

Unit #8, Chapter 10 Outline
Electrochemistry and Redox Reactions

Lesson	Topics Covered	Homework Questions and Assignments
1	<p>Introduction to Electrochemistry</p> <ul style="list-style-type: none"> • definitions • full ionic and net ionic equations • half reactions <p>Oxidation and Reduction</p> <ul style="list-style-type: none"> • definitions • oxidizing and reducing agents • “redox” reactions <p>Activity Series for Metals</p> <ul style="list-style-type: none"> • using the activity series to predict single displacement reactions 	<ol style="list-style-type: none"> 1. Read pages 462 – 467 2. On page 467, do questions 1 – 4 3. On page 468, do questions 5 – 7 4. On page 472, do questions 1 – 3, 6
2	<p>Oxidation Numbers</p> <ul style="list-style-type: none"> • the “Rules” • using oxidation numbers to identify oxidizing and reducing agents in chemical reactions 	<ol style="list-style-type: none"> 1. Read pages 476 – 477 2. On page 478, do questions 9 – 11 3. Read pages 478 – 480 4. On page 480, do questions 13 – 15 5. Complete homework: Oxidation Numbers
3	<p>Balancing Redox Reactions in Acidic Conditions</p> <ul style="list-style-type: none"> • the half-reaction method 	<ol style="list-style-type: none"> 1. Read pages 482 – 484, 486 – 490 (don’t worry about balancing under basic conditions for now) <p>For the questions below, there are various instructions. Please just balance the redox reactions as you have been taught using the half reaction method:</p> <ol style="list-style-type: none"> 2. On page 491, do questions 27a,b,c, 28c,d 3. On page 494, do questions 2, 3, 6 4. On page 497, do questions 30 – 32 5. On page 498, do questions 1 – 3
4	<p>Balancing Redox Reactions in Basic Conditions</p> <ul style="list-style-type: none"> • the half-reaction method 	<p>Balance the net ionic equations below using the half reaction method under acidic and basic conditions:</p> <ol style="list-style-type: none"> 1. $\text{MnO}_2 + \text{Cl}^{1-} \rightarrow \text{Mn}^{2+} + \text{Cl}_2$ 2. $\text{NO} + \text{Sn} \rightarrow \text{NH}_2\text{OH} + \text{Sn}^{2+}$ 3. $\text{Cd}^{2+} + \text{V}^{2+} \rightarrow \text{Cd} + \text{VO}_3^{1-}$ 4. $\text{S}_2\text{O}_3^{2-} + \text{NiO}_2 \rightarrow \text{Ni}(\text{OH})_2 + \text{SO}_3^{2-}$ 5. $\text{Mn}^{2+} + \text{BiO}_3^{1-} \rightarrow \text{MnO}_4^{1-} + \text{Bi}^{3+}$ 6. $\text{I}_2\text{O}_5 + \text{CO} \rightarrow \text{I}_2 + \text{CO}_2$ 7. $\text{NO}_2 \rightarrow \text{NO}_2^{1-} + \text{NO}_3^{1-}$ 8. $\text{P}_4 \rightarrow \text{H}_2\text{PO}_2^{1-} + \text{PH}_3$

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5	Introduction to Electrochemical Cells <ul style="list-style-type: none">• Galvanic cells• Electrolytic cells• Electrodes• Electrolytes• Direction of electron motion• Galvanic cell notation	<ol style="list-style-type: none">1. Read pages 504 – 508.2. On page 509, do questions 1a, 2, 33. On page 515, do question 84. For the redox reactions in Q 5 – 8 on page 521 of your text: write the two half reactions taking place, calculate the E° for the reaction, identify the anode and cathode, and identify the oxidizing agent and the reducing agent.5. Make a labeled sketch of a simple electrochemical cell using gold and aluminum electrodes.<ol style="list-style-type: none">a) Write the equations for the oxidation and the reduction half-reactions for this cell.b) On your sketch, label the anode and the cathode and indicate the direction of electron flow.c) Write the equation for the overall cell reaction and calculate the E° for this cell.
6	Calculating Standard Cell Potentials <ul style="list-style-type: none">• standard reduction potentials, E°• calculating standard cell potentials• interpreting values of E°	<ol style="list-style-type: none">1. On page 521, do questions 5 – 7 (just calculate E° the way we did in the lessons. You may use the mathematical shortcut)2. On page 523, do questions 1 and 2a