Name:		
Hour:	 Date:	

## Chemistry: Stoichiometry - Problem Sheet 2

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

1.  $\underline{\qquad}$  CaCl<sub>2</sub> +  $\underline{\qquad}$  AgNO<sub>3</sub>  $\rightarrow$   $\underline{\qquad}$  Ca(NO<sub>3</sub>)<sub>2</sub> +  $\underline{\qquad}$  AgCl

How many grams of silver chloride are produced when 45 g of calcium chloride react with excess silver nitrate?

2. \_\_\_ CuO + \_\_\_  $H_2 \rightarrow$  \_\_\_ Cu + \_\_\_  $H_2O$ 

At STP, how many liters of hydrogen are needed to react with 88 g of copper (II) oxide?

3.  $\underline{\hspace{1cm}}$  Na +  $\underline{\hspace{1cm}}$  H<sub>2</sub>O  $\xrightarrow{\hspace{1cm}}$  NaOH +  $\underline{\hspace{1cm}}$  H<sub>2</sub>

If 3 liters of hydrogen (at STP) are produced in the above reaction, what mass of sodium was used?

4.  $\_\_CH_4 + \_\_O_2 \rightarrow \_\_CO_2 + \_\_H_2O$ 

What volume of methane is needed to completely react with 500 liters of oxygen?

5.  $CS_2 + CO_2 \rightarrow CO_2 + SO_2$ 

How many molecules of carbon disulfide will react with 4.21 x 10<sup>19</sup> molecules of oxygen?

6.  $C_2H_6 \rightarrow C_2H_4 + C_2H_4$ 

If 5.76 x 10<sup>28</sup> molecules of ethane are broken down, what volume of hydrogen gas is produces at STP?

7. \_\_\_ Fe + \_\_\_  $H_2O \rightarrow$  \_\_\_  $Fe_3O_4 +$  \_\_\_  $H_2$ 

If 67.8 dm<sup>3</sup> of hydrogen are produced at STP, how many atoms of iron were used in the reaction?

8.  $\underline{\hspace{1cm}}$  KCIO<sub>3</sub>  $\rightarrow$   $\underline{\hspace{1cm}}$  KCI +  $\underline{\hspace{1cm}}$  O<sub>2</sub>

If 8.65 x 10<sup>25</sup> molecules of potassium chloride are produced, what mass of oxygen is produced?

9.  $\_$  Nal +  $\_$  Cl<sub>2</sub>  $\rightarrow$   $\_$  NaCl +  $\_$  l<sub>2</sub>

How many molecules of iodine are liberated if 546 g of chlorine react with excess sodium iodide?

10.  $\_$  Cu +  $\_$  AgNO<sub>3</sub>  $\rightarrow$   $\_$  Cu(NO<sub>3</sub>)<sub>2</sub> +  $\_$  Ag

How many grams of silver will be produced if 86 g of copper are used?

 $(NH_4)_2SO_4 + Ca(OH)_2 \rightarrow CaSO_4 + NH_3 + H_2O$ 11.

At STP, how many dm<sup>3</sup> of ammonia are produced by using 26.0 g of calcium hydroxide?

12.  $\_$  NaCl +  $\_$  H<sub>2</sub>SO<sub>4</sub>  $\rightarrow$   $\_$  HCl +  $\_$  Na<sub>2</sub>SO<sub>4</sub>

> If 359 g of sodium chloride are consumed in the reaction, how many molecules of sodium sulfate are produced?

 $\_$  AgCH<sub>3</sub>COO +  $\_$  Na<sub>3</sub>PO<sub>4</sub>  $\rightarrow$   $\_$  Ag<sub>3</sub>PO<sub>4</sub> +  $\_$  NaCH<sub>3</sub>COO 13.

What mass of AgCH<sub>3</sub>COO will react with 4.77 x 10<sup>26</sup> molecules of sodium phosphate?

 $\longrightarrow$  HgO  $\rightarrow$   $\longrightarrow$  Hg +  $\longrightarrow$  O<sub>2</sub> 14.

What mass of mercury (II) oxide is required to produce 812 liters of oxygen (at STP)?

 $\_\_Ag_2O \rightarrow \_\_Ag + \_\_O_2$ 15.

How many molecules of silver oxide are needed to produce 445 dm<sup>3</sup> of oxygen (at STP)?

16.  $\_$  Al +  $\_$  HCl  $\rightarrow$   $\_$  AlCl<sub>3</sub> +  $\_$  H<sub>2</sub>

> How many liters of hydrogen (at STP) are produced by reacting 3.54 x 10<sup>24</sup> atoms of aluminum with excess hydrochloric acid?

1. 116 g AgCl Answers:

2. 24.8 L H<sub>2</sub>

5.  $1.40 \times 10^{19}$  molecules CS<sub>2</sub> 9.  $4.63 \times 10^{24}$  molecules I<sub>2</sub> 13.  $3.97 \times 10^{5}$  g AgCH<sub>3</sub>COO 6.  $2.14 \times 10^{6}$  L H<sub>2</sub> 10. 292 g Ag 14.  $1.57 \times 10^{4}$  g HgO 7.  $1.37 \times 10^{24}$  atoms Fe 11. 15.7 dm<sup>3</sup> NH<sub>3</sub> 15.  $2.39 \times 10^{25}$  molecules Ag 8. 6897 g O<sub>2</sub> 12.  $1.85 \times 10^{24}$  molecules 16. 198 L H<sub>2</sub> 14. 1.57 x 10<sup>4</sup> g HgO 15. 2.39 x 10<sup>25</sup> molecules Ag<sub>2</sub>O 3. 6.2 g Na

8. 6897 g O<sub>2</sub> 4. 250 L CH<sub>4</sub> 12. 1.85 x 10<sup>24</sup> molecules 16. 198 L H<sub>2</sub>