NAME: **HONORS CHEMISTRY**

SECTION: Redox Review Sheet

**After studying this chapter, you should be able to:**

* Compute the oxidation number of an atom of any element in a pure substance.
* Identify the oxidizing and reducing agent in a redox reaction .
* Distinguish between redox and non-redox reactions.
* Define oxidation and reduction in terms of a change in oxidation number and identify atoms being oxidized or reduced in redox reactions.
* Apply the half-reaction method to balance redox equations in acidic conditions
* Relate chemical activity to oxidizing and reducing strength.
* Explain a voltaic cell using a sketch, labeling the cathode, the anode, and the direction of electron flow.
* Compute the standard cell potential of a cell using standard electrode potentials
* Distinguish between electrolytic and voltaic cells.

Calculate the oxidation number of each atom in the following substances.

1. NaClO3
2. Li2O
3. Br2
4. HIO2
5. K2O
6. (NH4)2CO3
7. Li2CrO4
8. CrF3

Identify these reactions as oxidation or reduction.

1. Rb 🡪 Rb+ + e-
2. 2F- 🡪 F2 + 2e-
3. Al3+ + 3e- 🡪 Al
4. Cl2 + 2e- 🡪 2 Cl

Use the change in oxidation number to identify which elements are oxidized and which are reduced in each of these reactions. Identify the oxidizing and reducing agents.

1. O2 + 2 H2O 🡪 2 H2O2 (note peroxide)
2. Li + MgSO4 🡪 Mg + Li2SO4
3. 2 Na + Br2 🡪 2 NaBr
4. I2O5 + 5 CO 🡪 I2 + 5 CO2
5. 4 P4 + 5 S8 🡪 9 P2S5
6. SbCl5 + 2 KI🡪 SbCl3 + 2 KCl + I2
7. A voltaic cell was constructed using electrodes based on the following half reactions.

Pb2+ + 2 e- 🡪 Pb

Au3+ + 3 e- 🡪 Au

1. Draw and label the voltaic cell, including the cathode, anode, salt bridge, and direction of electron flow.
2. Write the half reaction that occurs at each electrode.

Anode: Cathode:

1. Write the overall redox reaction for this cell.
2. Calculate the cell potential.
3. Balance the equations and calculate the cell voltage for the following voltaic cells. Use the table of standard reduction potentials.
4. Mn/Mn2+ and Pb/Pb2+
5. Cr/Cr3+ and Cs/Cs+
6. Sn/Sn2+ and Ag/Ag+
7. Cu/Cu+ and Fe/Fe2+

21. Balance the following redox reactions

a) CrO42- +Cl- 🡪 Cr3+ + HClO2 (in acidic conditions)

b) BrO3- + Sb3+ 🡪 Br- + Sb5+ (in acidic conditions)