

Chemical Reactions Outline

Water soluble

electrolytes

strong electrolytes

weak electrolytes

non-electrolytes

(demonstration of lamp with electrodes to test a solution)

Solubility Rules

group IA and ammonium compounds are soluble

acetates and nitrates are soluble

most halide salts are soluble

exceptions: Ag^+ , Hg_2^{2+} , Pb^{2+} (and HgBr_2 and HgI_2)

most sulfates are soluble

exceptions: Ca^{2+} , Sr^{2+} , Ba^{2+} , Ag_2^{2+} , Hg_2^{2+} , Pb^{2+}

most carbonates, phosphates and sulfides are insoluble

exceptions: group IA and ammonium

most hydroxides are insoluble

exceptions: group IA, Ca^{2+} , Sr^{2+} , Ba^{2+}

Molecular, Total Ionic and Net Ionic Equations

molecular equation shows compounds and molecules

total ionic equation separates all soluble salts into ions

net ionic equation cancels any spectator ions from both sides of the chemical reaction

Types of Chemical Equations

Metathesis Reactions

Precipitation Reactions

Acid-Base Reactions

strong acids and bases produce water and salt

weak acids and bases produce water and salt but exist in equilibrium with reactants

neutralization is a general term for the reaction of an acid and a base

Combination or synthesis

Decomposition

note the decomposition of carbonic acid to form carbon dioxide gas and water

Single Displacement Reaction

activity series for metals and for non-metals

Combustion

Redox Reactions (study deferred until later in the course)