

## Chemistry Worksheets Class 10 on Chapter 2 Acids, Bases and Salts with Answers - Set 1

**Q1.** The property which is not shown by acids is-

- a.) they have a sour taste.
- b.) they feel soapy.
- c.) they turn litmus red.
- d.) their pH is less than 7.

**Correct Answer–** (b.) they feel soapy.

**Q2.** A solution reacts with zinc granules to give a gas which burns with a pop sound. The solution contains:

- a.)  $\text{Mg}(\text{OH})_2$
- b.)  $\text{Na}_2\text{CO}_3$
- c.)  $\text{NaCl}$
- d.)  $\text{HCl}$

**Correct Answer–** (d.)  $\text{HCl}$

**Q3.** A solution turns red litmus blue. Its pH is likely to be:

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

**Correct Answer–** (d.) 10

**Q4.** Which of the following salts does not contain water of crystallisation?

- a.) Blue vitriol
- b.) Baking soda
- c.) Washing soda
- d.) Gypsum

**Correct Answer–** (b.) Baking soda

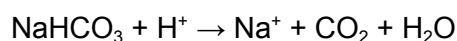
**Q5.** Bases generate \_\_\_ ions in water.

- a.)  $\text{H}^-$
- b.)  $\text{H}^+$
- c.)  $\text{OH}^-$
- d.)  $\text{OH}^+$

**Correct Answer–** (c.)  $\text{OH}^-$

**Q6.** What is the role of tartaric acid in baking powder?

**Answer.** Baking powder is added to a mixture of baking soda and weak edible acids. For example, we add baking powder while preparing the cake. But when baking soda is heated then it produces a base that is bitter in taste. So to neutralize the bitterness we add tartaric acid.



**Q7.** What is the chemical formula of blue vitriol?

**Answer.** The common name of copper sulphate is blue vitriol. Its chemical formula of it is  $\text{CuSO}_4$ .

**Q8.** What is the role of HCl present in the stomach?

**Answer.** HCl present in the stomach has multiple uses as follows:

- It provides an acidic medium for the enzymes present in the stomach to function properly. These enzymes are activated by the secretion of HCl.
- HCl in the stomach is highly acidic (pH between 1 – 2) and helps in killing bacteria and other harmful microorganisms.

**Q9.** What is the effect of dilution on an acid or base?

**Answer.** Dilution is the process of decreasing the strength of an acid or base. Acids produce  $\text{H}_3\text{O}^+$  ions and bases produce  $\text{OH}^-$  ions in water. When they are diluted, the concentration of these ions is decreased per unit volume. This results in a decrease of the strength of the acid or base.

**Q10.** Explain why bases are not kept in metal containers?

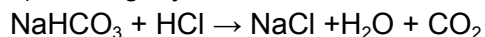
**Answer.** Bases react with active metals (highly reactive metals) to form salt and hydrogen gas that is unfit for human consumption. Metal containers, as a result, cannot be used to store bases.

**Q11.** State the chemical property in each case on which the following uses of baking soda are based:

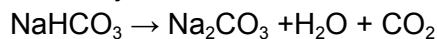
- i.) As an antacid
- ii.) As a constituent of baking powder.

**Answer.**

i.) It is slightly alkaline in nature and neutralises stomach acid (HCl).



ii.) When cake is baked, it emits  $\text{CO}_2$  in the form of bubbles. As a result, the cake becomes both porous and fluffy.



**Q12.** What is the water of crystallisation?

**Answer.** There are some salts which contain a few water molecules as an essential part of their crystal structure. The water molecule which forms part of the structure of a crystal is called water of crystallisation. The salts which contain water of crystallisation are called hydrated salts. Every hydrated salt has a fixed number of molecules of water of crystallisation.

**Q13.** Define olfactory indicators.

**Answer.** Those substances whose smell changes in acidic or basic solutions are called olfactory indicators. An olfactory indicator works on the principle that when an acid or base is added to it, then its characteristic smell cannot be detected. For example- onion and vanilla extract.

Onion has a characteristic smell. In basic solutions, the characteristic smell disappears, whereas an acidic solution does not destroy its smell.

Vanilla extract has a pleasant smell. In basic solutions, the characteristic smell disappears, whereas an acidic solution does not destroy its smell.

**Q14.** While diluting an acid why is it recommended that the acid should be added to water and not water to the acid?

**Answer.** The reaction of acid and water is an exothermic reaction since a lot of heat is liberated during the reaction. This heat changes some water to steam explosively which can splash the acid on our face or clothes and cause acid burns.

While diluting an acid, it is preferred that the acid is added to water rather than the water being added to the acid. Adding water to a concentrated acid releases a large amount of heat, which can cause an explosion and acid burns on the skin, clothing, and other body parts. As a result, adding acid to water is safe, but adding water to acid is not.

**Q15.** Sea water contains many salts dissolved in it. How can the salt that we use in the food is obtained?

**Answer.** Many salts are present in seawater. When seawater is allowed to stand in shallow pits, sunlight evaporates the water, which slowly turns into water vapour. The water evaporates completely

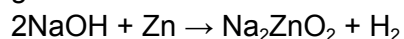
in a few days, leaving behind the solid salts. After further purification, common salt is obtained from this salt mixture. The salt we use in our food is obtained through the same process.

**Q16.**

- a.) What happens when zinc granules are heated with sodium hydroxide solution?
- b.) What does pH stand for? What does it indicate?

**Answer.**

a.) When zinc granules are heated in a solution of sodium hydroxide, sodium zincate salt and hydrogen gas are formed.



b.) pH stands for the potential of hydrogen. pH is the numerical value to measure the basicity and acidity of the solution. The pH value ranges from 0 to 14. Acid solutions have a pH value less than 7 and the basic solution has a pH more than 7.

**Q17.** a.) What is gypsum? What happens when gypsum is heated at 100°C?

b.) What is the common name of the compound  $\text{CaOCl}_2$ ?

c.) Explain why chlorine is used for sterilising the drinking water supply?

**Answer.** a.) Gypsum is calcium sulphate dihydrate,  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ . When gypsum is heated to 100°C, it loses its  $\frac{3}{4}$  of its water of crystallization and forms plaster of Paris.

b.) The common name of the compound  $\text{CaOCl}_2$  is Bleaching powder. Its chemical name is Calcium hypochlorite.

c.) Pathogens such as bacteria and viruses are killed by chlorine by breaking the chemical bonds in their molecules. Disinfectants for this purpose are made up of chlorine compounds that can exchange atoms with other compounds, such as enzymes found in bacteria and other cells.

**Q18.** a.) What is baking powder? How does it make the cake soft and spongy?

b.) In addition to sodium hydrogen carbonate, baking powder contains a substance X. Name the substance X. What is the role of substance X in the baking powder?

c.) State the two uses of sodium hydroxide.

**Answer.**

a.) Baking powder is made from a mixture of baking soda and tartaric acid. When mixed with water, sodium hydrogen carbonate reacts with tartaric acid, releasing carbon dioxide gas that gets trapped in the wet dough and slowly bubbles out, making the cake soft and spongy.

b.) Substance X is tartaric acid and it reacts with sodium carbonate formed and neutralises it otherwise cakes and bread will taste bitter.

c.) Sodium hydroxide uses:

- It is used for making soaps and detergents.
- It is used in the production of paper.

**Q19.** a.) A knife, which is used to cut 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?

b.) What should be done if someone accidentally touches the leaves of a nettle plant in the wild?

c.) Two solutions X and Y have pH = 4 and pH = 8, respectively. Which solution will give an alkaline reaction and which one acidic?

**Answer.** a.) The fact that the blue litmus has turned red indicates that the fruit juice is acidic in nature.

b.) The area should be rubbed with baking soda or it should be rubbed by the leaf of the dock plant (which often grows beside the nettle plant in the jungle).

c.) Solution X has a pH of 4 (less than 7) and will produce an acidic reaction. Solution Y has a pH of 8 (greater than 7) and will produce an alkaline reaction.

**Q20.** Answer the following-

a.) Compounds such as alcohol and glucose also contain hydrogen but are not categorised as acids. Why?

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

c.) Why should curd and other sour foodstuffs not be kept in the metal container?

d.) Name three common indicators.

**Answer.**

a.) Acid ionizes to give  $H^+$  ions in an aqueous medium but glucose and alcohol do not produce  $H^+$  ions even though they contain hydrogen atoms. Thus, compounds such as alcohol and glucose are not categorised as acids.

b.) The acidic behaviour of acid is caused by the presence of hydrogen ions  $H^+$ , as pH is directly proportional to  $H^+$  concentration.

Since acids do not dissociate to produce  $H^+$  (aq) ions in the absence of water, they do not exhibit acidic behaviour.

c.) Curds and other sour foods stuff are acidic in nature. Acids react with the metal to produce hydrogen gas thus it spoils the food and also forms some toxic metal compounds which make the foodstuffs to become poisonous, and these toxins may damage our health.

d.) Litmus, Methyl orange and phenolphthalein are examples of some common indicators.