

Honors Chem Redox Study Guide:

Section 1: Determining Oxidation Numbers

- Determine the oxidation number of the underlined element in each compound or ion.
 - $\text{H}\underline{2}\text{SO}_4$
 - $\text{Na}\underline{2}\text{S}$
 - $\text{Cl}\underline{2}\text{O}_7$
 - $\text{K}\underline{2}\text{Cr}\underline{2}\text{O}_7$
 - $\text{Fe}\underline{3}\text{O}_4$

Section 2: Identifying Redox Reactions and Oxidizing/Reducing Agents

- For each reaction, identify the oxidizing agent and reducing agent.
 - $\text{Cu} + 2\text{AgNO}_3 \rightarrow 2\text{Ag} + \text{Cu}(\text{NO}_3)_2$
 - $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
 - $2\text{Al} + 3\text{Br}_2 \rightarrow 2\text{AlBr}_3$
 - $\text{MnO}_4^- + 8\text{H}^+ + 5\text{e}^- \rightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O}$

Section 3: Redox Half-Reactions

- Write the half-reaction for the oxidation and reduction processes in each reaction.
 - $\text{Cu} + 2\text{AgNO}_3 \rightarrow 2\text{Ag} + \text{Cu}(\text{NO}_3)_2$
 - $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
 - $2\text{Al} + 3\text{Br}_2 \rightarrow 2\text{AlBr}_3$

Section 4: Reduction Potential, Anode, and Cathode

- Given the half-reactions and reduction potentials:
 - $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$ $E^\circ = +0.34 \text{ V}$
 - $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$ $E^\circ = -0.76 \text{ V}$
 - $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$ $E^\circ = +0.80 \text{ V}$

Determine the anode, cathode, overall cell reaction, and cell potential for a galvanic cell.