CHE 101 General Chemistry Dr. Joe Bentley

RULES FOR BALANCING OXIDATION–REDUCTION REACTIONS USING THE ION ELECTRON METHOD

1. Assign oxidation numbers to each element appearing in the reaction.

2. Split the reaction into two half–reactions, one for reduction, the other for oxidation.

3. Balance one of the half–reactions with respect to both **mass** (atoms) and **charge**.

4. Balance the other half–reaction similarly.

5. Combine the two half–reactions in such a way as to eliminate electrons.

6. Balance O or H atoms by adding H_2O or H^+, and balance the charge by adding electrons. Thus, the half–reactions should be balanced in the following order:
    - the atom of the element being oxidized or reduced
    - oxygen, using H_2O molecules
    - hydrogen, using H^+ ions
    - charge, using electrons