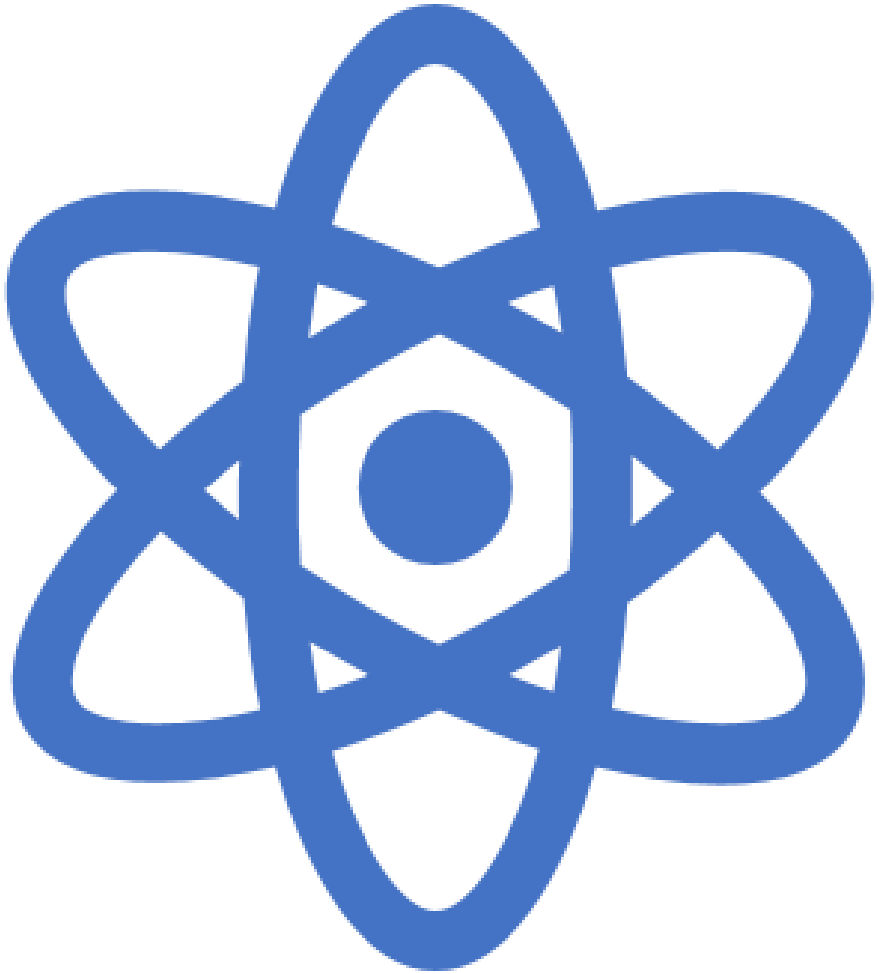
Ionic naming

By. Nimrit

What is a ionic compound?

- A ionic compound is made up of oppositely charged ions. It consists of regular arrangements of negatively charged ions and positively charged ions. It is held together by ionic bonds, which is the name for attraction between oppositely charged ions. They are hard and brittle and conduct electric when liquid or dissolved.
- Binary compounds= made up of two elements



How to name ionic compound

(name-formula)

Step 1

- First, thing you want do is find the metal and non-metal and it's symbol. Ionic compounds are always a metal and non-metal that’s how you identify it a ionic compound.

Let's try on together. (Calcium Phosphide)
Calcium= Ca Phosphide= P

Step 2

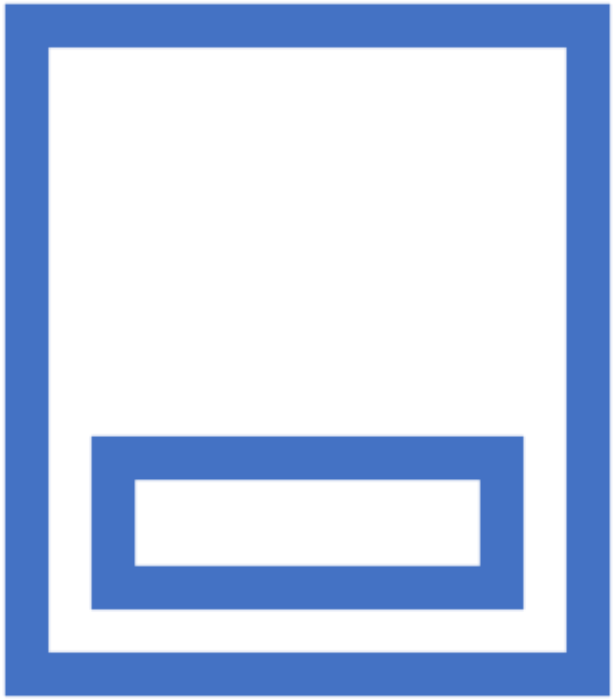
- Secondly, you want to find the charge you can do that by what column it is in. Then you want to see if the charges are balanced. If there not you can add more atoms till it's balanced, if it is already balanced you would keep it the same.

