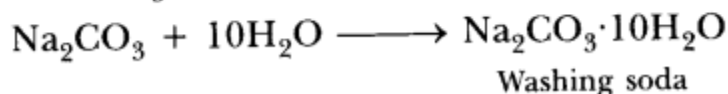
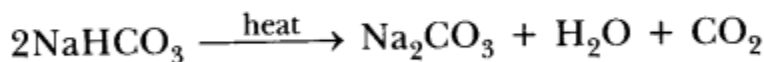
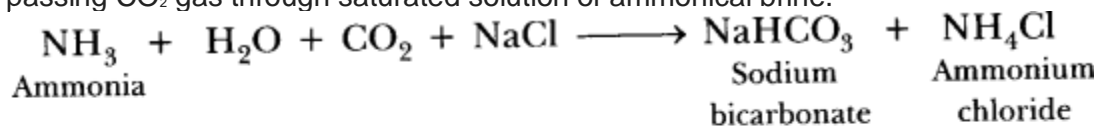
(a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is a blue crystalline solid. It becomes dirty white on heating due to loss of water molecules and it becomes amorphous.



It regains its colour by absorbing water from atmosphere and becomes blue in colour.



(b) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$. It is called sodium carbonate decahydrate or washing soda. It is prepared by passing CO_2 gas through saturated solution of ammonical brine.



Uses:

- (i) It is used in the production of washing powder.
- (ii) It is used for the manufacture of glass.

26. (a) Explain the following [chemical properties of acids](#) with the help of balanced chemical equations only.

(i) When an acid reacts with a metal carbonate.

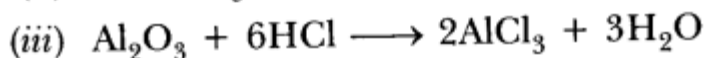
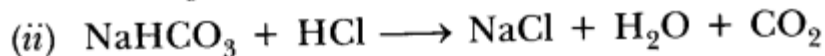
(ii) When an acid reacts with a metal bicarbonate.

(iii) When an acid reacts with a metal oxide.

(b) You are given three solutions A, B and C with pH values 2, 10 and 13 respectively.

Write which solution has more hydrogen ion concentration among the three and state the nature 'acidic or basic' of each solution.

Answer.



(b) 'A' has maximum $[\text{H}_3\text{O}^+]$ equal $10^{-2} \text{ mol L}^{-1}$

'A' is acidic whereas B and C are basic in nature.

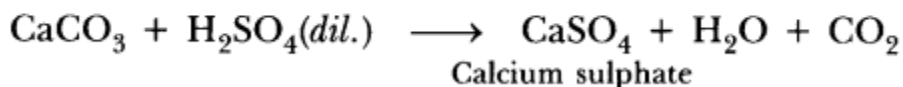
27.(a) A metal compound 'X' reacts with dil. H_2SO_4 to produce effervescence, The gas evolved extinguishes a burning candle. If one of the compound formed is calcium sulphate, then what is 'X' and the gas evolved? Also, write a balanced chemical equation for the reaction which occurred.

(b) (i) Name one antacid. How does it help to relieve indigestion in stomach?

(ii) A farmer treats the soil with quicklime or calcium carbonate. What is the nature of soil? Why does the farmer treat the soil with quicklime?

Answer.

(a) 'X' is CaCO_3 (calcium carbonate). The gas evolved is CO_2 .



(b) (i) NaHCO_3 is antacid. It neutralizes excess of acid formed in the stomach.

(ii) The soil is acidic in nature. The farmer wants to make it neutral by adding quicklime which is good for crops.

28. What are strong and weak acids? In the following list of acids, separate strong acids from weak acids.

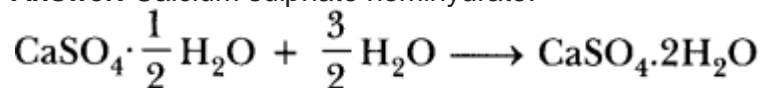
Hydrochloric acid, citric acid, acetic acid, nitric acid, formic acid, sulphuric acid.

Answer. Strong acids are those acids which are completely ionised in aqueous solution. Weak acids are those which do not ionise completely in aqueous solution. Strong acid:

HCl , HNO_3 , H_2SO_4 Weak acid: Citric acid, acetic acid, formic acid.

29. State the chemical name of Plaster of Paris. Write a chemical equation to show the reaction between Plaster of Paris and water.

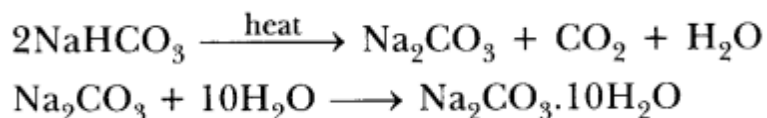
Answer. Calcium sulphate hemihydrate.



