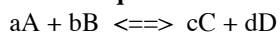


Useful Information

Equilibrium reactions



$$K = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

pH equations

$$[H_3O^+] [OH^-] = 1 \times 10^{-14} \quad pH + pOH = 14$$

$$pH = -\log[H_3O^+] \quad [H_3O^+] = 10^{-pH}$$

$$pOH = -\log[OH^-] \quad [OH^-] = 10^{-pOH}$$

Electronegativity Values of Selected Elements

Metallic Elements			Nonmetallic Elements			
Li (1.0)	Be (1.5)	H (2.1)	C (2.5)	N (3.0)	O (3.5)	F (4.0)
Na (1.0)	Mg (1.2)	Al (1.5)	P (2.1)	S (2.5)	Cl (3.0)	
K (0.9)	Ca (1.0)	Sc (1.3)		Se (2.4)	Br (2.8)	

Solutions and Molarity

$$M = \frac{\text{moles}}{L} \quad M \times V = \text{moles}$$

$$\text{Dilutions} \quad M_1 V_1 = M_2 V_2$$

Electronegativity

Difference Bond type

0-0.4 (non-metals)	Non polar covalent
0.5 or more (non metals)	Polar Covalent
Metal + non-metal	Ionic

TABLE 9.1 Relative Strengths of Acids and Their Conjugate Bases

	Acid	Conjugate Base	
↑ Strong Acids ↓ Weak Acids	HI	Hydroiodic acid	Γ ⁻ Iodide ion
	H ₂ SO ₄	Sulfuric acid	HSO ₄ ⁻ Hydrogen sulfate ion
	HCl	Hydrochloric acid	Cl ⁻ Chloride ion
	HNO ₃	Nitric acid	NO ₃ ⁻ Nitrate ion
	H ₃ O ⁺	Hydronium ion	H ₂ O Water
	HSO ₄ ⁻	Hydrogen sulfate ion	SO ₄ ²⁻ Sulfate ion
	H ₃ PO ₄	Phosphoric acid	H ₂ PO ₄ ⁻ Dihydrogen phosphate ion
	HF	Hydrofluoric acid	F ⁻ Fluoride Ion
	CH ₃ CO ₂ H	Acetic acid	CH ₃ CO ₂ ⁻ Acetate ion
	H ₂ CO ₃	Carbonic acid	HCO ₃ ⁻ Bicarbonate ion
	H ₂ S	Hydrogen sulfide	HS ⁻ Hydrogen sulfide ion
	H ₂ PO ₄ ⁻	Dihydrogen phosphate ion	HPO ₄ ²⁻ Hydrogen phosphate ion
	NH ₄ ⁺	Ammonium ion	NH ₃ Ammonia
	C ₆ H ₅ OH	Phenol	C ₆ H ₅ O ⁻ Phenoxide ion
	HCO ₃ ⁻	Bicarbonate ion	CO ₃ ²⁻ Carbonate ion
	HPO ₄ ²⁻	Hydrogen phosphate ion	PO ₄ ³⁻ Phosphate ion
	H ₂ O	Water	OH ⁻ Hydroxide ion
	C ₂ H ₅ OH	Ethanol	C ₂ H ₅ O ⁻ Ethoxide ion
↓ Weak Bases			↓ Strong Bases