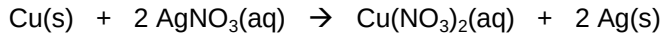
Name: _____
Hour: ____ Date: _____

Chemistry: *Limiting Reactant Problems*

Directions: *Solve each of the following problems. Show your work, including proper units, to earn full credit.*

1. According to the balanced chemical equation, how many atoms of silver will be produced from combining 100 g of copper with 200 g of silver nitrate?



$$Cu(s) + 2\ AgNO_3(aq) \rightarrow Cu(NO_3)_2(aq) + 2\ Ag(s)$$

2. At STP, what volume of "laughing gas" (dinitrogen monoxide) will be produced from 50 g of nitrogen gas and 75 g of oxygen gas?

3. Carbon monoxide can be combined with hydrogen to produce methanol, CH_3OH. Methanol is used as an industrial solvent, as a reactant in some synthesis reactions, and as a clean-burning fuel for some racing cars. If you had 152.5 kg of carbon monoxide and 24.5 kg of hydrogen gas, how many kilograms of methanol could be produced?

4. How many grams of water will be produced from 50 g of hydrogen and 100 g of oxygen?

Answers: 1. 7.1×10^{23} atoms Ag 2. 40 dm^3 N_2O 3. 174.3 kg CH_3OH 4. 112.5 g H_2O

5. An unbalanced chemical equation is given as: ___N_2H_4(l) + ___N_2O_4(l) → ___N_2(g) + ___H_2O(l).
If you begin with 400 g of N_2H_4 and 900 g of N_2O_4…

A. Find the number of liters of water produced, assuming the reaction goes to completion.

B. Find the number of liters of nitrogen produced at STP, assuming the reaction goes to completion.

C. Find the mass of excess reactant left over at the conclusion of the reaction.

6. An unbalanced chemical equation is given as: ___Na(s) + ___O_2(g) → ___Na_2O(s)
If you have 100 g of sodium and 60 g of oxygen…

A. Find the number of moles of sodium oxide produced.

B. Find the mass of excess reactant left over at the conclusion of the reaction.

Answers: 5A. 0.45 L H_2O(l) 5B. 420 L N_2(g) 5C. 325 g N_2O_4(l) 6A. 2.17 mol Na_2O(s) 6B. 25.2 g O_2(g)