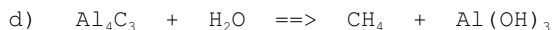
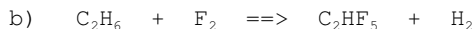
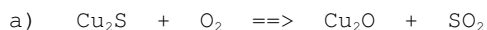


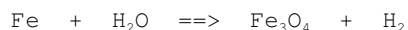
STOICHIOMETRIC PROBLEMS

SHEET #4

1. Balance the following skeleton equation:



2. Steam when passed over hot iron filings reacts as shown in the following equation:



How many liters of hydrogen gas at S.T.P. would be obtained if 16.8 g of iron were completely converted to iron oxide?

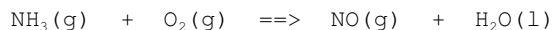
3. Butane gas (C_4H_{10}), when burnt in air, yields carbon dioxide and water.

a) What mass of oxygen is required for the complete combustion of 11 g of butane?

b) What volume of carbon dioxide (at S.T.P.) is produced by the combustion of 11 g of butane?

4. In one method for the production of zinc metal, the compound zinc sulphide (wurtzite) is heated with oxygen to form zinc oxide and sulphur dioxide. In the second step, the zinc oxide is heated with carbon to form zinc metal and carbon monoxide. If a sample of zinc sulphide weighs 150.0 g, how much zinc metal can be produced?

5. What volume of oxygen gas at S.T.P. is required to react with one mole of ammonia according to the following equation?



How many liters of NO are formed at S.T.P.?

6. How many grams of benzene (C_6H_6) are required to react with 25.0 L of oxygen at S.T.P. in a combustion reaction.

7. What mass of hydrogen is required to produce 5.00 L of ammonia at S.T.P. when hydrogen gas is reacted with nitrogen gas.

8. What volume of oxygen is formed at 100 °C and 1 atm. pressure when 125 g of potassium chlorate is thermally decomposed to yield potassium chloride and oxygen gas?

9. Given: $\text{Fe}_2\text{O}_3 + \text{CO} \implies \text{Fe}_3\text{O}_4 + \text{CO}_2$

How many grams of Fe_2O_3 can be converted to Fe_3O_4 by 14.0 g of CO

Answers:

2. 8.98 L H_2	6. 11.6 g C_6H_6
3. 39.4 g O_2 , 17.0 L CO_2	7. 0.670 g H_2
4. 101 g	8. 46.8 L O_2
5. 28.0 L O_2 , 22.4 L NO	9. 239 g Fe_2O_3