Name: _____

Oxidation and Reduction Reactions

1. On which side of an oxidation half reaction are the electrons?

2. On which side of a reduction half reaction are the electrons?

3. Explain why the oxidizing agent undergoes reduction in a redox reaction.

4. Determine the oxidation states on each element in the substances below.

A) H_2SO_2 B) $Ca(OH)_2$ C) $NaNO_2$ D) K_2S

E) Na_3PO_3 F) $Na_2C_2O_4$ G) $(NH_4)_2Cr_2O_7$ H) HCO_3^{1-}

5. For each of the following reactions:
   - Write a balanced net ionic equation for the reaction.
   - Identify which reactant is oxidized and which one is reduced.
   - Identify which reactant is the oxidizing agent and which one is the reducing agent.
   - Write balanced half reactions for the oxidation and reduction.

a) $Zn_{(s)} + FeCl_{2(aq)} \rightarrow Fe_{(s)} + ZnCl_{2(aq)}$

b) $Zn_{(s)} + Pb(NO_3)_{2(aq)} \rightarrow Pb_{(s)} + Zn(NO_{3)2(aq)}$

c) $3Ag_{(s)} + Au(NO_3)_{3(aq)} \rightarrow Au_{(s)} + 3AgNO_{3(s)}$

d) $3Mg_{(s)} + Al_2(SO_4)_{3(aq)} \rightarrow 2Al_{(s)} + 3MgSO_{4(aq)}$

6. For each of the following reactions:
   - Write the oxidation and reduction half reactions
   - Write the overall redox equation
   - Note: not all of these reactions are redox reactions

a) $CH_4 + O_2 \rightarrow CO_2 + H_2O$

b) $Mn + Cl_2 \rightarrow$

c) $Ca(NO_3)_2 + Na_3PO_4 \rightarrow$

d) $NH_4Br + Cl_2 \rightarrow$

e) $Mg + Fe(SO_4)_3 \rightarrow$