Redox Reactions

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

1. $2Sr + O_2 \rightarrow 2SrO$
2. $2Li + S \rightarrow Li_2S$
3. $2Cs + Br_2 \rightarrow 2CsBr$
4. $3Mg + N_2 \rightarrow Mg_3N_2$
5. $4Fe + 3O_2 \rightarrow 2Fe_2O_3$
6. $Cl_2 + 2NaBr \rightarrow 2NaCl + Br_2$

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

7. $Si + 2F_2 \rightarrow SiF_4$
8. $2Ca + O_2 \rightarrow 2CaO$
9. $Mg + 2HCl \rightarrow MgCl_2 + H_2$
10. $2Na + 2H_2O \rightarrow 2NaOH + H_2$

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

a. Sulfate
b. Sn
c. S^{2-}
d. Fe^{3+}
e. Sn^{4+}
f. Nitrate
g. Ammonium

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

a. Cr_2O_3
b. $Na_2Cr_2O_7$
c. $CrSO_4$
d. Chromate
e. Dichromate

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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. $C + H_2SO_4 \rightarrow CO_2 + SO_2 + H_2O$
b. $HNO_3 + HI \rightarrow NO + I_2 + H_2O$
c. $KMnO_4 + HCl \rightarrow MnCl_2 + Cl_2 + H_2O + KCl$
d. $Sb + HNO_3 \rightarrow Sb_2O_3 + NO + H_2O$

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

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

a. $Fe^{2+} + MnO_4^- \rightarrow Fe^{3+} + Mn^{2+}$
b. $Sn^{2+} + IO_3^- \rightarrow Sn^{4+} + I^-$
c. $S^{2-} + NO_3^- \rightarrow S + NO$
d. $NH_3 + NO_2 \rightarrow N_2 + H_2O$

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16. Complete and balance each reaction using the half-reaction method.

a. $Fe^{2+} + MnO_4^- \rightarrow Fe^{3+} + Mn^{2+}$
b. $Sn^{2+} + IO_3^- \rightarrow Sn^{4+} + I^-$
c. $S^{2-} + NO_3^- \rightarrow S + NO$
d. $NH_3 + NO_2 \rightarrow N_2 + H_2O$
e. $Mn^{2+} + BiO_3^- \rightarrow Bi^{3+} + MnO_4^-$
f. $I_2 + Na_2S_2O_3 \rightarrow Na_2S_4O_6 + NaI$

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