IGCSE Review Q

1 In the decomposition of $KClO_3$, 6.30 mol of oxygen was produced:

$$2KClO_3 \rightarrow 2KCl + 3O_2$$

How many moles of KCl would be produced?

A 4.20 B 6.30 C 12.6 D 18.9

2 What is the minimum number of grams of O_2 ($M_r = 32$) required to burn 1.6 grams of CH_4 (M_r=16) according to the equation below?

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

A 1.6 B 3.2 C 6.4 D 32

3 Aluminium reacts with hydrochloric acid to produce hydrogen gas according to the equation below:

$$2Al_{(s)} + 6HCl_{(aq)} \rightarrow 3H_{2(g)} + 2AlCl_{3(aq)}$$

Which expression gives the number of moles of hydrogen that can be produced from 0.24 moles of Al and excess hydrochloric acid?

A 0.24 x (3/2)
B 0.24 x (2/3)
C 0.24 x (3/6)
D 0.24 x (6/2)

4 The balanced equation for the reaction $BaCl_2$ with Na_3PO_4 is

$$3BaCl_{2(aq)} + 2Na_3PO_{4(aq)} \rightarrow Ba_3(PO_4)_{2(s)} + 6NaCl_{(aq)}$$

How many moles of NaCl could be produced from 2 moles of $BaCl_2$ and excess Na_3PO_4?

A 1 B 2 C 3 D 4

5 Aluminium chloride may be prepared as follows:

$$2Al_{(s)} + 3Cl_{2(g)} \rightarrow Al_2Cl_{6(s)}$$

Calculate the mass of aluminium required to produce 26.7 g of aluminium chloride. [3]

Moles Al_2Cl_6 = 0.1
Moles Al = 0.2
Mass Al = 5.4g

6 Potassium nitrate decomposes at 400°C according to the following equation:

$$2KNO_3 \rightarrow 2KNO_2 + O_2$$

Calculate the mass of oxygen produced, measured at room temperature and pressure, when 101 g of potassium nitrate are completely decomposed. [3]

Moles KNO_3 = 1
Moles O_2 = 0.5
Mass O_2 = 16g

7 The rate of the reaction between calcium carbonate (limestone) and hydrochloric acid may be followed by measuring the mass of carbon dioxide given off at certain times. The equation for the reaction is:

$$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$$

Calculate the mass of carbon dioxide that is obtained when excess hydrochloric acid is reacted with 20.00 g of limestone. [3]

Moles limestone = 0.2
Moles CO_2 = 0.2
Mass CO_2 = 8.8g

8 Calcium carbonate decomposes according to the equation:

$$CaCO_3 \rightarrow CaO + CO_2$$

Calculate the mass of calcium oxide obtained when 50.0 kg of calcium carbonate is decomposed. [3]

Moles $CaCO_3$ = 500
Moles CaO = 500
Mass CaO = 28Kg/28000g

9 Iron ore is converted into iron as shown in the equation below:

$$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$$

Calculate the mass of iron (III) oxide required to produce 7000 kg of iron. [3]

Moles Fe = 125000
Moles Fe_2O_3 = 62500
Mass Fe_2O_3 = 10000Kg

10 A process for the production of sodium hydroxide, chlorine and hydrogen from brine (sodium chloride solution) can be summarised by the equation:

$$2NaCl + 2H_2O \rightarrow 2NaOH + H_2 + Cl_2$$

Calculate the maximum mass of hydrogen that could be made from 117 g of sodium chloride. [3]

Moles NaCl = 2
Moles H_2 = 1
Mass H_2 = 2g