1. Classify each half-reaction as oxidation or reduction.

(a) $Fe_{(s)} \rightarrow Fe^{2+} + 2e^-$

(b) $2\ I^-_{(aq)} \rightarrow I_{2(s)} + 2e^-$

(c) $Sr^{2+}_{(aq)} + 2e^- \rightarrow Sr_{(s)}$

(d) $Te_{(s)} + 2e^- \rightarrow Te^{2-}_{(aq)}$

2. Write the total ionic, and net ionic equations for:

(a) $2\ Al_{(s)} + 6\ HCl_{(aq)} \rightarrow 3\ H_{2(g)} + 2\ AlCl_{3(aq)}$

(b) $Zn_{(s)} + Cu(NO_3)_{2(aq)} \rightarrow Cu_{(s)} + Zn(NO_3)_{2(aq)}$

(c) $Mg(CH_3COO)_2\ (aq) + Pb(s) \rightarrow Pb(CH_3COO)_2(aq) + Mg(s)$

3. For each net ionic equation from #2 above:
- write the half reactions
- identify the oxidizing agent and the reducing agent

a) oxidation:

reduction:

b) oxidation:

reduction:

c) oxidation:

reduction:

4. Determine the oxidation number for each element in the following:

a) N_2O_4

b) $Ca_3(PO_4)_2$

c) N_2S_4

d) BrO_3^-

e) P_4O_{10}

f) $Al(NO_3)_3$

5. Determine the oxidation number of:

a) S in SO_3

b) Cl in $HClO_2$

c) S in $S_2O_3^{2-}$

d) Cr in CrO_4^{2-}

e) F in CaF_2

6. For each reaction, assign oxidation numbers to the elements to determine whether the reaction is a redox reaction. ***(fractions are possible for Ox. #'s)***

(a) $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow 2\ NaCl_{(aq)} + BaSO_{4(s)}$

(b) $2\ NO_{(g)} + 2\ CO_{(g)} \rightarrow N_{2(g)} + 2\ CO_{2(g)}$

(c) $2\ Na_3N_{(s)} \rightarrow 6\ Na_{(l)} + N_{2(g)}$

(d) $Pb(NO_3)_{2(aq)} + 2\ KI_{(aq)} \rightarrow PbI_{2(s)} + 2\ KNO_{3(aq)}$

(e) $2\ C_4H_{10(g)} + 13\ O_{2(g)} \rightarrow 8\ CO_{2(g)} + 10\ H_2O_{(g)}$

(f) $F_{2(g)} + 2\ BrO_2^-{}_{(aq)} \rightarrow 2\ F^-_{(aq)} + 2\ BrO_2$

7. For each of the redox reactions in #6 above, identify the OA and the RA.