- Since the charges are not balanced we need to add atoms.

Ca^{+2} P^{-3}

Ca^{+2} P^{-3}

Ca^{+2} = 6- ANSWER= Ca_3P_2



Let's try another one (sodium fluoride)

Step 1-name the symbol sodium= Na Fluoride= F

Step 2- find charge Na^{+1} F^{-1}. It has the same charge so we would cancel out the charge.

ANSWER= NaF

Last one (Potassium oxide)

- Step 1-find symbol to both symbols Potassium= K Oxide= O
- Step 2- find charge for K^{+1} 0^{-2}
- Step 3- It is not balanced so we have to add more atoms.

K^{+1} O^{-2}

$\underline{K}^{+1}$

ANSWER=K_2O

YOUR TURN

ZINC NITIRIDE

=Zn_3N_2

TRY THIS

STRONIUM SULFIDE

=SrS

LAST ONE

HAFNIUM SELENIDE

=HfS_2

How to name ionic formula

Step 1 (SrO_2)

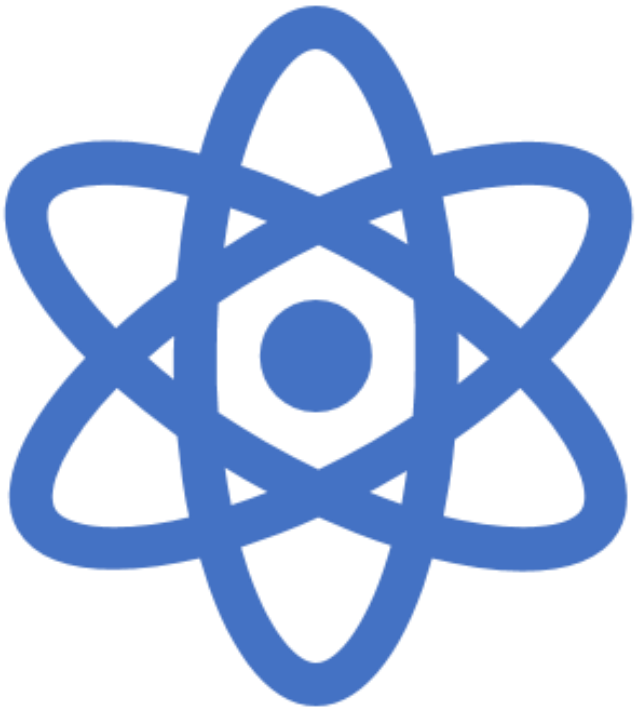
- The first element is always a metal and is always a positive. The first element will always stay.

Sr= Stronium

STEP 2

- The second element is always a non-metal so it will be a negative ion. The second element always ends in a ide

= Strontium Oxide



LET'S TRY ANOTHER ONE TOGETHER(KF)

Step 1- Keep first element same potassium

Step 2- we change the ending to ide= Fluoride

= Potassium Fluoride

Last one(AL^3S^2)

