Quantitative Chemistry

Identify how many atoms are in each compound / molecule and calculate the Mr.

Formula	No. of Atoms	Mr
CO_2		
O_2		
MgO		
$CaCl_2$		
$CuSO_4$		
$Mg(NO_3)_2$		

For the following. Balance the equation (if necessary) and then calculate how much mass is being produced.

9.6g of magnesium is added to copper sulphate solution. What mass of copper is made?

$Mg + CuSO_4 \longrightarrow Cu + MgSO_4$

9.2g of sodium burns in oxygen. What mass of sodium oxide is made?

$Na + O_2 \longrightarrow Na_2O$

What mass of aluminium needs to be added to iron(III)oxide to make 1.4g of iron?

$Al + Fe_2O_3 \longrightarrow Fe + Al_2O_3$

Describe what the mole is.

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In the space below write down the equation triangle that links moles, mass and Mr. Include any units.

Use the concentration formula to calculate the following:

Calculate the number of moles of Hydrochloric acid that must be dissolved to make the following solutions

(i) $500cm^3$ of 1 mol/dm^3

(ii) $250cm^3$ of 2 mol/dm^3

Calculate the concentration of each of the following solutions of Copper Sulphate

(i)   2 mol of HCl dissolved to make 1 litre (dm^3) of solution

(ii)   0.5 mol of HCl dissolved to make $250cm^3$ of solution

Calculate the volume of each of the following solutions of sodium hydroxide

(i)   1 mol/dm^3 solution containing 2 mol of solute

(ii)   0.1 mol/dm^3 solution containing 0.5 mol of solute

In the space below write down the equation triangle that links moles, concentration and volume. Include any units.

Use both equation triangles to solve the following:

Calculate the number of grams of substance needed to make each of the following solutions.

$100cm^3$ of KOH (aq), concentration 0.5 mol/ dm^3

$25cm^3$ of lithium nitrate solution, concentration 0.2 mol/dm^3

What is the equation used to calculate percentage yield?

Calculate the percentage yield of the following reactions:-

a) Maximum amount of product = 250g, actual amount of product = 133g

b) Maximum amount of product = 148g, actual amount of product = 68g

c) Maximum amount of product = 1609g, actual amount of product = 1460g

Quantitative Chemistry

What is the equation used to calculate atom economy?

Calculate the atom economy of making C_2H_5Cl in the following reactions:-

a) $C_2H_4 + HCl \rightarrow C_2H_5Cl$

b) $C_2H_5OH + HCl \rightarrow C_2H_5Cl + H_2O$

What is the equation used to calculate the number of moles of a gas using its volume in dm^3?

Describe how you would carry out a titration reaction. Include the names of equipment and give on example of an indicator you could use PLUS the colour change seen

Calculate the number of moles of the following gases:-

a) $36dm^3$ of carbon dioxide

b) $10000dm^3$ of hydrogen