CONCEPT: BALANCING REDOX REACTIONS (SIMPLIFIED)

- **Balancing Redox Reactions** requires a new approach that accounts for the transfer of electrons between reactants.
  - □ Redox reactions not only balance the atoms of elements, but also _____ and _____.

Half-Reactions

- Balancing a redox reaction begins with identifying its *half reactions*.
  - □ **Half Reaction:** Either the oxidation or reduction reaction portion of a redox reaction.
  - □ Usually a half reaction is obtained by identifying the elements that are found as _____ & _____.

EXAMPLE: Identify the half reactions from the following redox reaction.

$$Mn^{5+}\,(aq) + Cl^{-}\,(aq) \longrightarrow Mn^{2+}\,(aq) + Cl_2\,(g)$$

Balancing Redox Reactions

EXAMPLE: Balance the following redox reaction.

$$Ni\,(s) + Co^{3+}\,(aq) \longrightarrow Ni^{2+}\,(aq) + Co^{2+}\,(aq)$$

STEP 1: Break the full redox reaction into 2 half reactions.

STEP 2: Balance the overall charge by adding **electrons** to the more _____ charged side of each half reaction.

- □ If the number of electrons of both half reactions differ then _____ to get the lowest common multiple.

STEP 3: Combine the half reactions and _____ the electrons on both sides.

CONCEPT: BALANCING REDOX REACTIONS (SIMPLIFIED)

PRACTICE: Balance the following redox reaction.

$$Fe^{2+}\,(aq) + Cr\,(s) \longrightarrow Fe\,(s) + Cr^{3+}\,(aq)$$

PRACTICE: Balance the following redox reaction.

$$Ce^{4+}\,(aq) + Sn^{2+}\,(aq) \longrightarrow Ce^{3+}\,(aq) + Sn^{4+}\,(aq)$$

PRACTICE: Balance the following redox reaction.

$$Cl_2\,(aq) + KI\,(aq) \longrightarrow KCl\,(aq) + I_2\,(aq)$$