STOICHIOMETRIC PROBLEMS #2B

PLEASE NOTE THAT ALL EQUATIONS NEED TO BE BALANCED FIRST!

1. For the reaction:

Determine the mass of butane that would be required to produce 100.0 g of water.

2. Give the reaction

What amount of oxygen gas would you expect to get from the decomposition of 2.50 mol of potassium chlorate

3. For the reaction:

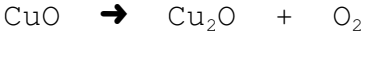
What mass of calcium phosphate would you expect to from if 80.00 g of calcium nitrate was used in the reaction? What mass of potassium phosphate would be required to make this work? What mass of potassium nitrate would form as well? Yes this is three separate question and three separate lines! Use four significant figures for this calculation.

4. For the above question what is the sum of the reactant masses? What is the sum of the product masses? Why are these two sums the same (or close to the same). Please use three lines when added the reactants and adding the products (one line for what you are going to add, one line for the numbers and a third line for the answer).

5. Given the following equation:

What mass of aluminum hydroxide would you expect to get if 25.0 g of aluminum oxide were reacted.

6. For the reaction:



35.0 g of copper(II) oxide is reacted. What mass of Copper(I) oxide would you expect to form?

7. Given the decomposition reaction:

$$Ca(ClO_3)_2 \rightarrow CaCl_2 + O_2$$

If 11.0 mole of calcium chlorate is decomposed what amount of oxygen would you expect to get and what mass of calcium chloride would you expect to get

8. Given this single replacement reaction:

$$Cu + AgNO_3 \rightarrow Cu(NO_3)_2 + Ag$$

How many moles of Cu are needed to fully react with 1.25 moles of $AgNO_3$? If 132 g of Ag are produced, what mass of silver nitrate was reacted

9. Molten iron and carbon monoxide are produced in a blast furnace by the reaction of iron(III) oxide and coke (pure carbon). If 25.0 kilograms of pure Fe_2O_3 is used, how many kilograms of iron can be produced? The reaction is:

$$Fe_2O_3 + C \rightarrow Fe + CO$$

10. The average human brain consumes 120.0 grams of glucose ($C_6H_{12}O_6$) per day. How many grams of CO_2 are exhaled per day, just to keep your brain functioning. Use the cellular respiration reaction to figure this out:

$$C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$$

Why is the mass of CO_2 formed more than the mass of glucose used?

11. Given the reaction:

$$NH_3 + O_2 \rightarrow NO + H_2O$$

What mass of water is produces when 14.0 g of ammonia (NH_3) is reacted. What amount of oxygen is required for this.

Answers:

1. 64.53 g C_4H_{10}
2. 3.75 mol O_2
3. 50.41 g $Ca_3(PO_4)_2$
   68.99 g K_3PO_4
   98.58 g KNO_3
4. 148.99 g reactants
   148.99 g products
5. 38.3 g $Al(OH)_3$
6. 31.5 g Cu_2O
7. 33.0 mol O_2
   1220 g $CaCl_2$
8. 0.625 mol Ca
   208 g $AgNO_3$
9. 17.5 kg Fe
10. 176 g CO_2
11. 22.2 g H_2O
    1.03 mol O_2