Step 1- Keep first element same= Aluminium

Step 2- we change the ending to ide= Sulfide

= Aluminium Sulfide

YOUR TURN

$MgCl_2$=

Magnesium cholride

YOUR TURN

Li3P=

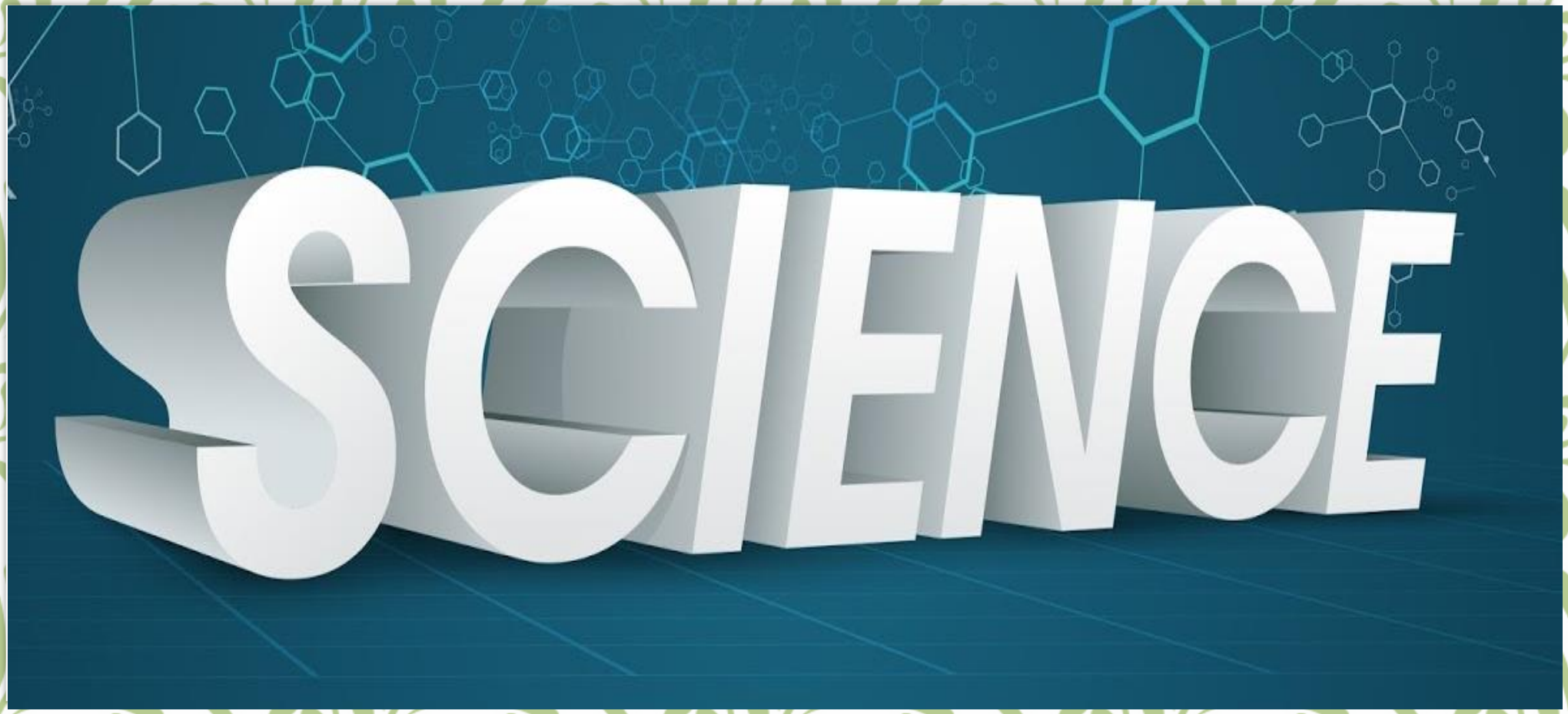
Lithium phosphide

YOUR TURN

N_4Cl_7=

Nitrogen chloride

Hope this helped you learn about ionic compounds!!


SCIENCE

How to Name Multivalent's (Name to formula)

There are multiple ions in multivalent naming

The first ion is the most common, but there is a roman numeral that tells you which ion you need to use

Example:

Niobium (Ⅲ) Oxide

Nb^{3+} O^{2-}

Niobium also has the ion 5+, but since the roman numeral said (Ⅲ), we had to use the 3+ ion

To turn this into a formula, You need to balance out the charges with a common denominator.

Niobium Oxide

Nb^{3+} O^{2-}

Nb^{3+} O^{2-}

O^{2-}

Nb^{6+} O^{6-}

Formula

Nb_2O_3

So for every 2 Niobium's you need 3 Oxygen's

Steps

To turn this:

Osmium (IV) Iodide

Into this:

OsI_4

Name to formula:

1) Change name to symbol

2) Take out the roman numeral

3) As a subscript, write the number of the element needed in order to balance the charges. When you only need 1 of the element, you don't add a subscript

How to Name Multivalent's (Formula to name)

Example:

$CrBr_2$

Cr = Chromium

Br = Bromine

Br^{1-} Br^{1-} = Br^{2-}

Since Bromine is 2- there needs to be a 2+ charge to balance this out. This means we need to use Chromium's 2+ charge.

Charge/ ion = Roman numeral

In this case the charge is 2+ so we use Ⅱ

Name:

Chromium (II) Bromide

The ending changes

ine → ide

Steps

To turn this:

AuP

Into this:

Gold (Ⅲ) Phosphide

Formula to name

1) Change the element symbol to it's name

2) Write down the 1st element

3) Add a roman numeral to represent the charge of the 1st element

4) Write down the 2nd element with the changed ending

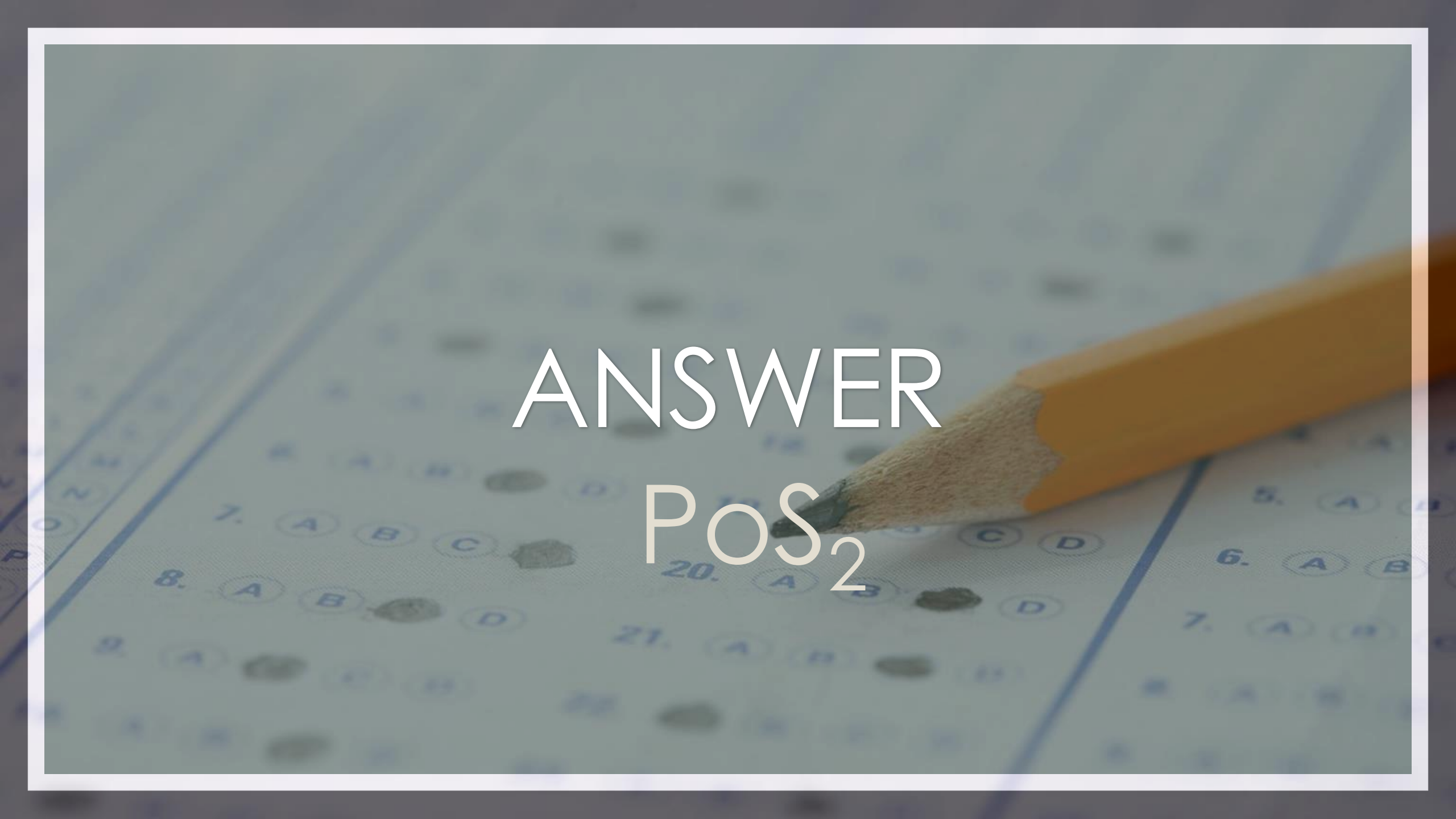
Name this Multivalent

Example:

Turn this into a formula

Polonium (Ⅳ) Sulfide

Name	Ion	Formula
Polonium Sulfide	**Po^{4+} S^{2-}**	???



