# 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. \_\_\_ CaCl2 + \_\_\_ AgNO3 🡪 \_\_\_ Ca(NO3)2 + \_\_\_ AgCl

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

2. \_\_\_ CuO + \_\_\_ H2 🡪 \_\_\_ Cu + \_\_\_ H2O

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

3. \_\_\_ Na + \_\_\_ H2O 🡪 \_\_\_ NaOH + \_\_\_ H2

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

4. \_\_\_ CH4 + \_\_\_ O2 🡪 \_\_\_ CO2 + \_\_\_ H2O

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

5. \_\_\_ CS2 + \_\_\_ O2 🡪 \_\_\_ CO2 + \_\_\_ SO2

How many molecules of carbon disulfide will react with 4.21 x 1019 molecules of oxygen?

6. \_\_\_ C2H6 🡪 \_\_\_ C2H4 + \_\_\_ H2

If 5.76 x 1028 molecules of ethane are broken down, what volume of hydrogen gas is produces at STP?

7. \_\_\_ Fe + \_\_\_ H2O 🡪 \_\_\_ Fe3O4 + \_\_\_ H2

If 67.8 dm3 of hydrogen are produced at STP, how many atoms of iron were used in the reaction?

8. \_\_\_ KClO3 🡪 \_\_\_ KCl + \_\_\_ O2

If 8.65 x 1025 molecules of potassium chloride are produced, what mass of oxygen is produced?

9. \_\_\_ NaI + \_\_\_ Cl2 🡪 \_\_\_ NaCl + \_\_\_ I2

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

10. \_\_\_ Cu + \_\_\_ AgNO3 🡪 \_\_\_ Cu(NO3)2 + \_\_\_ Ag

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

11. \_\_\_ (NH4)2SO4 + \_\_\_ Ca(OH)2 🡪 \_\_\_ CaSO4 + \_\_\_ NH3 + \_\_\_ H2O

At STP, how many dm3 of ammonia are produced by using 26.0 g of calcium hydroxide?

12. \_\_\_ NaCl + \_\_\_ H2SO4 🡪 \_\_\_ HCl + \_\_\_ Na2SO4

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

13. \_\_\_ AgCH3COO + \_\_\_ Na3PO4 🡪 \_\_\_ Ag3PO4 + \_\_\_ NaCH3COO

What mass of AgCH3COO will react with 4.77 x 1026 molecules of sodium phosphate?

14. \_\_\_ HgO 🡪 \_\_\_ Hg + \_\_\_ O2

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

15. \_\_\_ Ag2O 🡪 \_\_\_ Ag + \_\_\_ O2

How many molecules of silver oxide are needed to produce 445 dm3 of oxygen (at STP)?

16. \_\_\_ Al + \_\_\_ HCl 🡪 \_\_\_ AlCl3 + \_\_\_ H2

How many liters of hydrogen (at STP) are produced by reacting 3.54 x 1024 atoms of aluminum with excess hydrochloric acid?

Answers: 1. 116 g AgCl 5. 1.40 x 1019 molecules CS2 9. 4.63 x 1024 molecules I2 13. 3.97 x 105 g AgCH3COO

2. 24.8 L H2 6. 2.14 x 106 L H2 10. 292 g Ag 14. 1.57 x 104 g HgO

3. 6.2 g Na 7. 1.37 x 1024 atoms Fe 11. 15.7 dm3 NH3 15. 2.39 x 1025 molecules Ag2O

4. 250 L CH4 8. 6897 g O2 12. 1.85 x 1024 molecules 16. 198 L H2