OER 7.4 Score: _____/40
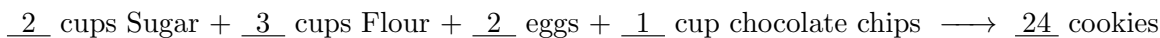
Name: _____ Date: _____

[6 pt] 1. You are baking chocolate chip cookies! You have the following available: 8 cups Sugar, 15 cups Flour, 1 dozen eggs and 5 cups of chocolate chips. The following wonderful recipe is being used:

$\underline{\ 2\ }$ cups Sugar + $\underline{\ 3\ }$ cups Flour + $\underline{\ 2\ }$ eggs + $\underline{\ 1\ }$ cup chocolate chips $\longrightarrow$ $\underline{\ 24\ }$ cookies

(a) What is the limiting ingredient? 1(a) _____

(b) Amount of Sugar left over: 1(b) _____

(c) Amount of Flour left over: 1(c) _____

(d) Amount of Eggs left left over: 1(d) _____

(e) Amount of chocolate chips left over: 1(e) _____
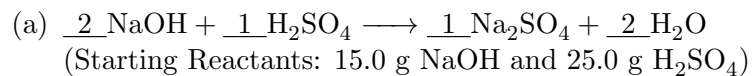
(f) Number of cookies made: 1(f) _____

[4 pt] 2. If 3.0 moles of C_3H_8 and 10.0 moles of O_2 are placed in a closed container and react to completion (until one reactant is used up), how many moles of each compound are present at the end?

$\underline{\ 1\ } C_3H_8 + \underline{\ 5\ } O_2 \longrightarrow \underline{\ 3\ } CO_2 + \underline{\ 4\ } H_2O$
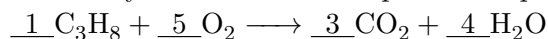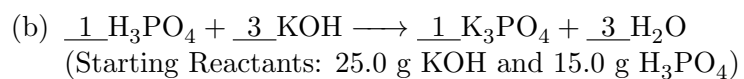
(a) Moles of C_3H_8 present: 2(a) _____

(b) Moles of O_2 present: 2(b) _____

(c) Moles of CO_2 present: 2(c) _____

(d) Moles of H_2O present: 2(d) _____

[4 pt] 3. Determine the limiting reactant. Show work to support your answer.

(a) _2_ NaOH + _1_ H$_2$SO$_4$ $\longrightarrow$ _1_ Na$_2$SO$_4$ + _2_ H$_2$O
    (Starting Reactants: 15.0 g NaOH and 25.0 g H$_2$SO$_4$)   3(a) _____

(b) _1_ H$_3$PO$_4$ + _3_ KOH $\longrightarrow$ _1_ K$_3$PO$_4$ + _3_ H$_2$O
    (Starting Reactants: 25.0 g KOH and 15.0 g H$_3$PO$_4$)   3(b) _____

[4 pt] 4. The reaction for the combustion of propane is: _1_ C$_3$H$_8$ + _5_ O$_2$ $\longrightarrow$ _3_ CO$_2$ + _4_ H$_2$O

(a) If 10.0 grams of C$_3$H$_8$ and 20.0 grams of O$_2$ are reacted, how
    many grams of CO$_2$ can be produced?   4(a) _____

(b) If 15.0 grams of C$_3$H$_8$ and 75.0 grams of O$_2$ are reacted, how
    many grams of CO$_2$ can be produced?   4(b) _____

[22 pt] 5. When a solution containing 12.0 g of lead (II) nitrate and a solution containing 15.0 g of sodium iodide are mixed a yellow precipitate is formed and the reaction produces 150 kJ of energy per mol of lead (II) nitrate reacted. Show all work (label each part), use the back of the page or attach an additional sheet of paper if required.

(a) Write the balanced equation for the reaction below. Include the proper amount of heat as a product.

(b) What class of reaction occurred?   5(b) ——————

(c) What was the limiting reactant?   5(c) ——————

(d) How much (in grams) of the excess reagent is left over?   5(d) ——————

(e) What is the theoretical yield (in grams) of the solid precipitate?   5(e) ——————

(f) When the experiment is performed in lab, 10.5 g of the solid precipitate
     was produced. What is the % yield?   5(f) ——————

(g) How many grams of the other product is produced?   5(g) ——————

(h) How much heat is produced in the reaction?   5(h) ——————

(i) Does your answer satisfy Lavoisier? Prove it!   5(i) ——————