**Redox Reaction**

I. Determine what is oxidized and what is reduced in each reaction. Identify the oxidizing agent and the reducing agent, also.

Oxidized: Reduced: Oxidizing Reducing

Agent: Agent:

1. 2Sr + O2 🡪 2SrO

2. 2Li + S 🡪 Li2S

3. 2Cs + Br2 🡪 2CsBr

4. 3Mg + N2 🡪 Mg3N2

5. 4Fe + 3O2 🡪 2Fe2O3

6. Cl2 + 2NaBr 🡪 2NaCl + Br2

7. Si + 2F2 🡪 SiF4

8. 2Ca + O2 🡪 2CaO

9. Mg + 2HCl 🡪 MgCl2 + H2

10. 2Na + 2H2O 🡪 2NaOH + H2

11. Give the oxidation number of each kind of atom or ion.

a. SO42- b. Sn c. S2- d. Fe3+ e. Sn4+ f. NO3- g. NH4+

12. Calculate the oxidation number of chromium in each of the following.

a. Cr2O3 b. Na2Cr2O7 c. CrSO4 d. CrO42- e. Cr2O72-

13. Use the changes in oxidation numbers to determine which elements are oxidized and which are reduced in these reactions. (Note: it is not necessary to use balanced equations)

a. C + H2SO4 🡪 CO2 + SO2 + H2O

b. HNO3 + HI 🡪 NO + I2 + H2O

c. KMnO4 + HCl 🡪 MnCl2 + Cl2 + H2O + KCl

d. Sb + HNO3 🡪 Sb2O3 + NO + H2O

14. For each reaction in problem 13, identify the oxidizing agent and reducing agent.

15. Write half-reactions for the oxidation and reduction process for each of the following.

Oxidation: Reduction:

a. Fe2+ + MnO4– 🡪 Fe3+ + Mn2+

b. Sn2+ + IO3– 🡪 Sn4+ + I–

c. S2- + NO3– 🡪 S + NO

d. NH3 + NO2 🡪 N2 + H2O

16. Complete and balance each reaction using the half-reaction method. You **MUST** show your work for credit in this section.

a. Fe2+ + MnO4– 🡪 Fe3+ + Mn2+

b. Sn2+ + IO3– 🡪 Sn4+ + I–

c. S2- + NO3– 🡪 S + NO

d. NH3 + NO2 🡪 N2 + H2O

e. Mn2+ + BiO3– 🡪 Bi2+ + MnO4–

f. I2 + Na2S2O3 🡪 Na2S2O4 + NaI

**Answers:**