30. State in brief the preparation of washing soda from baking soda. Write balanced chemical equation of the reaction involved.

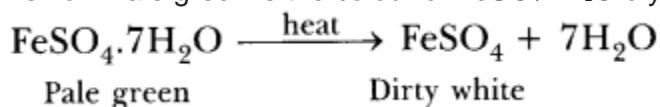
Answer. Sodium hydrogencarbonate (baking soda) on heating gives sodium carbonate which

on recrystallisation gives washing soda



31, What is the colour of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ crystals? How does this colour change upon heating? Give balanced chemical equation for the changes.

Answer. Pale green is the colour of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ crystals. It becomes dirty white on heating.



32. Classify the following salts into acidic, basic and neutral: Potassium sulphate, ammonium chloride, sodium carbonate, sodium chloride.

Answer. Neutral: Potassium sulphate, Sodium chloride
Acidic: Ammonium chloride
Basic: Sodium carbonate

33. A student dropped few pieces of marble in dilute HCl contained in a test tube. The evolved gas was passed through lime water.

(i) What change would be observed in lime water?

(ii) Write balanced chemical equation for the above change.

Answer.

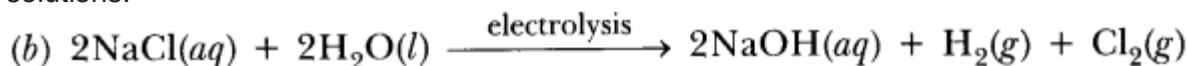
(i) Lime water will turn milky due to formation of calcium carbonate.

(ii) $\text{Ca(OH)}_2 (\text{aq}) + \text{CO}_2 (\text{g}) \longrightarrow \text{CaCO}_3 (\text{s}) + \text{H}_2\text{O} (\text{l})$

34.(a) What is universal indicator?

(b) Write the chemical equation involved in the preparation of sodium hydroxide. Name the process.

Answer. (a) Universal indicator is the mixture of synthetic indicators which is used to find pH of solutions.

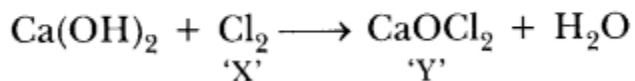


It is called chlor-alkali process.

35. 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 reactions involved.

Answer. 'X' is chlorine; 'Y' is bleaching powder.

'X' is chlorine; 'Y' is bleaching powder.



36.(i) Name the compound which is obtained from baking soda and is used to remove permanent hardness of water.

(ii) Write its chemical formula.

(iii) What happens when it is recrystallised from its aqueous solution?

Answer.

(i) Sodium carbonate is obtained from baking soda and is used to remove hardness of water.

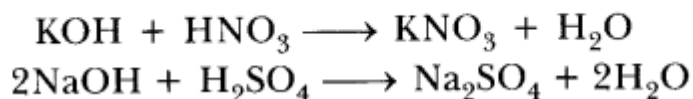
(ii) Na_2CO_3 .

(iii) It changes to washing soda, $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

37. What is a neutralisation reaction? Give two examples.

Answer.

The reaction between acid and base to form salt and water is called neutralisation reaction, *e.g.*



38. What is tooth enamel chemically? State the condition when it starts corroding. What happens when food particles left in the mouth after eating degrade? Why do doctors suggest use of tooth powder/toothpaste to prevent tooth decay?

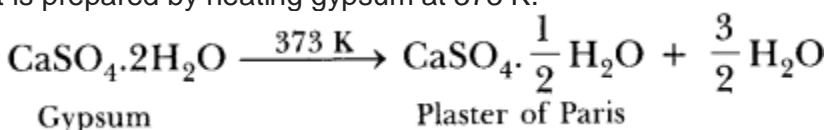
Answer. It is made up of calcium phosphate.

It starts corroding due to acid formed in mouth. The food particles which are left in mouth form acids which cause tooth decay. Toothpaste and tooth powder are basic and neutralise acid formed in mouth which prevents tooth decay.

39. What is Plaster of Paris chemically? How is it prepared? List its two important uses.

Answer. Calcium sulphate hemihydrate.

It is prepared by heating gypsum at 373 K.



(i) It is used to prepare chalks.

(ii) It is used to make casts and moulds.

40. What is baking soda chemically called? Give reaction involved in its preparation.

Write one of its uses.

Answer. Sodium hydrogencarbonate.

It is used as an antacid.

It is used as an antacid.

41.(a) What is an alkali? Give an example.

