1. Consider the following chemical reaction:

2H2(g) + O2(g) → 2H2O(l)

1. How many moles of H2 and O2 is needed to produce 12 moles of water? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many moles of H2 and O2 is needed to produce 24 mol of water? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How many grams of H2 and O2 would be needed to produce 12 grams of water?
4. How many litres of H2 and O2 (at STP) would be needed to produce 12 grams of water?
5. How many moles of hydrogen are required to react with 2.50 moles of oxygen to produce water?
6. How many moles of calcium oxide are produced when 36.5 g of calcium reacts completely with oxygen gas?
7. Consider the following reaction at STP:

2C2H2(g) + 5O2(g) → 4CO2(g) + 2H2O(g)

1. An acetylene (C2H2) sample contains 1.456 x 1024 molecules. How many moles of O2 are needed to completely react with all of the molecules of acetylene?
2. What volume of acetylene is needed to produce 56.0 grams of water? (Assume enough O2 is present)
3. Consider the following reaction at STP:

N2(g) + 3H2(g) → 2NH3(g)

1. How many litres of N2 would be needed to produce 10 litres of NH3?
2. How many grams of N2 and how many grams of H2 would be needed to produce 10.5 L of NH3?
3. Suppose you need 1.00 kg of NH3 to be used to make fertilizer. How many litres of N2 and H2 would you need to react together?
4. How many grams of chlorine are required to produce 355 g of carbon tetrachloride by reacting with solid carbon?
5. 56.8 g of phosphorus pentachloride decomposed into phosphorus trichloride and chlorine gas. How many grams of each product has formed?
6. Hydrogen sulphide reacts with potassium permanganate to produce potassium sulphate, manganese (lV) oxide, potassium hydroxide, and water. How many grams of hydrogen sulphide must be used to react completely with 6.32 g of potassium permanganate?
7. Consider the reaction 4NH3(g) + 5O2(g) → 6H2O(g) + 4NO(g). What volume of NH3(g) at STP is required to react with 3.00 mol of O2(g)?
8. Consider the reaction 4NH3(g) + 5O2(g) → 6H2O(g) + 4NO(g). What volume of NH3(g) at STP is required to produce 0.750 mol of H2O(g)?
9. Tetraethyl lead, Pb(C2H5)4 burns according to the equation

2Pb(C2H5)4(l) + 27O2(g) → 2PbO(s) + 16CO2(g) + 20H­2O(l)

1. What volume of O2(g) at STP is consumed when 100.0 g of PbO(s) are formed?
2. How many molecules of CO2(g) are formed at STP when 1.00 g of tetraethyl lead is burned?
3. How many molecules of H2O(l) are formed when 135 molecules of O2(g) react?
4. What volume of O2(g) at STP, in mL, is required to react with 1.00 x 1015 molecules of tetraethyl lead?
5. A bicycle was left in the rain and was coated with 67.9 g of Fe2O3. What mass of Fe reacted, and what mass of O2 from the atmosphere combined with that iron?