

Outline for Today

Wednesday, Oct. 3

- Chapter 4: Aqueous Reactions and Solution Stoichiometry
 - Balancing Reduction-Oxidation Reactions (Section 20.2)
- Chapter 5: Thermochemistry
 - How is energy transferred or transformed in chemical reactions?

Balancing Redox Reactions

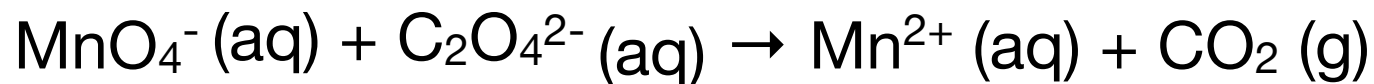
1. Separate total reaction into **two half reactions**.
2. Assign **Oxidation Numbers** to each atom
3. Balance each half reaction:
 - A. Balance all **elements** besides H and O
 - B. Balance **O** by adding H₂O
 - C. Balance **H** by adding H⁺
 - D. Balance **charge** by adding e⁻
4. Multiply half reactions by integers so that half reactions have **equal number of electrons**
5. **Add** the half reactions and **simplify!**

Balancing Redox Half Reactions (Section 20.2)

- Example 1. Balance:



- Example 2. Balance:



Determining Oxidation Numbers

Species	Oxidation Number
Elemental Atoms	0
Monoatomic Ion	Charge on Ion
Hydrogen Bonded to Nonmetal	+1
Hydrogen Bonded to Metal	-1
Oxygen	Usually -2
Fluorine	-1
Other Halogens	Usually -1
Neutral Molecule	Sum of Oxidation Numbers is 0
Polyatomic Ion	Sum of Oxidation Numbers is Ion charge