(b) Why do HCl, HNO₃, etc. show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character?

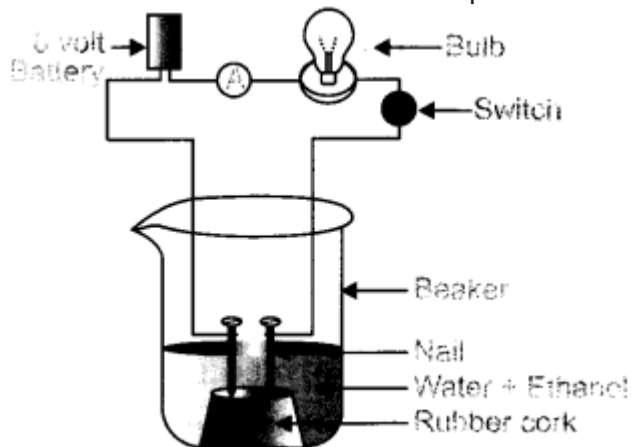
Answer.

(a) Soluble bases are called alkalis, e.g. sodium hydroxide is an alkali.

(b) HCl, HNO₃ ionise in aqueous solution, whereas alcohol and glucose do not show acidic characters because they do not ionise in aqueous solution.

42. Compounds like alcohols and glucose also contain hydrogen but are not categorised as acids. Discuss an activity to prove it.

Answer. Take a beaker of 250 ml and place two nails fixed with the help of cork.



- Connect the nails to the two terminals of a 6 volt battery as shown in figure.
- Now add some water containing ethanol and put the switch ON.
- Repeat the experiment with glucose solution.

Observation : The bulb will not glow and the needle of ammeter will not show deflection because glucose and ethanol do not conduct electricity.

Conclusion: The experiment shows glucose and ethanol do not ionise in aqueous solution, that is, they do not give H⁺ ions, therefore cannot conduct electricity. Thus, glucose and ethanol are not categorised as acids.

Very Short Answer Type Questions [1 Mark] – Year 2010

43. The pH of a sample of vegetable soup was found to be 6.5. How is this soup likely to taste?

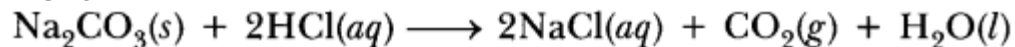
Answer. The taste will be slightly sour as it is weakly acidic.

44. Which bases are called alkalis? Give an example of alkalis.

Answer. Soluble bases are called alkalis, e.g. sodium hydroxide (NaOH).

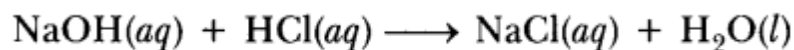
45. Write a balanced chemical equation for the reaction between sodium carbonate and hydrochloric acid indicating the physical state of the reactants and the products.

Answer.



46. Write a balanced chemical equation for a neutralisation reaction, mentioning the physical state of the reactants and the products.

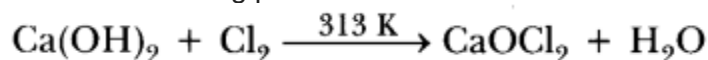
Answer.



Short Answer Type Question[I] [2 Marks] – Year 2010

47. What happens when chlorine is passed over slaked lime at 313K? Write chemical equation of the reaction involved and state two uses of the product obtained.

Answer. Bleaching powder is formed.



(i) It is used as bleaching agent in paper and textile industries.

(ii) It is used as disinfectant in purification of drinking water.

Very Short Answer Type Questions [1 Mark] – Year 2009

48. What would be the colour of red litmus in a solution of sodium carbonate?

Answer. The red litmus will change to blue in sodium carbonate solution.

49. Which gas is evolved when sodium hydrogencarbonate reacts with dilute hydrochloric acid?

Answer. Carbon dioxide gas is evolved.

50. Curd is not kept in copper and brass utensils. Why?

Answer. Curd and sour substances contain acids which react with brass and copper vessels to form poisonous salts which are harmful for our health.

51. Name the gas usually liberated when a dilute acid reacts with a metal. What happens when a burning candle is brought near this gas?

Answer. H_2 gas is liberated. It burns with pop sound when burning candle is brought near the gas.

52. What effect does an increase in concentration of $\text{H}^+(\text{aq.})$ in a solution have on the pH of solution?

Answer. Higher the concentration, lower will be pH of the solution.

54. Which one of these has a higher concentration of H^+ ions ? 1 M HCl or 1 M CH_3COOH

Answer. 1 M HCl has higher concentration of H^+ ions.

