Various Reduction-Oxidation Reactions

- **Reduction-Oxidation (redox) reactions involve the transfer of e^- from one species to another.**
- **The REDUCED species gains electrons (or reduces its oxidation number).**

$$Cu^{+2}_{(aq)} + 2\,e^- \rightarrow Cu_{(s)}$$
+2 (ox. #) 0 (ox. #)

- **The OXIDIZED species loses electrons (or increases its oxidation number).**

$$Zn_{(s)} \rightarrow Zn^{+2}_{(aq)} + 2\,e^-$$
0 (ox. #) +2 (ox. #)

- **The electrons given by the oxidized species are transferred to the species being reduced. (There is always reduction with oxidation.)**

$$Zn_{(s)} + Cu^{+2}_{(aq)} \rightarrow Cu_{(s)} + Zn^{+2}_{(aq)}$$

- **The REDUCING AGENT is the species that causes the other species to be reduced.**

  Zn caused Cu^{+2} to be reduced;
  Zn is reducing agent

- **The OXIDIZING AGENT is the species that causes the other species to be oxidized.**

  Cu^{+2} caused Zn to be oxidized;
  Cu^{+2} is oxidizing agent

- **The oxidation number of any element is ZERO.**

Experiment

- **In each of the various redox reactions, you will identify:**
  - **a) the species being oxidized**
  - **b) species being reduced**
  - **c) the oxidizing agent**
  - **d) the reducing agent**

- **Part I examines redox reactions of metals with HCl.**
- **Part II examines redox reaction of Cu^{+2} with glucose.**
- **Part III examines redox reactions of MnO_4^- in both acidic and basic solutions.**
- **Part IV examines redox reactions of ClO^- in both acidic and basic solutions.**