Stoichiometry Worksheet

1. Glucose is used as a source of energy by the human body. The reaction in the body is
   $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
   Calculate the number of grams of oxygen needed to oxidize 12.5 g of glucose to carbon dioxide and water.

2. Ammonia is synthesized from hydrogen and nitrogen according to the following equation.
   $N_2 + 3H_2 \dashrightarrow 2NH_3$
   If an excess of nitrogen is reacted with 3.41 g of hydrogen, how many grams of ammonia can be produced?

3. Assume that in the decomposition of potassium chlorate, $KClO_3$, 80.5 g of O_2 form. How many grams of potassium chloride, the other product would be formed?

4. In a single displacement reaction, 9.23 g of aluminum react with excess hydrochloric acid. How many grams of hydrogen will be produced?

5. The compound " cisplatin" $PtCl_2(NH_3)_2$, has been found to be effective in treating some types of cancer. It can be synthesized using the following reaction
   $K_2PtCl_4 + 2NH_3 \dashrightarrow 2KCl + PtCl_2(NH_3)_2$
   a. How much "cisplatin" can be produced from 2.50 g K_2PtCl_4 and excess NH_3?
   b. How much NH_3 would be needed?

6. In the decomposition of sodium chlorate, 31.7 g of O_2 are formed. How many grams of sodium chloride are produced?

7. The action of carbon monoxide on iron(III) oxide can be represented by the equation,
   i. $Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(s) + 3CO_2(g)$.
   What is the minimum amount of carbon monoxide used if 57.5 grams of iron were produced?

8. Claude-Louis Berthollet first prepared ethyne (acetylene) by sparking carbon electrodes in hydrogen gas.
   $2C + H_2 \text{ -> } C_2H_2$
   How many grams of carbon electrode will be consumed when 59.8 grams of acetylene are produced?

9. In space vehicles, air purification for the crew is partly accomplished with the use of lithium peroxide, Li_2O_2. It reacts with waste CO_2 in the air according to the reaction
   $2Li_2O_2 + 2CO_2 \rightarrow 2Li_2CO_3 + O_2$.
   How many grams of oxygen are released by the reaction of 0.905g CO_2?