ASSIGNING OXIDATION NUMBERS

Name _____

Assign oxidation numbers to all of the elements in each of the compounds or ions below.

1. HCl	11. H_2SO_3
2. KNO_3	12. H_2SO_4
3. OH^-	13. BaO_2
4. Mg_3N_2	14. $KMnO_4$
5. $KClO_3$	15. LiH
6. $Al(NO_3)_3$	16. MnO_2
7. S_8	17. OF_2
8. H_2O_2	18. SO_3
9. PbO_2	19. NH_3
10. $NaHSO_4$	20. Na

REDOX REACTIONS

Name _____

For the equations below, identify the substance oxidized, the substance reduced, the oxidizing agent, the reducing agent, and write the oxidation and reduction half reactions.

Example: $\overset{\text{oxidized}}{\underset{\text{reducing agent}}{Mg}} + \overset{\text{reduced}}{\underset{\text{oxidizing agent}}{Br_2}} \rightarrow MgBr_2$

oxidation half reaction: $Mg^{\circ} \rightarrow Mg^{+2} + 2e^-$

reduction half reaction: $2e^- + Br_2^{\circ} \rightarrow 2Br^-$

1. $2H_2 + O_2 \rightarrow 2H_2O$

2. $Fe + Zn^{2+} \rightarrow Fe^{2+} + Zn$

3. $2Al + 3Fe^{+2} \rightarrow 2Al^{+3} + 3Fe$

4. $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$

BALANCING REDOX EQUATIONS

Name _____

Balance the equations below using the half-reaction method.

1. $Sn^{\circ} + Ag^{+} \rightarrow Sn^{+2} + Ag^{\circ}$

2. $Cr^{\circ} + Pb^{2+} \rightarrow Cr^{+3} + Pb^{\circ}$

3. $KClO_3 \rightarrow KCl + O_2$

4. $NH_3 + O_2 \rightarrow NO + H_2O$

5. $PbS + H_2O_2 \rightarrow PbSO_4 + H_2O$

6. $H_2S + HNO_3 \rightarrow S + NO + H_2O$

7. $MnO_2 + H_2C_2O_4 + H_2SO_4 \rightarrow MnSO_4 + CO_2 + H_2O$

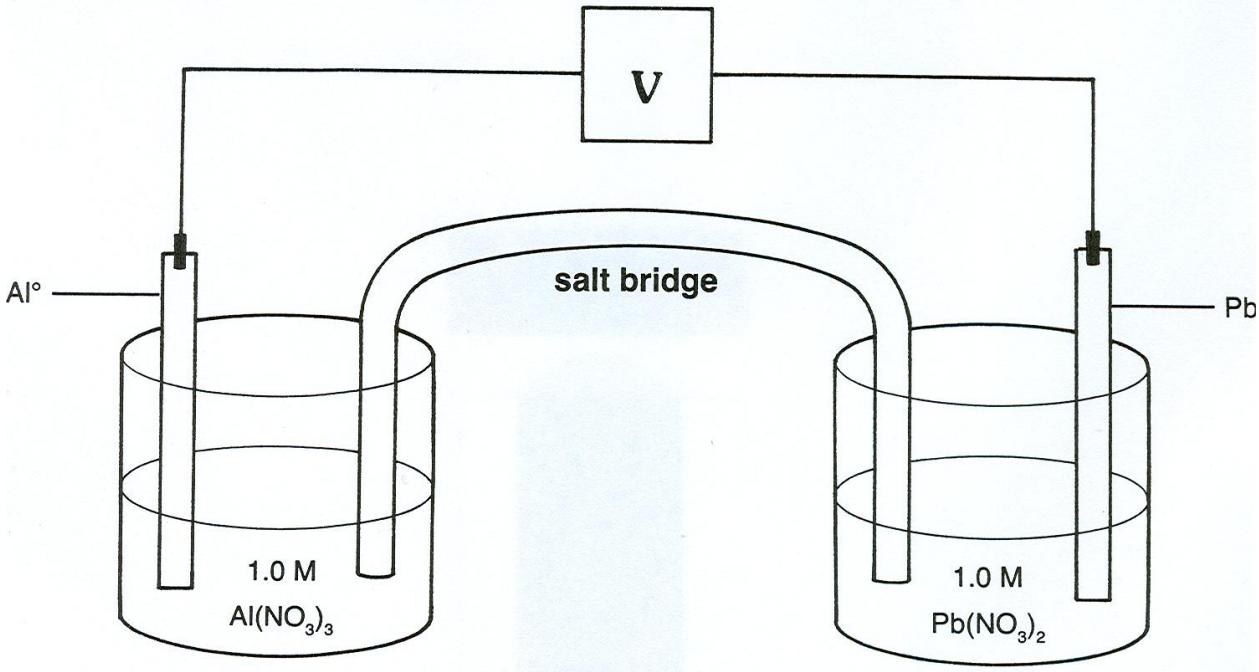
8. $H_2S + H_2SO_3 \rightarrow S + H_2O$

