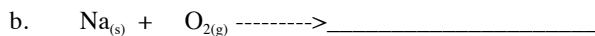


1a. Combustion (or “burning”) is an exothermic reaction with _____.

b. Exothermic reactions _____ energy, and endothermic reactions _____ energy.

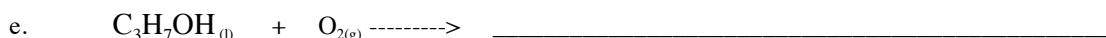
2. Write a balanced chemical equation (with phase subscripts) for each reaction:

a. Magnesium burns: _____



c. Methane burns in a bunsen burner. _____
(Methane (aka “natural gas”) has the formula CH_4)

d. Liquid hexane (C_6H_{14}), one of the compounds found in gasoline, undergoes combustion:



3. Write a balanced equation for each combustion reaction: Include phase subscripts on reactions a-d.



b. Potassium is burned: _____

c. Gasoline burns in your car engine (use C_9H_{20} as an “average” formula for gasoline)

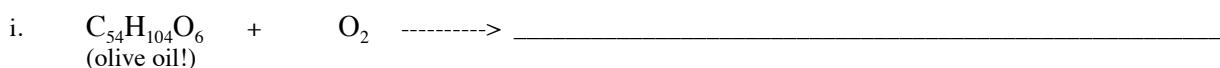
d. Acetylene gas (C_2H_2) burns in a welding torch: _____

e. Coal (Carbon) is combusted. _____

f. Hydrogen gas is combusted. _____

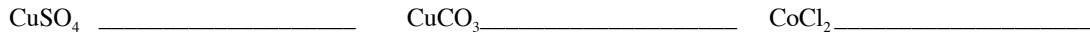
g. Ethanol ($\text{C}_2\text{H}_5\text{OH}$) burns. _____

h. Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) is combusted. _____
(This reaction also occurs during cellular respiration in your body when you “burn sugar.”)



Part II. Solubility chart and phases.

1. Intro and demo: Look up each compound on your solubility chart, and classify each one as “soluble” or “insoluble” into water.



2a. Write the formula, including the phase subscript, for solid copper II sulfate. _____

b. Write the formula, including the phase subscript, for copper II sulfate dissolved in water. _____

c. “Table salt” is the common name for sodium chloride.

Write the formula (including the phase subscript) for sodium chloride, before and after it dissolves into water.
(assume room temperature.)

Sodium chloride before dissolving _____ sodium chloride after dissolving _____

3. Use your solubility chart to classify each compound as “soluble” or “insoluble” in water.

MgSO_4	soluble	insoluble	$\text{Ba}(\text{C}_2\text{H}_5\text{O}_2)_2$	soluble	insoluble
PbSO_4	soluble	insoluble	CuI	soluble	insoluble
CuCl_2	soluble	insoluble	CuI_2	soluble	insoluble
CuCl	soluble	insoluble	Li_2CO_3	soluble	insoluble
K_2S	soluble	insoluble	PbBr_2	soluble	insoluble
AuNO_3	soluble	insoluble	$\text{Mg}(\text{NO}_3)_2$	soluble	insoluble
$(\text{NH}_4)_2\text{S}$	soluble	insoluble	FeSO_3	soluble	insoluble
CuS	soluble	insoluble	FeSO_4	soluble	insoluble
NaOH	soluble	insoluble	K_2SO_3	soluble	insoluble
MgCO_3	soluble	insoluble	K_2SO_4	soluble	insoluble

Part III: Balance each equation, using the lowest possible integer coefficients.

- a. $\text{C}_4\text{H}_8 + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$
- b. $\text{C}_4\text{H}_6 + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$
- c. $\text{K} + \text{HCl} \longrightarrow \text{KCl} + \text{H}_2$
- d. $\text{NO}_2 + \text{H}_2\text{O} \longrightarrow \text{HNO}_3 + \text{NO}$
- e. $\text{Fe} + \text{O}_2 \longrightarrow \text{Fe}_2\text{O}_3$
- f. $\text{H}_2\text{O} + \text{N}_2\text{O}_3 \longrightarrow \text{HNO}_2$
- g. $\text{Al}(\text{NO}_3)_3 + \text{H}_2\text{SO}_4 \longrightarrow \text{Al}_2(\text{SO}_4)_3 + \text{HNO}_3$
- h. $\text{CH}_3\text{OH} + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$
- i. $\text{Fe} + \text{H}_2\text{O} \longrightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$
- j. $\text{Cu} + \text{HNO}_3 \longrightarrow \text{Cu}(\text{NO}_3)_2 + \text{H}_2\text{O} + \text{NO}_2$
- k. $\text{IrCl}_3 + \text{Ca}(\text{OH})_2 \longrightarrow \text{Ir}_2\text{O}_3 + \text{HCl} + \text{CaCl}_2$
- l. $\text{H}_3\text{PO}_4 + \text{CaCO}_3 \longrightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{Ca}_3(\text{PO}_4)_2$
- m. $\text{KClO}_3 \longrightarrow \text{KCl} + \text{O}_2$