12. INTRODUCTION TO ACID & BASE

Q 1) Identify the following solutions, whether they are acid or alkali.

Solution	Change in Indicator			Acid/Alkali
	Litmus	Phenolphthalein	Methyl orange	
1.	…..	No change	……	
2.	…..	…..	Orange color turns red	
3.	Red litmus turns blue	…….	…..	

Ans.

Solution	Change in Indicator			Acid/Alkali
	Litmus	Phenolphthalein	Methyl orange	
1.	Blue litmus turns red	No change	Orange color turns red	Acid
2.	Blue litmus turns red	No change	Orange color turns red	Acid
3.	Red litmus turns blue	Colorless solutions turns pink	Yellow	Alkali

Q 2) Write chemical names from given formulae.

H_2SO_4, $Ca(OH)_2$, HCl, NaOH, KOH, NH_4OH

Ans.

Formula	Chemical name
H_2SO_4	Sulphuric acid
$Ca(OH)_2$	Calcium hydroxide
HCl	Hydrochloric acid
NaOH	Sodium hydroxide
KOH	Potassium hydroxide
NH_4OH	Ammonium hydroxide

Q 3) Sulphuric acid has highest importance in chemical industry. Why?

Ans 1) Sulphuric acid is used in making fertilizers such as ammonium sulphate and also superphosphate of lime, manufacturing chemicals, in paper production, detergents, dyeing, medicines, insecticides, explosives, etc. 2) It is colorless mineral acid that is soluble in water in any concentrations. 3) Sulphuric acid is used in production of ores, plastics, glue, film etc. 4) In electric cells and batteries dilute sulphuric acid is used. 5) Sulphuric acid is known as 'king of chemicals' as it is used in various fields. 6) To remove rust from products sulphuric acid is used in iron and steel industry.

Q 4) Give answers

a. Which acid is used for getting chloride salt?

Ans. Salt is the formation of acid and alkali. The chloride ion from hydrochloric acid is in chloride salt. Thus hydrochloric and (HCl) is used to obtain chloride salt.

b. By squeezing lemon on a piece of rock the gas liberated turned lime water milky. Which compound is present in the rock?

Ans. The compound in the rock is calcium carbonate. . The acidic property to react with metal releases carbon dioxide CO_2 gas, that makes lime water milky.

The following reaction will occur:

Calcium Carbonate	+	Citric acid (lime juice)	⟶	Calcium citrate	+	carbon dioxide gas

c. The label on the bottle of chemical is spoiled. How will you find whether the chemical is acidic or not?

Ans. 1) The indicators such as litmus paper are helpful to see if chemical is acidic or not or a natural indicator turmeric can also be used as a litmus paper.

2) If colour of chemical changes to blue litmus red, result is acidic, and if colour of chemical changes to red litmus blue, then

result is basic. Thus we can find using litmus paper or turmeric if chemical is acidic or basic in nature.

Q 5) Answer the following questions.

a. Explain the difference between acid and alkali.

Ans.

Acid	Alkali
1. The taste of acids is sour in taste	1.The taste of alkali is bitter.
2.The main constituent is hydrogen ion (H^+).	2.The main constituent is hydroxide ion (OH)
3.The blue litmus changes to red in acidic.	3.The red litmus changes blue in alkali.
4.The nature of nonmetal oxides is acidic.	4.The nature of metal oxides are alkaline.
Eg. HCl, H_2SO_4, etc	5.Eg.NaOH, $Mg(OH)_2$, etc

b. Why indicator does not get affected by salt?

Ans. The indicators can change their color when their is presence of acid or alkali. Salt does not contain H^+or H^- ions, it is mixture of acid (hydrochloric acid) and alkali(sodium hydroxide) it is neutral that means acidic nor alkaline. Salts does not affect indicators.

c. Which substances are produced by neutralization process?

Ans. The substances produced by neutralization process is salt and water as it has combination of acid and alkali.

d. Which are the industrial uses of acids?

Ans.1) Hydrochloric acid is used to prepare different types of chloride salts. 2)Acids are used in manufacturing and production of chemical fertilizers. Also in manufacturing and producing explosives, dyes oil purification, medicines, etc. 3) Acid is used in production of white paper from wood pulp. 4) Dilute sulphuric acid (H_2SO_4) is used in the electric cell. sterilizing water.

Q 6) Select proper word given in bracket and fill in the blanks.

a. Main constituent of acid is ……

Ans. H^+ ions

b. Main constituent of alkali is……

Ans. H^- ions

c. Tartaric acid is a …… Acid.

Ans. Natural acid or carbonic acid

Q 7) Match the pairs.

Group A	Group B
1.Tamarind	a. Acetic acid
2. Curd	b. Citric acid
3. Lemon	c. Tartaric acid
4. Vinegar	d. Lactic acid

Group A	Group B
1.Tamarind	Tartaric acid
2. Curd	Lactic acid
3. Lemon	Citric acid
4. Vinegar	Acetic acid

Q 8) State true or false

a. Oxides of metals are alkaline in nature

Ans. True

b. Salt (NaCl) is acidic.

Ans. False (Salt NaCl is neutral)

c. Metal corrodes due to salts

Ans. False. (Acids and Bases corrodes salts.)

d. Salts are neutral.

Ans. True

Q 9) Classify following substances into acidic, basic and neutral group -

HCl, NaCl, MgO, KCl, CaO, H_2, SO_4, HNO_3, H_2O, Na_2CO_3

Ans.

Acidic group	Basic group	Neutral group
HCl, H_2, SO_4, HNO_3	MgO, CaO, Na_2CO_3	NaCl, KCl, H_2O,

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