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CHE 101 - Homework - Ch 6c
Limiting and Excess Reactants

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:

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

(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) _____

[5 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) _____

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

(a) $\_2\_ NaOH + \_1\_ H_2SO_4 \longrightarrow \_1\_ Na_2SO_4 + \_2\_ H_2O$
(Starting Reactants: 15.0 g NaOH and 25.0 g H_2SO_4) 3(a) _____

(b) $\_1\_ H_3PO_4 + \_3\_ KOH \longrightarrow \_1\_ K_3PO_4 + \_3\_ H_2O$
(Starting Reactants: 25.0 g KOH and 15.0 g H_3PO_4) 3(b) _____

[5 pt] 4. The reaction for the combustion of propane is: $\_1\_ C_3H_8 + \_5\_ O_2 \longrightarrow \_3\_ CO_2 + \_4\_ H_2O$

(a) If 10.0 grams of C_3H_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_3H_8 and 75.0 grams of O_2 are reacted, how many grams of CO_2 can be produced? 4(b) _____

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[19 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.

(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 much heat is produced in the reaction? 5(g) _____

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