S3 National 4 Chemistry

Unit 1 Elements & the Periodic Table

Lessons 10 & 11: Compounds and Formulae

Learning Outcomes

By the end of this lesson you should be able to :

1. Name compounds correctly using naming rules

2. Describe how chemical formula can be determined from names with prefixes, models or structures.

3. Write formula

Success criteria

You will have been successful in this lesson if you:

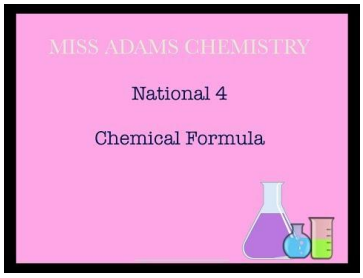
1. Read and learn the slides
2. Watch the videos provided
3. Copy the notes as instructed from the slides

If you have any questions about the content of this lesson, you should ask your class teacher either through your class MS team or via email. MS Teams will be monitored throughout the week by a chemistry teacher. If you need help or clarification with either the task or the content of the lesson, just ask.

What to do

Work through the power point slides in class materials. Copy the notes (or print and stick into your note book). Follow the instructions to complete diagrams or tables. Remember to watch the video links

Watch the ***first 6 minutes only*** of this video before you read the notes below:



Compounds and Formulae

A compound is a substance that is made up of two or more elements that are chemically joined together.
Since they are joined together, it is difficult to separate out the elements that make up the compound … energy must be supplied to do this, e.g. silver oxide can be broken up into silver and oxygen by heat energy, electrical energy can be used to break up copper chloride solution.
Compounds are formed when elements join together.

Definition
A compound is a substance that is made up of two or more elements that are chemically joined together

There are millions of different compounds in the world and they have a variety of uses – their properties depend on the type of bonding present in these compounds.

Naming Compounds:

The naming of a compound can be worked out using these rules.

1. Rule one:
The element that is **furthest left** in the periodic table **comes first**, e.g. Sodium Chloride/Carbon dioxide

2. Rule two:
If there are only two elements in the compound then the compound name ends in **-ide**, e.g. A compound of copper and sulfur is called copper sulfide.

3. Rule three:
If the compound contains three elements one of which is **oxygen** then the compound name will end in **-ate** or **-ite**, e.g. Calcium carbonate contains calcium, carbon and oxygen.
The exception to these rules is hydroxide – compounds with a "hydroxide" ending contain three elements, including hydrogen and oxygen.

In summary….the names of compounds tell us the elements which they contain:

-IDE contains the 2 elements obvious from the name
-ATE contains the 2 elements obvious from the name **plus oxygen**
-ITE contains the 2 elements obvious from the name **plus oxygen**

Click on the link below to access the powerpoint lesson on compounds and formulae

https://youtu.be/sFVPrm6CRO4

*Ignore the Starter Questions on Isotopes.

*Do Self Checks 14 & 15 (Not 1 & 2 as instructed in the video)

Copy and complete
(this is the same as on the power point - no need to do twice)

Compound	Elements present
iron sulfide	
Sodium chloride	
Magnesium nitride	
	Hydrogen, fluorine
	Lithium, oxygen
	Calcium, iodine
	Magnesium, hydrogen, oxygen
Zinc carbonate	
Copper sulfate	
Lead phosphate	
Aluminium sulfite	

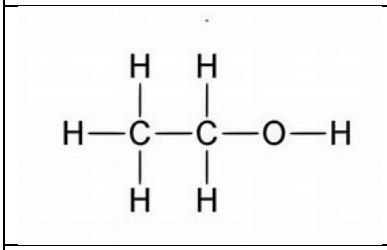
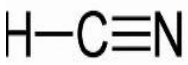
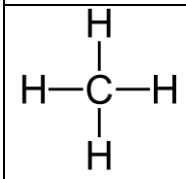
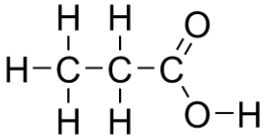
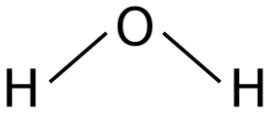
Chemical Formulae

The chemical formula of a molecule shows the number of atoms of each element in the molecule. For example, the formula for carbon hydride is CH_4.

This tells us that there are four hydrogen atoms bonded to one carbon atom. If a molecule contains only one of a certain atom there is no need to put a '1' in the formula. For example, the formula of hydrogen chloride is HCl and not H1Cl1.

Copy and complete:

(The first one has been done for you)

Structure	Name	Formula
	Ethanol	C_2H_5OH
	Hydrogen cyanide	
	Methane	
	Propanoic acid	
	Water	

Using prefixes

For compounds that contain **prefixes** we can use the prefix to tell us the **number** of atoms.

Prefix	*Number of atoms*
Mono-	one
Di-	two
Tri-	three
Tetra-	four
Penta-	five
Hexa-	six

Dinitrogen monoxide has the formula **N_2O**

Phosphorus pentachloride has the formula **PCl_5**

When you see one of the **prefixes** in a name it is simple to work out the formula

Example Uranium **hexa**fluoride

1 uranium 6 fluorine

Uranium hexafluoride has the formula: UF6

In your jotter, use the names of the following compounds to determine their formulae:

a) carbon **tetra**chloride

b) sulphur **tri**oxide

c) carbon **di**sulfide

d) aluminium **tri**chloride

e) lead **di**oxide

f) phosphorus **tri**bromide

Further work

Further work

To learn more about atomic structure, try the following online resources:

Evans2 chem web: https://www.evans2chemweb.co.uk/login/index.php#

Username: snhs password: giffnock

Select any teacher → revision material → Nat4 chemistry→ Unit 1: chemical changes and structure → formula

Homework

There will only be one homework over the next two weeks due to the half term February break:

Homework 9 Compounds.

It will be due by Friday 12th Feb and posted on Assignments in the S3Nat4 Chemistry Team.