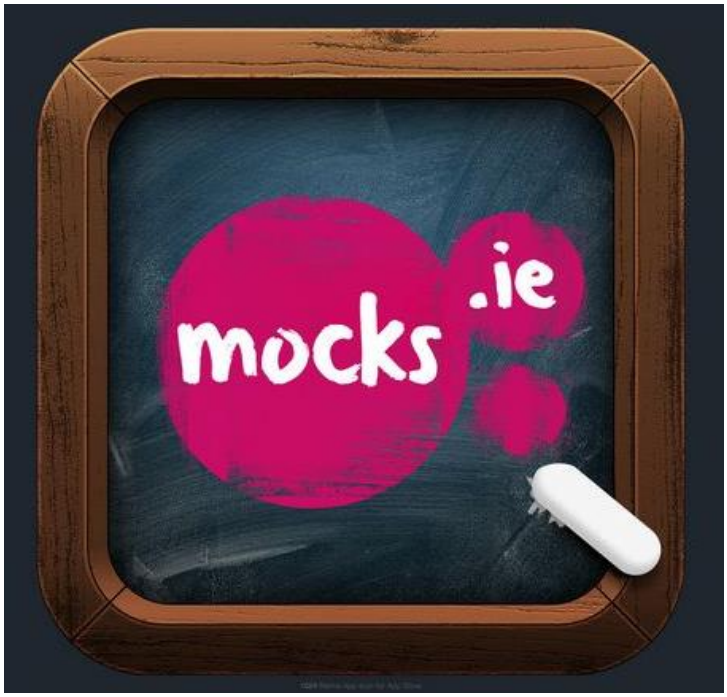

Stoichiometry, Formulae & Equations

Chemistry Past Exam Questions

Higher Level

2013

Section B - Question 4 F

(*f*) Complete and balance the equation for the chemical reaction that occurs when a piece of sodium is added to ethanol: $C_2H_5OH + Na \rightarrow$

2011

Section B - Question 4 F

(*f*) Complete and balance the equation for the chemical reaction that occurs when a piece of aluminium is placed in a solution of copper(II) ions: $Cu^{2+} + Al \rightarrow$

2010

Section B - Question 4 K

A Write a balanced equation for the reduction of iron(III) oxide by carbon monoxide in a blast furnace.

or

B Write a balanced equation for the reaction that occurs when sulfur dioxide from industrial gaseous emissions dissolves in water.

2008

Section B - Question 11 B

(*b*) From July 2008 changes will apply to the way in which taxes are levied on new cars bought in Ireland. Vehicles that, in controlled tests, have higher levels of carbon dioxide emission per kilometre travelled will be subject to higher levels of taxation. The measures are designed to encourage the purchase of cars that are more fuel-efficient and have lower CO_2 emissions.

The manufacturer's specification for a certain diesel-engined car is 143 g CO_2 / km (i.e. the car produces 143 g of CO_2 for every kilometre travelled). The car is used for morning and afternoon school runs totalling 8 km per day.

Use the manufacturer's CO_2 emission figure to calculate the amount of CO_2 produced each day during the school runs in terms of

(*i*) the mass of CO_2, (*ii*) the number of moles of CO_2,

(*iii*) the volume of CO_2 at room temperature and pressure. (18)

If a large SUV (sports utility vehicle) with a CO_2 emission rating of 264 g CO_2 / km were used instead of the car mentioned above, how many more litres of CO_2 would be released into the atmosphere per day during the school runs? (7)

2007

Section B - Question 11 B

(*b*) (*i*) State *Avogadro's law*. (7)

(*ii*) Carbon dioxide is stored under pressure in liquid form in a fire extinguisher. Two kilograms of carbon dioxide are released into the air as a gas on the discharge of the fire extinguisher. What volume does this gas occupy at a pressure of 1.01×10^5 Pa and a temperature of 290 K? (9)

What mass of helium gas would occupy the same volume at the same temperature and pressure? (6)

(*iii*) Give **one** reason why carbon dioxide is more easily liquefied than helium. (3)

2005

Section B - Question 11 B

(*a*) An indigestion tablet contains a mass of 0.30 g of magnesium hydroxide [$Mg(OH)_2$] as its only basic ingredient. The balanced chemical equation for the reaction between magnesium hydroxide and hydrochloric acid ($HCl_{(aq)}$), the acid produced in the stomach, is as follows:

$$Mg(OH)_2 + 2HCl \longrightarrow MgCl_2 + 2H_2O$$

(*i*) Calculate the volume of 1.0 M **HCl** neutralised by <u>two</u> of these indigestion tablets. Give your answer correct to the nearest cm^3. (8)

(*ii*) What mass of salt is formed in this neutralisation? (5)

(*iii*) How many magnesium ions are present in this amount of the salt? (6)

(*iv*) Another indigestion remedy consists of a suspension of magnesium hydroxide [$Mg(OH)_2$] in water and is marked 6% (w/v).
What volume of this second indigestion remedy would have the same neutralising effect on stomach acid as two of the indigestion tablets mentioned earlier? (6)