

Properties of Acids

Conducts electricity

Tastes sour

Neutralizes bases

Reacts with metals to form hydrogen gas

pH between 0-7

Corrodes metals

Strong Acids vs Weak Acids

Reacts completely (>99%) with water to produce a high concentration of hydronium ions

Low pH

High electrical conductivity

High rate of reaction with metals and carbonates

Reacts incompletely with water (<50%) to form relatively few hydronium ions

Relatively high pH

Relatively low conductivity

Low rate of reaction with active metals and carbonates

Properties of Bases

Conducts electricity

Tastes bitter

Neutralizes acids

pH between 7-14

Dissolves grease

Feels slippery/soapy

Strong Bases vs Weak Bases

Dissociates completely (>99%)

High pH (closer to 14)

Faster reaction rate

High conductivity

Reacts partially with water (<50%)

Lower pH (closer to 8)

Slower reaction rate

Low conductivity

Classical Naming of Acids

Ending in -ide hydro_____ic acid

Ending in -ate _____ic acid

Ending in -ite _____ous acid

Classical Naming of Bases

Generally ionic hydroxides

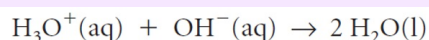
Use the standard ionic naming (NaOH is sodium hydroxide)

Bronsted-Lowry Acid-Base Concept

Bronsted-Lowry Acid: a proton donor

Bronsted-Lowry Base: a proton acceptor

Neutralization

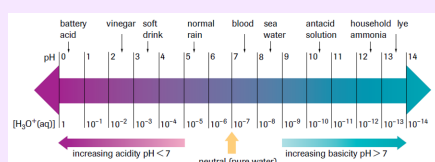


Neutralization: a type of double replacement between an acid and a base

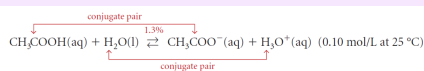
Amphoteric Substances

Amphoteric Substances: substances that can react as an acid or as a base

pH Chart



Conjugate Acids & Bases



In a proton transfer reaction at equilibrium, both forward and reverse reactions involve Bronsted-Lowry acids and bases

Conjugate Acids/Bases: a pair on substances with formulas that differ only by a proton

Monoprotic & Polyprotic Acids

Monoprotic Acids: only have one acidic hydrogen ion in their compound formula and can *react only once with water* to produce hydronium ions

- Most strong acids and some weak acids are monoprotic acids

- Ex. Monoprotic Acids: HCl and HCN

Polyprotic Acids: contain more than one acidic hydrogen in their compound formula and can *react more than once* with water

- Generally weak acids whose reaction with water decreases with each successive step

- Exception is sulfuric acid because the first reaction is essentially complete

- Ex. Polyprotic Acid: H₃PO₄

Monoprotic & Polyprotic Bases

Monoprotic Bases: can react with water only once to produce hydroxide ions

- Ex. CH₃COO⁻

Polyprotic Bases: weak bases whose reaction with water decreases with each successive step

- Ex. CO₃²⁻

