

Science

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(Chapter – 2) (Acids, Bases and Salts)
(Class 10)

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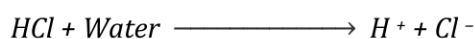
Question 1:

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 1:

The dissociation of HCl or HNO₃ to form hydrogen ions always occurs in the presence of water. Hydrogen ions (H⁺) combine with H₂O to form hydronium ions (H₃O⁺).

The reaction is as follows:



Although aqueous solutions of glucose and alcohol contain hydrogen, these cannot dissociate in water to form hydrogen ions. Hence, they do not show acidic character.

Question 2:

Why does an aqueous solution of an acid conduct electricity?

Answer 2:

Acids dissociate in aqueous solutions to form ions. These ions are responsible for conduction of electricity.

Question 3:

Why does dry HCl gas not change the colour of the dry litmus paper?

Answer 3:

Colour of the litmus paper is changed by the hydrogen ions. Dry HCl gas does not contain H⁺ ions. It is only in the aqueous solution that an acid dissociates to give ions. Since in this case, neither HCl is in the aqueous form nor the litmus paper is wet, therefore, the colour of the litmus paper does not change.

Question 4:

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

Answer 4:

The process of dissolving an acid or a base in water is a highly exothermic one. Care must be taken while mixing concentrated nitric acid or sulphuric acid with water. The acid must always be added slowly to water with constant stirring. If water is added to a concentrated acid, the heat generated may cause the mixture to splash out and cause burns. The glass container may also break due to excessive local heating.

Question 5:

How is the concentration of hydronium ions (H₃O⁺) affected when a solution of an acid is diluted?

Answer 5:

When an acid is diluted, the concentration of hydronium ions (H₃O⁺) per unit volume decreases. This means that the strength of the acid decreases.

Question 6:

How is the concentration of hydroxide ions (OH⁻) affected when excess base is dissolved in a solution of sodium hydroxide?

Answer 6:

The concentration of hydroxide ions (OH⁻) would increase when excess base is dissolved in a solution of sodium hydroxide.