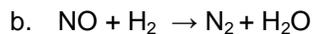
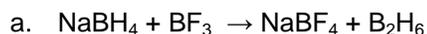


6. Determine the sum of the coefficients for each of the following chemical equations when they are balanced in standard form.



7. Choose the correct symbol written below to describe each of the chemical reactions listed in questions a-i.

S = synthesis

SR = single replacement

D = decomposition

DD = double displacement

C = combustion

Then, complete the equation by writing the correct name of the element or compound in each blank.

_____ a. oxygen + _____ \rightarrow zinc oxide

_____ b. hydrochloric acid solution + calcium hydroxide solution \rightarrow _____ + _____

_____ c. butane (a hydrocarbon)+ oxygen \rightarrow _____ + _____

_____ d. sodium hydroxide + _____ \rightarrow silver hydroxide + sodium nitrate

_____ e. barium acetate + potassium sulfate \rightarrow _____ + _____

_____ f. _____ + _____ \rightarrow copper (II) bromide

_____ g. sodium + magnesium chloride \rightarrow _____ + _____

_____ h. copper (II) oxide \rightarrow _____ + _____

_____ i. methane (a hydrocarbon) + _____ \rightarrow carbon dioxide + water

8. Write balanced formula equations for each reaction in #7. Include states of matter as much as possible.

a.

b.

c. butane = C_4H_{10}

d.

e.

f.

g.

h.

i. methane = CH₄

Which of the above equations represent redox reactions? Which of the above reactions are acid-base reactions?

9. Write a balanced formula equation for each of the following. (Hint: Identify the reaction type first.)
Include as many symbols and states of matter as possible.

_____ a. The formation of solid copper (II) oxide from its elements

_____ b. Combining solutions of aluminum sulfate and iron (II) chloride

_____ c. Burning of gas ethane (C₂H₆) to release lots of energy

_____ d. Reacting solid zinc and liquid bromine

_____ e. Chlorine gas replaces bromide in solid sodium bromide

_____ f. Adding solid ammonium sulfide to sodium chloride solution

_____ g. Making solid magnesium chloride from its elements

_____ h. Reacting solid cobalt with fluorine gas

_____ i. Gaseous nitrogen monoxide reacts with gaseous carbon monoxide to form nitrogen gas and carbon dioxide gas. This reaction is catalyzed by platinum.

Which of the above equations represent redox reactions? Which of the above reactions are acid-base reactions?

10. You wish to make baking soda (sodium hydrogen carbonate). To do so, you bubble carbon dioxide into cold water that contains dissolved ammonia (NH₃) and sodium chloride. The other product is ammonium chloride, which remains dissolved in the water. At high concentrations, the baking soda is not soluble, so you can collect it by filtration. Write a balanced chemical equation (standard form) for this reaction. Include as many states of matter as possible

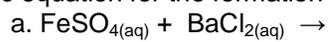
11. Use the table below to predict the products of the following decomposition reactions. Write balanced chemical equations.

Four Kinds of Decomposition Reactions: one compound to make smaller compounds or elements

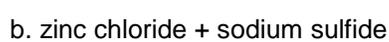
1. (MCO₃) Metallic carbonates decompose into metallic oxides and carbon dioxide.
 $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
 $\text{K}_2\text{CO}_3 \rightarrow \text{K}_2\text{O} + \text{CO}_2$
2. (MOH) Many metallic hydroxides decompose into metallic oxides and water.
 $2 \text{KOH} \rightarrow \text{K}_2\text{O} + \text{H}_2\text{O}$
 $\text{Ca}(\text{OH})_2 \rightarrow \text{CaO} + \text{H}_2\text{O}$
3. (MClO₃) Metallic chlorates decompose into metallic chlorides and oxygen gas.
 $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$
 $\text{Ba}(\text{ClO}_3)_2 \rightarrow \text{BaCl}_2 + 3 \text{O}_2$
- ***4. (XY) Binary (two-element) compounds decompose into two pure elements ***on tests
 $2 \text{HgO} \rightarrow 2 \text{Hg} + \text{O}_2$
 $2 \text{NaCl} \rightarrow 2 \text{Na} + \text{Cl}_2$

- Type _____ a. _____ NaClO₃ → _____ + _____
- Type _____ b. _____ K₂O → _____ + _____
- Type _____ c. _____ NaOH → _____ + _____
- Type _____ d. _____ H₂CO₃ → _____ + _____
- Type _____ e. silver oxide _____ → _____ + _____
- Type _____ f. sodium chloride _____ → _____ + _____

12. For each of the following double displacement reactions, predict the products, identify the precipitant (if one is formed), and write a complete balanced equation showing the states of matter. List the spectator ions and write the net ionic equation for the formation of the precipitate.



net ionic equation: _____ Spectator ions: _____



net ionic equation: _____ Spectator ions: _____

13. Use your activity series to predict whether or not the following single replacement reactions will occur. If the reaction will occur, predict the formulas of the products and write the balanced equation. If the reaction will not occur, write "no reaction."

- $\text{K}_{(s)} + \text{H}_2\text{O}_{(l)} \rightarrow$
- $\text{KCl} + \text{F}_2 \rightarrow$
- $\text{Ag} + \text{Cu}(\text{NO}_3)_2 \rightarrow$
- $\text{MgF}_2 + \text{Br}_2 \rightarrow$
- $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow$