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| **Gram A 🡪 Gram B** | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Part I:**

Given the following equation for the combustion of hexane (C6H14):

C6H14 + O2 🡪 CO2 + H2O

1. What is the balanced equation?

2 C6H14 + 19 O2 🡪 12 CO2 + 14 H2O

1. What mass of CO2 is produced by burning 268 g of C6H14?

823 g CO2 are produced

1. What mass of oxygen is consumed when 3.00 kg of hexane reacts?

1.06 x 104 g O2 are consumed

1. If burning a quantity of hexane produces 78.0 grams of H2O, what mass of CO2 would be produced at the same time?

163 g CO2 are produced

1. Carbon dioxide is a greenhouse gas. What mass of carbon dioxide is produced by burning 20.0 moles of hexane?

5.28 x 103 g of CO2 are produced

The balanced equation for hexamine combustion is:

4 C6H15N + 43 O2 🡪 24 CO2 + 30 H2O + 4 NO2

1. Calculate the molar mass of each compound.

C6H15N: 101.0 g/mol

O2: 32.0 g/mol

CO2: 44.0 g/mol

H2O: 18.0 g/mol

NO2: 46.0 g/mol

1. What mass of oxygen is required to react with 76.3 g of C6H15N?

260. g O2 is required

1. Calculate the mass of water produced when 253 g of O2 are consumed.

99.3 g H2O is produced

1. What mass of C6H15N is required to produce 4.60 kg of CO2?

1760. g C6H15N is required

1. How many moles of O2 are consumed is 426 g of NO2 are produced?

100. mol O2

1. A reaction between potassium and chlorine produced 250.0 grams of the product. How many grams of potassium and chlorine were needed for the reaction?

2 K + Cl2 🡪 2 KCl

131 g K

59.5 g Cl2

1. Aluminum reacts with Fe3O4 to give Al2O3 and iron. If 40.2 g of iron are produced, find the masses of the other chemicals involved.

8 Al + 3 Fe3O4 🡪 9 Fe + 4 Al2O3

M.M. Fe3O4 = 231.4 g/mol

M.M. Al2O3 = 102.0 g/mol

17.3 g Al

55.6 g Fe3O4

32.7g Al2O3

1. Sulphur and oxygen react together to produce SO2. If 356 g of SO2 is produced, find the masses of the two reactants.

S8 + 8 O2 🡪 8 SO2

179 g S8

178g O2

1. When isopropanol (C3H8O) burns in oxygen, carbon dioxide and water are produced. Determine how many grams of carbon dioxide and water are produced when 5682 kg of isopropanol is burned.

2 C3H8O + 9 O2 🡪 6 CO2 + 8 H2O

M.M. C3H8O = 60.0 g/mol

12500 kg CO2

6818 kg H2O

1. Sodium metal reacts with iron (II) chloride. How many grams of both products are produced when 5.00g of sodium metal is reacted?

2 Na + FeCl2 🡪 Fe + 2 NaCl

6.06 g Fe

12.7 g NaCl

**Part II:**

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| **Answers:** 1) 0.78 g LiOH 2) 0.11 g NaCl | 3) 2.58 g CO2 | 4) 0.38 g Sb | 5) 1.45 g H2O2 | 6) 0.44 g CO |
| 7) 0.68 g NaNO3 8) 1.32 g Ca(OH)2 |  |  |  |  |