04. ACIDS, BASES AND SALTS

Questions and Answers

1. Reflection on Concepts

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

A. The reaction between an acid and a base to produce salt and water is called neutralization reaction.

Acid + Base → Salt + Water

Ex: $HCl + NaOH \rightarrow NaCl + H_2O$

$H_2SO_4 + Ca(OH)_2 \rightarrow CaSO_4 + 2H_2O$

2. What happens when an acid or base is mixed with water? Is this process exothermic or endothermic one?

A. By mixing of acid to water , the concentration of hydrogen ions per unit volume decreases. This gives diluted acid. Similarly, by mixing of base to water, the concentration of hydroxide ions per unit volume decreases. This gives diluted base. Dilution of acid or base is an exothermic process.

3. Distilled water does not conduct Electricity. Why?

A. Electricity passes through a solution when ions present in it. Distilled water does not contain any ionic substance that can dissociate hydronium ion. That's why It does not conduct electricity.

4. Dry hydrogen chloride gas does not turn blue litmus to red whereas hydrochloric acid does. Why?

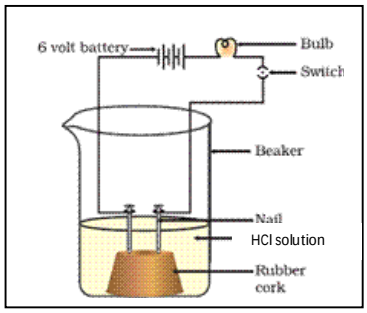
A. Dry HCl gas (Hydrogen chloride) is not an acid. So it does not turn blue litmus to red. Because The HCl gas dissociates in presence of water to produce hydrogen ions. In the absence of water dissociation of HCl molecules do not occur.

6. Why does the flow of acid rain into a river make the survival of aquatic life in a river difficult?

A. Living organisms can survive only in a narrow range of pH change. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows in to the rivers, it lowers the pH of the river water, the survival of aquatic life in such rivers becomes difficult.

5. Draw a neat diagram showing acid solution in water conducts electricity.

A.



7. What is baking powder? How does it make the cake soft and spongy?

A. Baking powder is a mixture of baking soda and a mild edible acid such as tartaric acid. When baking powder is heated or mixed in water, the following reaction takes place.

$NaHCO_3 + H+ \rightarrow CO_2 + H_2O$ + sodium salt of acid.

Carbon dioxide produced during the reaction causes bread or cake to rise making them soft and spongy.

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

A. Uses of Baking Soda ($NaHCO_3$):

i) Baking powder is used in the preparation of bread and cake. Carbon dioxide produced during the reaction causes bread or cake to rise making them soft and spongy.

ii) Baking soda is also an ingredient in antacids. Being alkaline, it neutralizes excess acid in the stomach and provides relief.

iii) It is also used in soda-acid fire extinguishers

iv) It acts as mild antiseptic.

NAGA MURTHY- 9441786635
Contact at : nagamurthysir@gmail.com
Visit at : ignitephysics.weebly.com

Uses of Washing soda (Na_2CO_3) :

i) Sodium carbonate (washing soda) is used in glass, soap and paper industries.

ii) It is used in the manufacture of sodium compounds such as borax.

iii) Washing soda can be used as a cleaning agent for domestic purposes.

iv) It is used for removing permanent hardness of water.

2. Applications of Concepts

1. 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.

A.

Solution	p^H	Type of solution
A	4	Weak acid
B	1	Strong acid
C	11	Strong base
D	7	Neutral
E	9	Weak base

Arrangement of substances in increasing order of hydrogen ion concentration is

$p^H=11 < p^H=9 < p^H=7 < p^H=4 < p^H=1$

C < E < D < A < B

2. Why does tooth decay start when the pH of mouth is lower than 5.5.

A. Tooth enamel, made of calcium phosphate is the hardest substance in the body. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth. This acids attack on the enamel. So Tooth decay starts when the pH of the mouth is lower than 5.5.

3. 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?

A. a) A milkman adds a very small amount of baking soda to fresh milk. By making the milk more alkaline , it prevents for more time to turn into curd.

b) This milk take a long time to set as curd. Because the acid produced to set into curd will be neutralized by baking soda. It takes long time to set as curd.

4. Plaster of Paris should be stored in moisture-proof container. Explain. Why?

A. Plaster of Paris should be stored in moisture-proof container. Because it turns into Gypsum after reacting with moisture present in air. Also it sets into hard solid.

$CaSO_4.\frac{1}{2}H_2O + 1\frac{1}{2}H_2O \rightarrow CaSO_4.2H_2O$

5. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid is added to test tube A, while acetic acid is added to test tube B. Amount and concentration of both the acids is same. In which test tube will the fizzing occur more vigorously and why?

A. Magnesium is a metal. Strong acids reacts rapidly with metals. As HCl is a strong acid than acetic acid, In test tube A fizzing occur vigorously. And HCl reacts with magnesium ribbon.

*3.Higher Order Thinking Questions

1. Fresh milk has a pH of 6. Explain why the pH changes as it turns into curd?

A. Fresh milk has a p^H of 6. By releasing lactic acid by Lacto bascillus bacteria, the milk turns into curd. As the p^H values of acids are less, The value of p^H of milk decreases, when it turns into curd.

2. How do you prepare your own indicator using beetroot? Explain.

A. To prepare beet root indicator, we need beet root and a filter paper. Extract juice from beet root and filter it. Drop a filter paper into the juice. Let it be dry. The dried paper acts as beet root indicator.

NAGA MURTHY- 9441786635
Contact at : nagamurthysir@gmail.com
Visit at : ignitephysics.weebly.com