Topic 6K - Representing Redox Reactions

Types of Chemical Reactions

Precipitation (Ion Exchange)

$$BaCl_2\ (aq) + Na_2SO_4\ (aq) \rightarrow BaSO_4\ (s) + 2\ NaCl\ (aq)$$

Acid-Base (Proton Transfer)

$$HCl\ (aq) + NaOH\ (aq) \rightarrow NaCl\ (aq) + H_2O\ (l)$$

Lewis Acid-Base (e^- Pair Sharing)

$$NH_3\ (g) + H_2O\ (l) \rightarrow NH_4OH\ (aq)$$

Oxidation-Reduction (e^- Transfer Among Atoms)

$$Zn\ (s) + CuSO_4\ (aq) \rightarrow Cu\ (s) + ZnSO_4\ (aq)$$

Redox Reactions

Oxidation-Reduction

Oxidation - Loss of e^- 's (Reducing Agent)
Reduction - Gain of e^- 's (Oxidizing Agent)

Occur in Tandem
Examples:

$$4\,Fe + 3\,O_2 \rightarrow 2\,Fe_2O_3$$

↑ Reducing Agent ↑ Oxidizing Agent

$$2\,Br^- + Cl_2 \rightarrow Br_2 + 2\,Cl^-$$

↑ Reducing Agent ↑ Oxidizing Agent

Oxidation Numbers

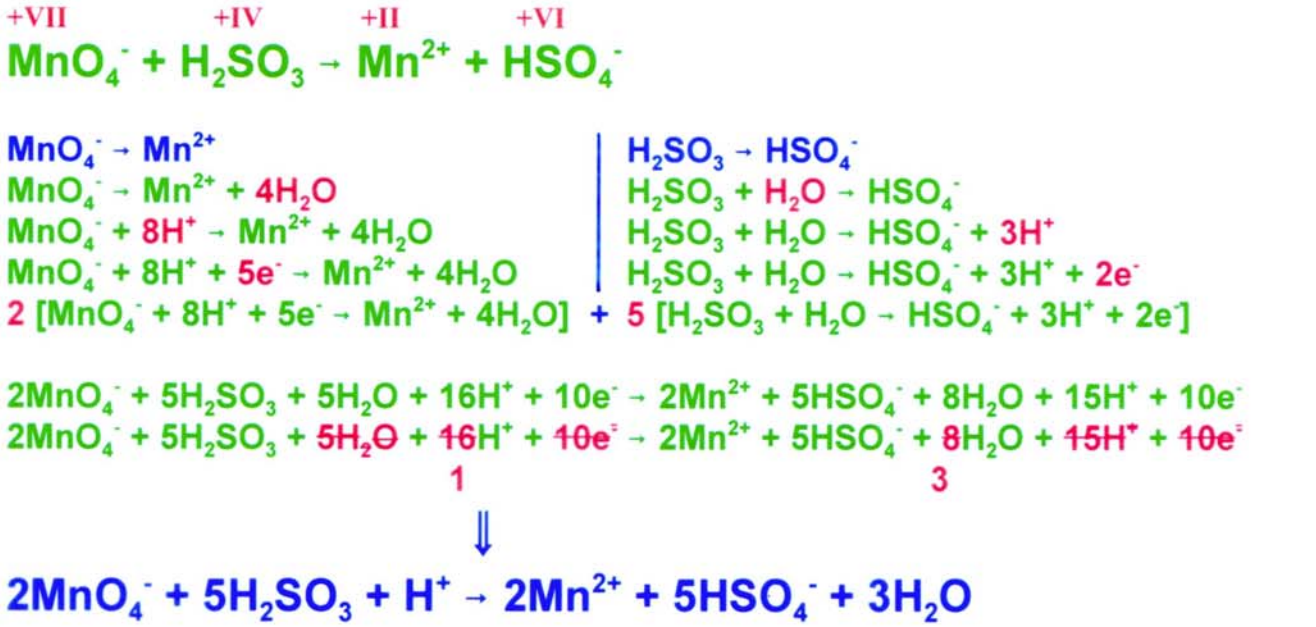
Based on differences in electronegativity (for polyatomic species)
Comparison to formal charge
"Rules" for assignment

Redox Reactions

Concept of half-reactions
Balancing redox reactions

Balancing Redox Reactions

Acidic Solution



Alkaline Solution