

Key Terms

Introduction to Acids, Bases, and Salts

acid - Any of a class of substances whose aqueous solutions are characterized by a sour taste, the ability to turn blue litmus red, and the ability to react with bases and certain metals to form salts.

base - Any of a class of compounds whose aqueous solutions are characterized by a bitter taste, a slippery feel, the ability to turn litmus blue, and the ability to react with acids to form salts.

salt - Chemical compound formed when the hydrogen of an acid is replaced by a metal or its equivalent.

Arrhenius acid - A substance which releases hydrogen ions (H^+) in solution.

Arrhenius base - A substance which releases hydroxide ions (OH^-) in solution.

operational definition

operational definition of an acid - Any substance that increases the concentration of the H^+ ion with dissolved in water.

operational definition of a base - Any substance that increases the concentration of the OH^- ion when dissolved in water.

Brønsted-Lowry acid - Any substance that can "donate" hydrogen ions (H^+) or protons to bases which "accept" them.

Brønsted-Lowry base - Any substance that can "accept" hydrogen ions (H^+) or protons from acids which "donate" them.

Indicators and the pH Scale

pH - A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity. The pH scale commonly in use ranges from 0 to 14.

pOH - A logarithmic scale measuring the acidity (or basicness) of a solution. It is based on the amount of OH^- (hydroxide ions) in the solution.

strong acid - An acid with a high degree of dissociation in solution; for example HCl or H_2SO_4 .

weak acid - An acid that does not ionize greatly; for example, acetic acid or carbonic acid.

strong base - A base with a high degree of dissociation in solution; for example NaOH or KOH.

weak base - A chemical base that does not ionize fully in an aqueous solution; for example ammonia.

electrolyte - A chemical compound that ionizes when dissolved or molten to produce an electrically conductive medium.

indicator - Any of various substances, such as litmus or phenolphthalein, that indicate the presence, absence, or concentration of another substance or the degree of reaction between two or more substances by means of a characteristic change, especially in color.

litmus paper - An unsized white paper impregnated with litmus and used as a pH or acid-base indicator.

phenolphthalein - A white or pale yellow crystalline powder, $C_{20}H_{14}O_4$, used as an acid-base indicator, in making dyes, and formerly in medicine as a laxative. Because of its toxicity, it is no longer used in over-the-counter laxatives.

Neutralization Reactions

neutralization reaction - A reaction between an acid and a base that yields a salt and water.

titration - The process, operation, or method of determining the concentration of a substance in solution by adding to it a standard reagent of known concentration in carefully measured

amounts until a reaction of definite and known proportion is completed, as shown by a color change or by electrical measurement, and then calculating the unknown concentration.

end point - The point in a titration at which no more titrant should be added. It is determined, for example, by a color change in an indicator or by the appearance of a precipitate.

equivalence point - The point in a titration where the amounts of titrant and material being titrated are equivalent chemically.

hydronium - A hydrated hydrogen ion, H_3O^+ .

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