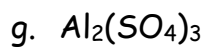
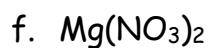


Relative Formula masses ( $M_r$ ) and Atomic Masses ( $A_r$ )

1. What is the  $M_r$  of the following



2. If a metal oxide has a  $M_r$  of 56 and a formula of  $XO$ ,  $X$  being the unknown metal. What is  $X$ ?

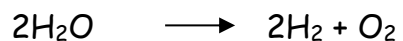
$X =$

3. If a metal chloride has a  $M_r$  of 80 and a formula of  $XCl_2$ ,  $X$  being the unknown metal. What is  $X$ ?

$X =$

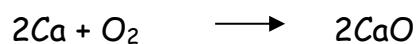
## Calculating Reacting Masses of Products and Reactants

1. When water is electrolysed it breaks down into hydrogen and oxygen:

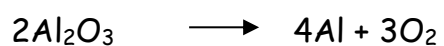


What mass of hydrogen is produced by the electrolysis of 6g of water?

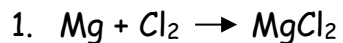
2. What mass of calcium oxide is produced when 10g of calcium burns?



3. What mass of aluminium is produced from 100g of aluminium oxide?



Maximum (Theoretical) Yield and percentage yield



a. What is the  $A_r$  of Mg?

b. What is the  $M_r$  of  $\text{MgCl}_2$ ?

c. If 24g of Mg reacted what would the maximum mass of  $\text{MgCl}_2$  be?

If we only got 90g what is the percentage yield?

d. If 48g of Mg reacted what would the maximum mass of  $\text{MgCl}_2$  be?

If we only got 120g what would the percentage yield be?



a. What is the  $M_r$  of  $\text{O}_2$ ?

b. What is the  $M_r$  of  $\text{H}_2\text{O}$ ?

c. If 32g of  $\text{O}_2$  reacted what would the maximum mass of  $\text{H}_2\text{O}$  be?

If we got 32g of water what is the percentage yield?

$\text{Percentage yield} = \frac{\text{actual yield}}{\text{predicted yield}} \times 100$
---

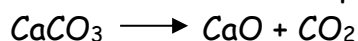
- d. If 12g of  $O_2$  reacted what would the maximum mass of  $H_2O$  be?  
If we got 10g of water what is the percentage yield?

3. Why do we want a high percentage yield for a reaction?

### Percentage Atom Economy

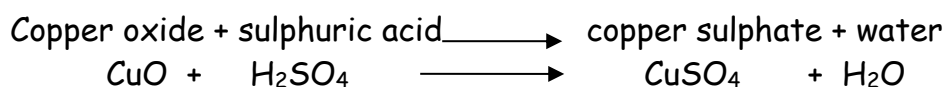
Percentage atom = economy	=	$\frac{\text{Mr of desired product}}{\text{total Mr of all products}}$	$\times 100$
------------------------------	---	--	--------------

1. Calcium oxide is made by the thermal decomposition of calcium carbonate  
This is shown in the equation below:



- What is the  $M_r$  of calcium carbonate ( $CaCO_3$ )?
- What is the  $M_r$  of calcium oxide ( $CaO$ )?
- What is the percentage atom economy in this reaction?

2. Copper sulphate can be made in the following reaction



Calculate the percentage atom economy of the reaction

3. Why do we want a high atom economy in a reaction?