INTRODUCTION TO OXIDATION-REDUCTION

Name

Section

1. a. Identify each of the chemical equations below as to the reaction type (combustion, formation, or decomposition).

Chemical Equation Reaction Type $S(s) + O_2(g) \rightarrow SO_2(g)$ $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$ $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l)$ $2HgO(s) \rightarrow 2Hg(l) + O_2(g)$

- b. Identify two characteristics common to these equations.
- c. Explain the historic interpretation of oxidation and reduction in chemical reactions.
- d. Define the terms oxidation, reduction, oxidizing agent, and reducing agent.

2. Summarize the steps required to balance an oxidation-reduction reaction in aqueous solution.

3. a. Balance the following oxidation-reduction equation:

 $H_{2}S(aq) + HNO_{3}(aq) \rightarrow S(s) + NO(g)$ (acidic solution)

b. Balance the following oxidation-reduction equation:

 $\operatorname{BrO}_3^{-}(aq) + \operatorname{Fe}^{2+}(aq) \to \operatorname{Br}^{-}(aq) + \operatorname{Fe}^{3+}(aq)$ (basic solution)

c. Balance the following oxidation-reduction equation:

 $\mathrm{K}_2\mathrm{S}_5(s)\,+\,\mathrm{HCl}(g)\to\mathrm{H}_2\mathrm{S}(g)\,+\,\mathrm{S}(s)\,+\,\mathrm{KCl}(s) \text{ (acidic solution)}$