

Chemistry in Society

Worksheet 1

1) Which of the following compounds is a raw material in the chemical industry?

A Sodium chloride

B Ammonia

C Sulphuric acid

D Ethene

2) How many moles of zinc will react with 50cm3 of 2 mol l-1 hydrochloric acid?

Zn(s) + 2HCl(aq) ⭢ ZnCl2(aq) + H2(g)

A 0∙01

B 0∙02

C 0∙05

D 0∙10

n of HCl = v x c = 0.05 x 2 = 0.1

1:2 ratio

n of Zn = 0.05

3) How many moles are in 120.9g of Magnesium oxide (MgO)?

n = mass/FM = 120/40.31 = 3 moles

4) What mass of Calcium Carbonate (CaCO3) is 10.5 moles?

CaCO3 FM = 100.09

Mass = n x FM = 10.5 x 100.09 = 1050.945g

5) Avogadros constant is the same as the number of

a) atoms in 1 mole of Hydrogen

b) atoms in 40g of Calcium

c) atoms in 18g of Carbon

d) ions in 1 mole of potassium bromide

6) 3.2g of oxygen occupies 3360cm3

Calculate the molar volume of oxygen under these conditions

n = mass/FM = 3.2/32 = 0.1

MV = v/n = 3.36/0.1 = 33.6 l/mol

7) Calculate the volume occupied by 4.4g of carbon dioxide gas. (molar volume is 24 litres/mol)

n = mass/FM = 4.4/44 = 0.1

V = n x MV = 0.1 x 24 = 2.4 l

8) Calculate the number of moles in 88g of carbon dioxide

n = mass/FM = 88/44 = 2 moles

9) Calculate the number of molecules in 88g of carbon dioxide

2 x 6.02214129 × 1023 = 1.2 x 1024

10) Calculate the number of atoms in 88g of carbon dioxide

3 x 1.2 x 1023 = 3.612 x 1024