

Properties of Acids and Bases

Arrhenius theory acids are substances that contains hydrogen and dissociates to produce H^+ , and a base is any substance that contains hydroxide and dissociates to produce OH^-

disadvantage of arrhenius theory not all bases contain OH^- , but can produce it when dissolved in water Ex: $NH_3 - NaCO_3$

Bronsted-Lowry Theory Acids are H^+ donors, bases are H^+ acceptors

Conjugate Pairs acids that donate H^+ and become bases are called conjugate bases, while bases that accept H^+ and become acids are called conjugate acids

acids and bases are both electrolytes

water can act as an acid and base, so it is amphoteric

PH and POH

$$PH = -\log[H^+]$$

$$POH = -\log[OH^-]$$

$$PH + POH = 14$$

Monoprotic and Polyprotic Acids

Monoprotic Acid can only donate one H^+ ion

Polyprotic Acid can donate multiple H^+ ions

Lewis Theory acids are an electron pair acceptor, bases are an electron pair donor

Lewis Acids BF_3, BCl_3, H^+, Ag^+

Lewis Bases F^-, PCI_3, NH_3, Cl^-

Acidic Anhydrides nonmetal oxides that react with water to produce an acid Ex: CO_2

Basic Anhydrides metal oxides that react with water to form a base Ex: CaO

water dissociation constant (k_w) $[H^+] \times [OH^-] = 10^{-14}$

Neutralization and Titration

Neutralization Reaction acid + base = water + salt

Titration a method of finding an unknown acid or base's concentration by using a known one (standard solution)

Equivalence Point Moles H^+ = Moles OH^-

acid-base indicators substances that change color in acidic or basic solutions (bromothymol, phenolphthalein)

Hydrolysis of salt a reaction in which one of the salt's ions reacts with water to produce an acidic or basic solution

Buffer Solution a solution that resists a change in its PH

Buffer capacity the amount of acid or base that can be added without a significant change in PH



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Page 1 of 1.

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