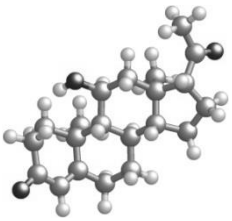


Chem!stry

Name: …… **( )**

Class: ……

Date: …… **/** …… **/** ……

Mole Calculations Assignment Two

1. Sodium reacts with water to form an aqueous solution of sodium hydroxide and hydrogen.

a) Write the balanced chemical equation, including state symbols, for this reaction:

……..

b) A student added 34.5 g of sodium to 250 cm^3 of distilled water.

i) Calculate the volume of hydrogen gas produced by this reaction.

ii) Calculate the concentration of sodium hydroxide produced by this reaction.

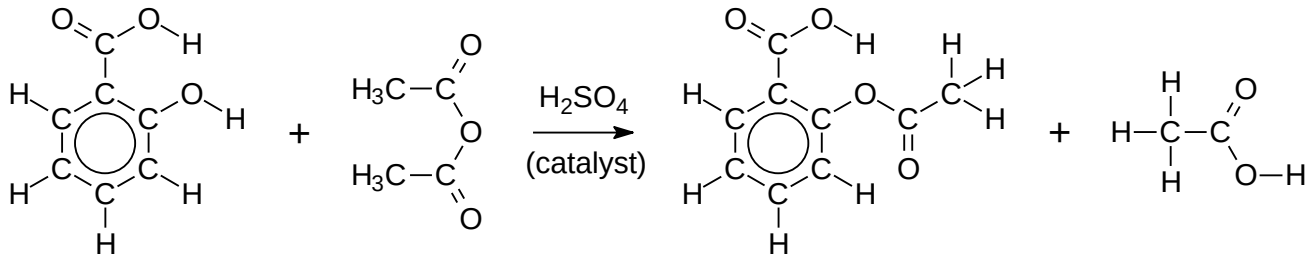
2. Ammonia burns in oxygen to produce nitrogen and water vapour.

a) Write the balanced chemical equation, including state symbols, for this reaction.

……..

b) Calculate the volume of water vapour that is produced when 42.5 g of ammonia burn completely in oxygen.

3. Aspirin can be made from 2-hydroxybenzoic acid according to the following chemical equation:



2-Hydroxybenzoic Acid + Ethanoic Anhydride → 2-Ethanoylhydroxybenzoic Acid (Aspirin) + Ethanoic Acid

a) What mass of aspirin can be made from 759 g of 2-hydroxybenzoic acid?

b) The reaction only produced 960.3 g of aspirin. Calculate the percentage yield.

4. A rock sample contains a mixture of magnesium carbonate and sand. 90.0 g of the rock sample was found to react exactly with 135 cm^3 of 8.00 mol/dm^3 hydrochloric acid.

a) Write the balanced chemical equation, including state symbols, for the reaction between magnesium carbonate and hydrochloric acid.

……...

b) Using the information given, calculate what percentage of the rock sample is magnesium carbonate.

5. An aqueous solution of an unknown metal nitrate, **M**NO_3, was reacted with an excess of aqueous sodium hydroxide. A white precipitate of the metal hydroxide, **M**OH, was formed. The balanced chemical equation for the reaction is given below:

$$\mathbf{M}NO_3(aq) + NaOH(aq) \rightarrow \mathbf{M}OH(s) + NaNO_3(aq)$$

40.0 cm^3 of 5.00 mol/dm^3 aqueous sodium hydroxide were found to precipitate 25.0 g of the metal hydroxide. Use this information to calculate the relative molecular mass of metal **M**, and hence identify the metal.

6. Acids react with alkalis to form a salt and water.

a) Write the balanced chemical equation for the reaction between sulfuric acid and aqueous sodium hydroxide.

……...

b) 150 cm^3 of 0.200 mol/dm^3 aqueous sodium hydroxide were reacted with 50.0 cm^3 of 0.400 mol/dm^3 sulfuric acid. What is the limiting reagent for this reaction?

- Scan the QR code below for the answers to this assignment.

http://www.chemist.sg/mole/assignments/mole_two_ans.pdf