

## N5: Formula

### *Naming compounds*

Compounds containing two elements end in \_\_\_\_\_

E.g. sodium + chlorine → \_\_\_\_\_

Compounds containing three elements, where one is oxygen end in \_\_\_\_\_ or \_\_\_\_\_

E.g. sodium + chlorine + oxygen → \_\_\_\_\_

Magnesium + nitrogen + oxygen → \_\_\_\_\_

Compounds containing \_\_\_\_\_ will also have three elements.

Compounds containing \_\_\_\_\_ will also contain a minimum of three elements.



What elements are contained in:

A) lithium oxide

B) Magnesium fluoride

C) Iron sulfide

D) Potassium sulfate

E) Copper carbonate

F) Calcium hydroxide

## Chemical formula

Chemical formula indicates the \_\_\_\_\_ present in a \_\_\_\_\_ using chemical symbols.

For covalent molecular substances the formula represents the \_\_\_\_\_ number of each element present.

For covalent network the formula represents the \_\_\_\_\_ of elements present.

For ionic substances the formula represents the \_\_\_\_\_ of \_\_\_\_\_ present.

E.g.  $\text{CO}_2$  contains \_\_\_\_\_ and \_\_\_\_\_

$\text{SiO}_2$  contains \_\_\_\_\_

$\text{MgCl}_2$  contains \_\_\_\_\_



What does each formula represent?

A)  $\text{NH}_3$

B)  $\text{Mg}(\text{NO}_3)_2$

C) C (diamond)

## Meaningful names

Some chemical names indicate how many of each element are present in a molecule using prefixes.

Prefix	Number	
Mono		E.g. carbon monoxide contains _____ and
Di		_____ and has
Tri		the formula _____
Tetra		NO <sub>2</sub> contains _____ and
Penta		_____ and is called
Hexa		_____



Write the formula for each compound:

A) carbon dioxide

B) silicon tetrachloride

C) dinitrogen tetroxide

Write the name of each compound:

A) NO

B) SO<sub>3</sub>

C) SO<sub>2</sub>

## Two element compounds

Most compound names do not indicate how many of each element are present. To be able to write formula for these it is important to be familiar with valency. Valency is \_\_\_\_\_

You can find the valency of an element using the group number:

Group	1	2	3	4	5	6	7	8
Valency								

For ions the valency is equal to the charge (for metals it is equal to the number of electrons in the outer shell, for non-metals it is equal to the number of electrons needed to fill the other shell).

There are two different ways to approach writing formulae:

- Valency pictures
- Cross over method

Magnesium chloride

Valency picture

Cross over method

Formula:

Calcium oxide

Valency picture

Cross over method

Formula:



Write the formula for:

A) lithium oxide

B) nitrogen hydride

C) hydrogen sulfide

D) aluminium oxide

### *Three element compounds*

For three element compounds the valency of group ions needs to be used. Group ion formula can be found on \_\_\_\_\_ of the data book. The \_\_\_\_\_ is equal to the valency.

The same methods for writing formula can be used but brackets must be used where there are multiple of the group ions.

Sodium sulfate

Valency picture

Cross over method

Formula:

Magnesium nitrate

Valency picture

Cross over method

Formula:



Write the formula for:

A) calcium carbonate

B) ammonium chloride

C) aluminium hydroxide

D) potassium sulfite

E) magnesium phosphate

## *Transition metal compounds*

The valency of transition metals changes in different compounds and cannot be identified from the periodic table. The valency is given as \_\_\_\_\_ after the transition metal in the name. If this is not given then assume the valency is \_\_\_\_\_.

Valency	1	2	3	4	5	6	7	8
Roman Numeral								

Copper (II) chloride

Valency picture

Cross over method

Formula:

Nickel (II) nitrate

Valency picture

Cross over method

Formula:



?

Write the formula for:

A) iron (III) oxide

B) vanadium (V) oxide

C) copper (I) nitrate

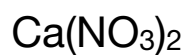
D) ruthenium (VI) sulfate

E) zinc (II) phosphate

## *Ionic formula*

Ionic formula is used to show the charges of the ions present in ionic substances.

Brackets need to be used where there are multiple of an ion.



Write the ionic formula for:

- A) LiF
- B) MgBr<sub>2</sub>
- C) KOH
- D) Na<sub>2</sub>SO<sub>4</sub>
- E) CuCO<sub>3</sub>
- F) (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub>