

ACTIVITY 1

Collect the following samples from the science laboratory— hydrochloric acid (HCl), sulphuric acid (H_2SO_4), nitric acid (HNO_3), acetic acid (CH_3COOH), sodium hydroxide (NaOH), calcium hydroxide [$\text{Ca}(\text{OH})_2$], potassium hydroxide (KOH), magnesium hydroxide [$\text{Mg}(\text{OH})_2$], and ammonium hydroxide (NH_4OH). Put a drop of each of the above solutions on a watch-glass and test with a drop of the following indicators. What change in colour did you observe with red litmus, blue litmus, phenolphthalein and methyl orange solutions for each of the solutions taken? Tabulate your observations in Table

ACTIVITY 2

Take some finely chopped onions in a plastic bag along with some strips of clean cloth. Tie up the bag tightly and leave overnight in the fridge. The cloth strips can now be used to test for acids and bases. Take two of these cloth strips and check their odour. Keep them on a clean surface and put a few drops of dilute HCl solution on one strip and a few drops of dilute NaOH solution on the other.

Rinse both cloth strips with water and again check their odour. Note your observations. Now take some dilute vanilla essence and clove oil and check their odour. Take some dilute HCl

solution in one test tube and dilute NaOH solution in another. Add a few drops of dilute vanilla essence to both test tubes and shake well. Check the odour once again and record changes in odour, if any. Similarly, test the change in the odour of clove oil with dilute HCl and dilute NaOH solutions and record your observations.

ACTIVITY 3

Take about 5 mL of dilute sulphuric acid in a test tube and add a few pieces of zinc granules to it. What do you observe on the surface of zinc granules? Pass the gas being evolved through the soap solution. Why are bubbles formed in the soap solution? Take a burning candle near a gas filled bubble. What do you observe? Repeat this Activity with some more acids like HCl, HNO_3 and CH_3COOH . Are the observations in all the cases the same or different?

ACTIVITY 4

Place a few pieces of granulated zinc metal in a test tube. Add 2 mL of sodium hydroxide solution and warm the contents of the test tube. Repeat the rest of the steps as in Activity 3 and record your observations

ACTIVITY 5

Take two test tubes, label them as A and B. Take about 0.5 g of sodium carbonate (Na_2CO_3) in test tube A and about 0.5 g of

sodium hydrogencarbonate (NaHCO_3) in test tube B. n Add about 2 mL of dilute HCl to both the test tubes. What do you observe? Pass the gas produced in each case through lime water (calcium hydroxide solution) and record your observations.

ACTIVITY 6

Take about 2 mL of dilute NaOH solution in a test tube and add two drops of phenolphthalein solution. What is the colour of the solution? Add dilute HCl solution to the above solution drop by drop. Is there any colour change for the reaction mixture? Why did the colour of phenolphthalein change after the addition of an acid? Now add a few drops of NaOH to the above mixture. Does the pink colour of phenolphthalein reappear? Why do you think this has happened?

ACTIVITY 7

Take a small amount of copper oxide in a beaker and add dilute hydrochloric acid slowly while stirring. Note the colour of the solution. What has happened to the copper oxide?

ACTIVITY 8

Take solutions of glucose, alcohol, hydrochloric acid, sulphuric acid, etc. Fix two nails on a cork, and place the cork in a 100 mL beaker. Connect the nails to the two terminals of a 6 volt battery through a bulb and a switch. Now pour some dilute HCl in the

beaker and switch on the current. Repeat with dilute sulphuric acid. What do you observe? Repeat the experiment separately with glucose and alcohol solutions. What do you observe now? Does the bulb glow in all cases?

ACTIVITY 9

Take about 1g solid NaCl in a clean and dry test tube and set up the apparatus. Add some concentrated sulphuric acid to the test tube. What do you observe? Is there a gas coming out of the delivery tube? Test the gas evolved successively with dry and wet blue litmus paper. In which case does the litmus paper change colour? On the basis of the above Activity, what do you infer about the acidic character of: (i) dry HCl gas (ii) HCl solution?

ACTIVITY 10

Take 10 mL water in a beaker. Add a few drops of concentrated H_2SO_4 to it and swirl the beaker slowly. Touch the base of the beaker. Is there a change in temperature? Is this an exothermic or endothermic process? Repeat the above Activity with sodium hydroxide pellets and record your observations

ACTIVITY 11

Test the pH values of solutions. Record your observations. What is the nature of each substance on the basis of your observations?

- 1 Saliva (before meal)
- 2 Saliva (after meal)
- 3 Lemon juice
- 4 Colourless aerated drink
- 5 Carrot juice
- 6 Coffee
- 7 Tomato juice
- 8 Tap water
- 9 1M NaOH
- 10 M HCl

Activity 12

Put about 2 g soil in a test tube and add 5 mL water to it. Shake the contents of the test tube. Filter the contents and collect the filtrate in a test tube. Check the pH of this filtrate with the help of universal indicator paper. What can you conclude about the ideal soil pH for the growth of plants in your region

ACTIVITY 13

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. Salts having the same positive or negative radicals are said to belong to a family. For example, NaCl and Na_2SO_4 belong to the family of sodium salts. Similarly, NaCl and KCl belong to the family of chloride salts. How many families can you identify among the salts given in this Activity?

ACTIVITY 14

Collect the following salt samples – sodium chloride, potassium nitrate, aluminium chloride, zinc sulphate, copper sulphate, sodium acetate, sodium carbonate and sodium hydrogencarbonate (some other salts available can also be taken). Check their solubility in water (use distilled water only). Check the action of these solutions on litmus and find the pH using a pH paper. Which of the salts are acidic, basic or neutral? Identify the acid or base used to form the salt. Report your observations

ACTIVITY 15

Heat a few crystals of copper sulphate in a dry boiling tube. What is the colour of the copper sulphate after heating? Do you notice water droplets in the boiling tube? Where have these come from? Add 2-3 drops of water on the sample of copper sulphate

obtained after heating. What do you observe? Is the blue colour of copper sulphate restored?