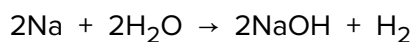


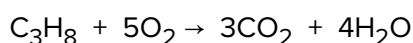
## CHEMISTRY CALCULATIONS WS 2

### Moles & Mass

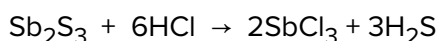
- 1 How many moles of hydrogen gas are produced when 0.4 moles of sodium react with excess water?



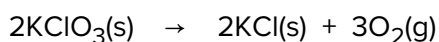
- 2 How many moles of  $\text{O}_2$  react with 0.01 mol  $\text{C}_3\text{H}_8$ ?



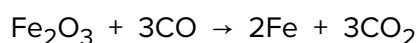
- 3 How many moles of  $\text{H}_2\text{S}$  are formed when 0.02mol of  $\text{HCl}$  react with excess  $\text{Sb}_2\text{S}_3$ ?



- 4 How many moles of oxygen are formed when 0.6mol of  $\text{KClO}_3$  react?

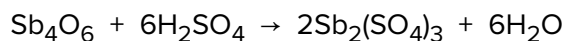


- 5 How many moles of iron are formed when 0.9mol  $\text{CO}$  react with excess iron oxide?

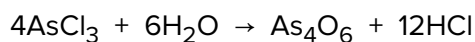


6 a. What is the limiting reactant in each of the following reactions?

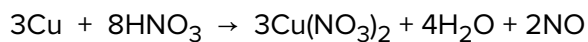
0.1 mol  $\text{Sb}_4\text{O}_6$  reacts with 0.5 mol  $\text{H}_2\text{SO}_4$



b. 0.20 mol  $\text{AsCl}_3$  reacts with 0.25 mol  $\text{H}_2\text{O}$



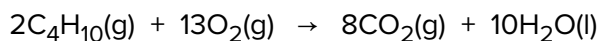
c. 0.25mol Cu react with 0.50mol dilute  $\text{HNO}_3$  according to the equation:



d. 0.10mol NaCl reacts with 0.15mol  $\text{MnO}_2$  and 0.20mol  $\text{H}_2\text{SO}_4$

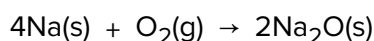


- 7 Consider the combustion of butane:



10.00g of butane reacts exactly with 35.78g of oxygen to produce 30.28g of carbon dioxide. What mass of water was produced?

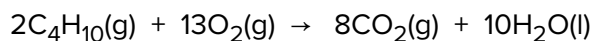
- 8 Consider the reaction of sodium with oxygen:



- a. How much sodium reacts exactly with 3.20 g of oxygen?

- b. What mass of  $\text{Na}_2\text{O}$  is produced?

- 9 The following equation represents the combustion of butane:

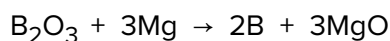


If 10.00 g of butane is used, calculate:

- a. the mass of oxygen required for the exact reaction

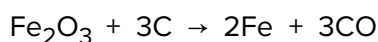
- b. the mass of carbon dioxide produced.

- 10 Boron can be prepared by reacting  $B_2O_3$  with magnesium at high temperatures:



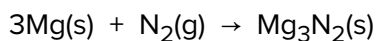
What mass of B is obtained if 0.75 g  $B_2O_3$  is reacted with 0.50 g Mg?

- 11 Iron(III) oxide reacts with carbon to produce iron:



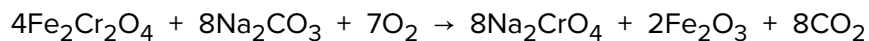
What mass of Fe is obtained if 10.0 tonnes of  $Fe_2O_3$  is reacted with 1.00 tonne of C?

- 12 Consider the reaction between magnesium and nitrogen:



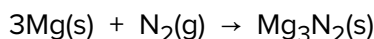
10.00g of magnesium is reacted with 5.00g of nitrogen. Which is the limiting reactant?

- 13 For the reaction:



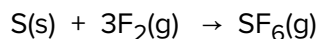
there is 100.0g of each reactant available. Which is the limiting reactant?

**14** Consider the reaction between magnesium and nitrogen:



10.00g of magnesium is reacted with 5.00g of nitrogen. Which is the limiting reactant?

**15** Consider the reaction between sulfur and fluorine:

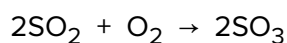


10.00g of sulfur reacts with 10.00g of fluorine.

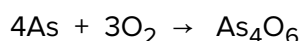
- Which is the limiting reactant?
- What mass of sulfur(VI) fluoride is formed?
- What mass of the reactant in excess is left at the end?

**16** Calculate the percentage yield in each of the following reactions.

- When 2.50 g of  $\text{SO}_2$  is heated with excess oxygen, 2.50 g of  $\text{SO}_3$  is obtained.



- When 10.0g of arsenic is heated in excess oxygen, 12.5 g of  $\text{As}_4\text{O}_6$  is produced.



- When 1.20 g ethene reacts with excess bromine, 5.23 g of 1,2-dibromoethane is produced.

