/40

- ✱ No work = Zero pts!
- ✱ if work: 1pt work, 1pt answer, 1pt units

Name:
Date: CALVIN
Hour:

Chemistry Ch.12 Quiz ~ Stoichiometry

1) **Sodium azide is activated in an automobile airbag, producing nitrogen gas and sodium (unbalanced equation):**

1pt $\underset{5.00\,mol}{2}\ NaN_3 \rightarrow \underline{2}\ Na + \underline{3}\ N_2$

If 0.500 mol of NaN_3 react, how many moles of each product would be produced?

3pts $\dfrac{5.00\ mol\ NaN_3}{2\ mol\ NaN_3} \left| \dfrac{2\ mol\ Na}{} \right. = 5.00\ mol\ Na$

3pts $\dfrac{5.00\ mol\ NaN_3}{2\ mol\ NaN_3} \left| \dfrac{3\ mol\ N_2}{} \right. = 7.50\ mol\ N_2$

2) **Butane (C_4H_{10}) in a lighter undergoes combustion.**

a) **Write the balanced reaction.**

2pts $2\ C_4H_{10} + 13\ O_2 \rightarrow \overset{8}{4}\ CO_2 + \overset{10}{5}\ H_2O$

b) **How many grams of butane are required to produce 3.00 moles of Water vapor?**

3pts $\dfrac{3.00\ mol\ H_2O}{10\ mol\ H_2O} \left| \dfrac{2\ mol\ C_4H_{10}}{1\ mol\ C_4H_{10}} \right| \dfrac{58.14\ g\ C_4H_{10}}{} = 34.9\ g\ C_4H_{10}$

c) **How many moles of Carbon Dioxide can be produced from 2.00 g of Butane?**

3pts $\dfrac{2.00\ g\ C_4H_{10}}{58.14\ g\ C_4H_{10}} \left| \dfrac{1\ mol\ C_4H_{10}}{2\ mol\ C_4H_{10}} \right| \dfrac{8\ mol\ CO_2}{} = 0.138\ mol\ CO_2$

3) If excess Calcium Phosphate reacts with 6.89 g of Aluminum Bromide, find the mass of Aluminum Phosphate that would be expected.

2pts $\underline{1}\ Ca_3(PO_4)_2 + \underset{6.89\,g}{\underline{2}}\ AlBr_3 \rightarrow \underset{x\,g}{\underline{2}}\ AlPO_4 + \underline{3}\ CaBr_2$

3pts $\dfrac{6.89\ g\ AlBr_3}{266.68\ g\ AlBr_3} \left| \dfrac{1\ mol\ AlBr_3}{2\ mol\ AlBr_3} \right| \dfrac{2\ mol\ AlPO_4}{1\ mol\ AlPO_4} \left| \dfrac{121.95\ g\ AlPO_4}{} \right. = 3.15\ g\ AlPO_4$

4) How could you recognize a problem as a limiting reactant problem?

1 pt

amounts given for two (both) reactants

5) 5.00 moles of Sodium react with 5.00 moles of Chlorine to form Sodium Chloride. Find a) the limiti reactant, b) the moles of excess reactant, and c) the moles of product.

5 pts

LR XS

2 Na + 1 Cl_2 → 2 NaCl

5.00 mol 5.00 mol

$5.00\ mol\ Na \left| \frac{2\ mol\ NaCl}{2\ mol\ Na} \right. = 5.00\ mol\ NaCl$

$5.00\ mol\ Cl_2 \left| \frac{2\ mol\ NaCl}{1\ mol\ Cl_2} \right. = 10.0\ mol\ NaCl$

Have 5.00 Need

$5.00\ mol\ Na \left| \frac{1\ mol\ Cl_2}{2\ mol\ Na} \right. = 2.50\ mol\ Cl_2$

a) Na

b) 2.50 mol Cl_2

2.50 mol Cl_2 excess

c) 5.00 mol NaCl

6) Consider the following reaction:

Suppose a solution containing 5.30g of Lithium Sulfate is mixed with a solution containing 4.60g Potassium Bromide.

5 pts

SHOW YOUR WORK for finding the limiting reactant.

XS LR

1 $Li_2(SO_4)$ + 2 KBr → 1 $K_2(SO_4)$ + 2 LiBr

5.30 g 4.60 g

option B

$5.30\ g\ Li_2SO_4 \left| \frac{1\ mol\ Li_2SO_4}{109.94\ g\ Li_2SO_4} \right. \left| \frac{2\ mol\ KBr}{1\ mol\ Li_2SO_4} \right. \left| \frac{119.00\ g\ KBr}{1\ mol\ KBr} \right. = 11.5\ g\ KBr$ Need

LR is KBr

7) 18.0g of Nitrogen reacts with excess Hydrogen to form 13.5g Ammonia. Find the percent yield.

5 pts

$$\%\ yield = \frac{actual}{theoretical} \times 100 = \frac{13.5}{21.9} \times 100 = 61.6\%$$

13.5 g

1 N_2 + 3 H_2 → 2 NH_3

18.0 g

$18.0\ g\ N_2 \left| \frac{1\ mol\ N_2}{28.02\ g\ N_2} \right. \left| \frac{2\ mol\ NH_3}{1\ mol\ N_2} \right. \left| \frac{17.04\ g\ NH_3}{1\ mol\ NH_3} \right. = 21.9\ g\ NH_3$

BONUS

2 pts

NIVJA)