

Stoichiometry 1
Chemistry

Name

1 Calculate the number of grams in these quantities:

(a) 2.25 mol K

(b) 0.0600 mol Sn

(c) 0.725 mol O₂

(d) 1.333 mol H₂

2 Calculate the number of grams in these quantities:

(a) 2.55 mol NH₃

(b) 0.125 mol Al₂O₃

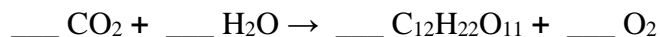
(c) 1.5 mol Fe(OH)₃

(d) 0.55 mol Mg (NO₃)₂

3 Liquid Br₂ has a density of $d = 3.119$ g/mL. Calculate the number of moles of bromine in 500.mL of liquid Br₂.

4 Which contains the greater number of molecules: 10.g H₂O or 10.g H₂O₂? Show evidence for your answer.

5 a) Balance the equation for the synthesis of sucrose from carbon dioxide and water:



b) Using the balanced equation, set up the mole ratios of:

(i) CO₂ to H₂O

(ii) C₁₂H₂₂O₁₁ to CO₂

(iii) H₂O to C₁₂H₂₂O₁₁

(iv) H₂O to O₂

(v) O₂ to CO₂

(vi) O₂ to C₁₂H₂₂O₁₁

6 Given the equation: $\text{CO}_2 + \text{H}_2 \rightarrow \text{CH}_4 + \text{H}_2\text{O}$

(a) How many moles of water can be produced from 25 moles of carbon dioxide?

(b) How many moles of CH_4 will be produced along with 12 moles of water?

7 Given the equation: $\text{MnO}_2(s) + \text{HCl}(aq) \rightarrow \text{Cl}_2(g) + \text{MnCl}_2(aq) + \text{H}_2\text{O}(l)$

(a) How many moles of HCl will react with 1.05 mol of MnO_2 ?

(b) How many moles of MnCl_2 will be produced when 1.25 mol of H_2O are formed?

8 Given the **balanced** equation: $\text{Al}_4\text{C}_3 + 12 \text{H}_2\text{O} \rightarrow 4 \text{Al}(\text{OH})_3 + 3 \text{CH}_4$

(a) How many moles of water are needed to react with 100. g of Al_4C_3 ? *Solve the mole-mole problem first.*

(b) How many moles of $\text{Al}(\text{OH})_3$ will be produced when 0.600 mol of CH_4 is formed?

9 Carbonates react with acids to form a salt, water, and carbon dioxide gas. As part of a science fair project, 0.80 mol of calcium carbonate are reacted with sufficient hydrochloric acid. How many moles of calcium chloride will be produced in this reaction? *Write a balanced equation first.*

10 Certain metals can displace hydrogen from acids to produce hydrogen gas and a salt. When 2.50 of aluminum metal are placed into hydrobromic acid HBr, how many **grams** of aluminum bromide will be produced? *Write the balanced equation first, and solve the mole-mole problem first.*