Balancing equations chp6 (Homework)

1.
In an ordinary chemical reaction, _____ are neither created nor destroyed.

2.
Balancing an equation for a reaction ensures that the number of each type of atom is _____ on both sides of the equation.

3.
In a chemical equation for a reaction, the notation "(*aq*)" after a substance's formula means that the substance is dissolved in _____.

4.
Ozone gas is a form of elemental oxygen containing molecules with three oxygen atoms, O_3. Ozone is produced from atmospheric oxygen gas O_2, by the high energy outbursts found in lightening storms. Write the unbalanced equation for the formation of ozone gas from oxygen gas. (Type your answer using the format CO2 for CO_2.)

5.
Balance each of the following chemical equations. (Use the lowest possible coefficients.)
(a) $H_2O_2(aq) \rightarrow H_2O(l) + O_2(g)$

(b) $Ag(s) + H_2S(g) \rightarrow Ag_2S(s) + H_2(g)$

(c) $FeO(s) + C(s) \rightarrow Fe(l) + CO_2(g)$

(d) $Cl_2(g) + KI(aq) \rightarrow KCl(aq) + I_2(s)$

(e) $Na_2B_4O_7(s) + H_2SO_4(aq) + H_2O(l) \rightarrow H_3BO_3(s) + Na_2SO_4(aq)$

(f) $CaC_2(s) + H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$

(g) $NaCl(s) + H_2SO_4(l) \rightarrow HCl(g) + Na_2SO_4\ (s)$

(h) $SiO_2(s) + C(s) \rightarrow Si(l) + CO(g)$

6.
Balance each of the following chemical equations. (Use the lowest possible coefficients.)
(a) $CaF_2(s) + H_2SO_4(l) \rightarrow CaSO_4(s) + HF(g)$

(b) $KBr(s) + H_3PO_4(aq) \rightarrow K_3PO_4(aq) + HBr(g)$

(c) $TiCl_4(l) + Na(s) \rightarrow NaCl(s) + Ti(s)$

(d) $K_2CO_3(s) \rightarrow K_2O(s) + CO_2(g)$

(e) $KO_2(s) + H_2O(l) \rightarrow KOH(aq) + O_2(g)$

(f) $Na_2O_2(s) + H_2O(g) + CO_2(g) \rightarrow NaHCO_3(s) + O_2(g)$

(g) $KNO_2(s) + C(s) \rightarrow K_2CO_3(s) + CO(g) + N_2(g)$

(h) $BaO(s) + Al(s) \rightarrow Al_2O_3(s) + Ba(s)$

7.
Balance each of the following chemical equations. (Use the lowest possible coefficients.)
(a) $Ba(NO_3)_2(aq) + Na_2CrO_4(aq) \rightarrow BaCrO_4(s) + NaNO_3(aq)$

(b) $PbCl_2(aq) + K_2SO_4(aq) \rightarrow PbSO_4(s) + KCl(aq)$

(c) $C_2H_5OH(l) + O_2(g) \rightarrow CO_2(g) + H_2O(l)$

(d) $CaC_2(s) + H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$

(e) $Sr(s) + HNO_3(aq) \rightarrow Sr(NO_3)_2(aq) + H_2(g)$

(f) $BaO_2(s) + H_2SO_4(aq) \rightarrow BaSO_4(s) + H_2O_2(aq)$

(g) $AsI_3(s) \rightarrow As(s) + I_2(s)$

(h) $CuSO_4(aq) + KI(s) \rightarrow CuI(s) + I_2(s) + K_2SO_4(aq)$

8.
The Hall process is an important method by which pure aluminum is prepared from its oxide (alumina, Al_2O_3) by indirect reaction with graphite (carbon). Balance the following equation, which is a simplified representation of this process. (Use the lowest possible coefficients.)

9.
Write a chemical equation for the following reaction. (Type your answer using the format CH4 for CH_4.)
The solids aluminum and sulfur react to produce aluminum sulfide.
Classify the reaction into as many categories as possible.

10.
Write a chemical equation for the following reaction. (Type your answer using the format CH4 for CH_4.)
Ethane gas (C_2H_6) burns in air, producing carbon dioxide gas and water vapor.
Classify the reaction into as many categories as possible.

11.
What are five classes of chemical reactions? (10.2)

12.
How would you classify a chemical reaction between two reactants that produces one product? (10.2)

13.
Classify the following chemical reaction. (10.2)
$Mg(s) + FeCl_3(aq) \rightarrow Fe(s) + MgCl_2(aq)$

14.
In each of the following pairs, which element will replace the other in a reaction? (10.2)
(a) tin and sodium

(b) fluorine and iodine

(c) lead and silver

(d) copper and nickel

15.
Classify each of the following reactions.
(a) hydrogen iodide(g) $\rightarrow$hydrogen(g) + iodine(g)
(b) aluminum(s) + iodine(s) $\rightarrow$aluminum iodide(s)
(c) iron(II) oxide(s) + oxygen(g) $\rightarrow$iron(III) oxide(s)

16.
Classify each of the following reactions.
(a) butane (C_4H_{10})(l) + oxygen(g) $\rightarrow$carbon dioxide(g) + water(l)
(b) aluminum carbonate(s) $\rightarrow$aluminum oxide(s) + carbon dioxide(g)
(c) silver nitrate(aq) + sodium sulfide(aq) $\rightarrow$silver sulfide(s) + sodium nitrate(aq)

17.
Classify each of the following reactions. (Select all that apply.)
(a) iron(s) + fluorine(g) $\rightarrow$iron(III) fluoride(s)

(b) sulfur trioxide(g) + water(l) $\rightarrow$sulfuric acid(aq)

(c) sodium(s) + magnesium iodide(aq) $\rightarrow$sodium iodide(aq) + magnesium(s)

(d) vanadium(s) + oxygen(g) $\rightarrow$vanadium(V) oxide(s)

18.
Classify each of the following reactions.
(a) lithium(s) + gold(III) chloride(aq) $\rightarrow$lithium chloride(aq) + gold(s)
(b) iron(s) + tin(IV) nitrate(aq) $\rightarrow$iron(III) nitrate(aq) + tin(s)

(c) nickel(II) chloride(s) + oxygen(g) $\rightarrow$nickel(II) oxide(s) + dichlorine pentoxide(g)
(d) lithium chromate(aq) + barium chloride(aq) $\rightarrow$lithium chloride(aq) + barium chromate(s)