9. $KIO_3 + H_2SO_3 \rightarrow KI + H_2SO_4$

10. $K_2Cr_2O_7 + HCl \rightarrow KCl + CrCl_3 + Cl_2 + H_2O$

THE ELECTROCHEMICAL CELL

Name _____



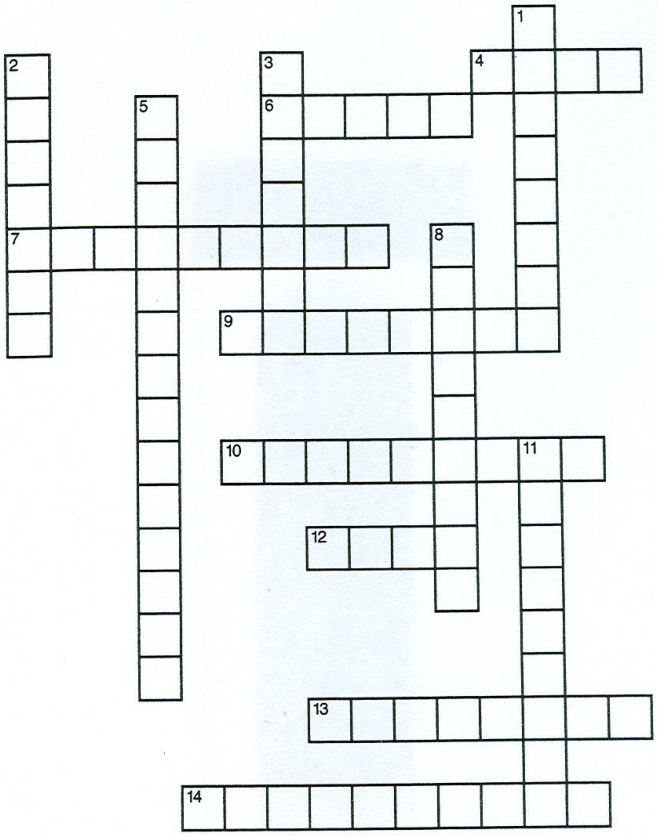
Answer the questions below referring to the above diagram and a Table of Standard Electrode Potentials.

1. Which is more easily oxidized, metal, aluminum or lead? _____
2. What is the balanced equation showing the spontaneous reaction that occurs?

   _____
3. What is the maximum voltage that the above cell can produce? _____
4. What is the direction of electron flow in the wire? _____
5. What is the direction of positive ion flow in the salt bridge? _____
6. Which electrode is decreasing in size? _____
7. Which electrode is increasing in size? _____
8. What is happening to the concentration of aluminum ions? _____
9. What is happening to the concentration of lead ions? _____
10. What is the voltage in this cell when the reaction reaches equilibrium? _____
11. Which is the anode? _____
12. Which is the cathode? _____
13. What is the positive electrode? _____
14. What is the negative electrode? _____

ELECTROCHEMISTRY CROSSWORD

Name _____



ACROSS

4. Unit of electrical potential
6. Electrode where oxidation takes place
7. Both atoms and _____ must be balanced in a redox equation.
9. The anode in an electrochemical cell has this charge.
10. Gain of electrons
12. Voltage of an electrochemical cell when it reaches equilibrium
13. A substance that is oxidized is the _____ agent.
14. Allows the flow of ions in an electrochemical cell

DOWN

1. The anode in an electrolytic cell has this charge.
2. Another word for an electrochemical cell
3. Electrode where reduction takes place
5. Process of layering a metal onto a surface in an electrolytic cell
8. Loss of electrons
11. A substance that is reduced is the _____ agent.