

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: \_\_\_\_\_

b.  $\text{Na}_{(s)} + \text{O}_{2(g)} \text{----->}$  \_\_\_\_\_

c. Methane burns in a bunsen burner. \_\_\_\_\_  
(Methane (aka “natural gas”) has the formula  $\text{CH}_4$ )

d. Liquid hexane ( $\text{C}_6\text{H}_{14}$ ), one of the compounds found in gasoline, undergoes combustion:

\_\_\_\_\_

e.  $\text{C}_3\text{H}_7\text{OH}_{(l)} + \text{O}_{2(g)} \text{----->}$  \_\_\_\_\_

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

a.  $\text{Al}_{(s)} + \text{O}_{2(g)} \text{----->}$  \_\_\_\_\_

b. Potassium is burned: \_\_\_\_\_

c. Gasoline burns in your car engine (use  $\text{C}_9\text{H}_{20}$  as an “average” formula for gasoline)

\_\_\_\_\_

d. Acetylene gas ( $\text{C}_2\text{H}_2$ ) 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.”)

i.  $\text{C}_{54}\text{H}_{104}\text{O}_6 + \text{O}_2 \text{----->}$  \_\_\_\_\_  
(olive oil!)

**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.

$\text{CuSO}_4$  \_\_\_\_\_  $\text{CuCO}_3$  \_\_\_\_\_  $\text{CoCl}_2$  \_\_\_\_\_

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.

$\text{MgSO}_4$	soluble	insoluble	$\text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2$	soluble	insoluble
$\text{PbSO}_4$	soluble	insoluble	$\text{CuI}$	soluble	insoluble
$\text{CuCl}_2$	soluble	insoluble	$\text{CuI}_2$	soluble	insoluble
$\text{CuCl}$	soluble	insoluble	$\text{Li}_2\text{CO}_3$	soluble	insoluble
$\text{K}_2\text{S}$	soluble	insoluble	$\text{PbBr}_2$	soluble	insoluble
$\text{AuNO}_3$	soluble	insoluble	$\text{Mg}(\text{NO}_3)_2$	soluble	insoluble
$(\text{NH}_4)_2\text{S}$	soluble	insoluble	$\text{FeSO}_3$	soluble	insoluble
$\text{CuS}$	soluble	insoluble	$\text{FeSO}_4$	soluble	insoluble
$\text{NaOH}$	soluble	insoluble	$\text{K}_2\text{SO}_3$	soluble	insoluble
$\text{MgCO}_3$	soluble	insoluble	$\text{K}_2\text{SO}_4$	soluble	insoluble

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