53. Why does 1 M HCl solution have a higher concentration of H^+ ions than 1 M CH_3COOH solution?

Answer. 1 M HCl has higher conc., of (H⁺) because it ionises completely in aqueous solution whereas CH₃COOH does not as it is weak acid.

54. Which gas is generally liberated when a dilute solution of hydrochloric acid reacts with an active metal?

Answer. Hydrogen gas is liberated when active metal reacts with dilute hydrochloric acid



55. What is the colour of litmus in a solution of ammonium hydroxide?

Answer. Red litmus will turn blue in ammonium hydroxide.

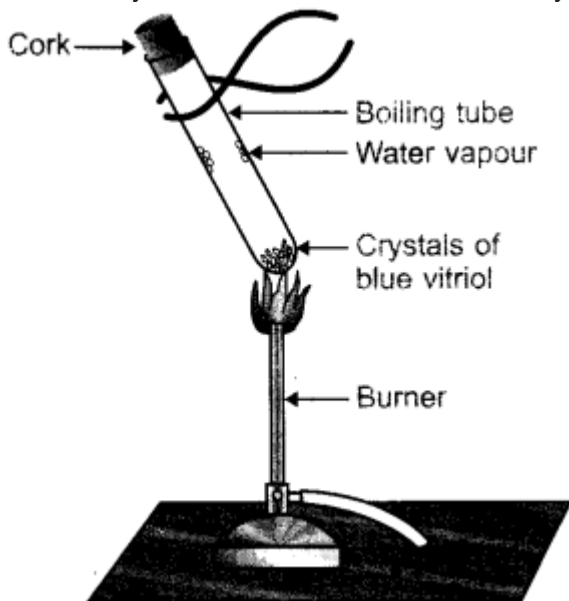
Short Answer Type Question[I] [2 Marks] – Year 2009

56. What is meant by 'water of crystallisation' of a substance ?

Describe an activity to show that blue copper sulphate crystals contain water of crystallisation.

Answer. The water molecules associated with a crystalline substance is called 'water of crystallisation'.

To show crystalline salts contain water of crystallisation.



Materials Required: CuSO₄.5H₂O (Blue vitriol), boiling tube, burner, cork, delivery tube, test tube, clamp stand.

Procedure:

1. Take 2g of CuSO₄.5H₂O in a boiling tube fitted in a clamp stand.
2. Observe its colour. Fit it with cork and delivery tube bent at two right angles which dips into a test tube.
3. Heat crystals in boiling tube. ‘
4. Observe vapours being condensed in test tube.
5. Cool the crystals and add few drops of water into it.

Observation: Water vapours get condensed in a test tube and colour of blue crystals changes into white. On adding water to anhydrous copper sulphate, it changes into blue again.

Chemical Reaction:



Blue vitriol

White

Blue vitriol White

Conclusion: Crystalline substances have water of crystallisation which are lost on heating.

Short Answer Type Questions[II] [3 Marks] – Year 2009

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

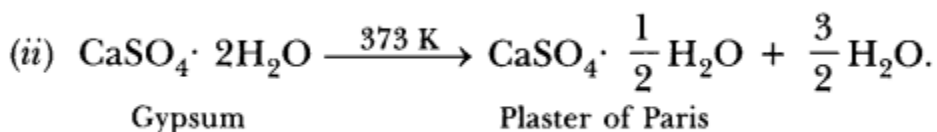
(i) Identify the compound.

(ii) Write the chemical equation for its preparation.

(iii) Mention one important use of this compound.

Answer.

(i) Plaster of Paris.



(iii) It is used for plastering fractured bones.

58. Name the products formed in each case when

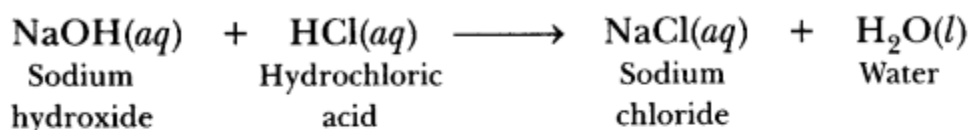
(a) hydrochloric acid reacts with caustic soda.

(b) granulated zinc reacts with caustic soda.

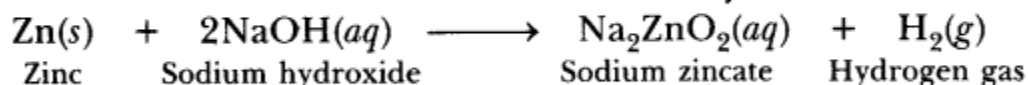
(c) carbon dioxide is passed into lime water.

Answer.

(a) Sodium chloride and water are formed.



(b) Sodium zincate and $\text{H}_2(g)$ are formed.



(c) Calcium carbonate and water are formed.