ANSWER

PoS_2

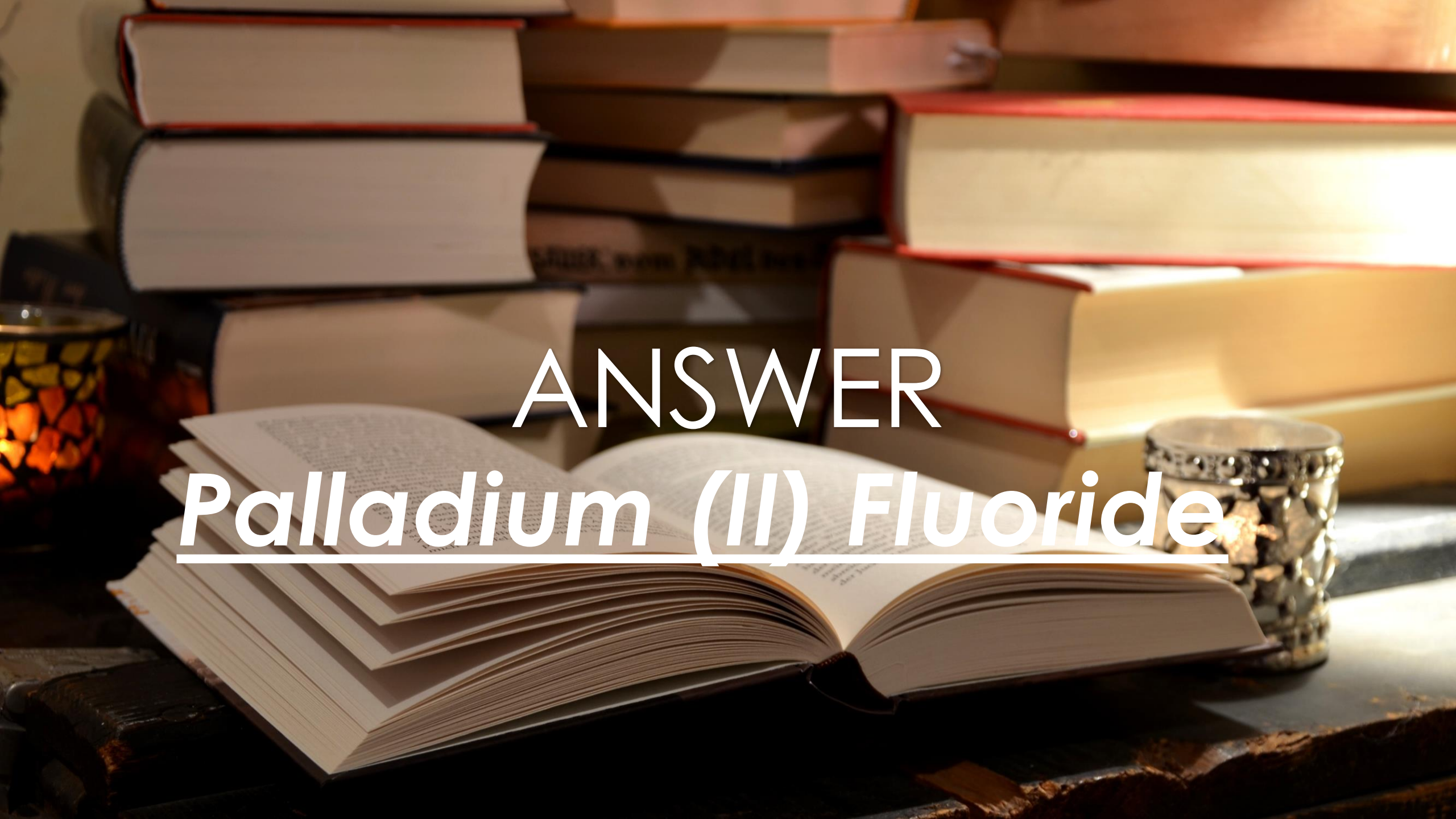
Name this Multivalent

Example:

Turn this into a name

PdF_2

Name	Ion	Formula
???	Pd^{2+} F^-	PdF_2



ANSWER

Palladium (II) Fluoride

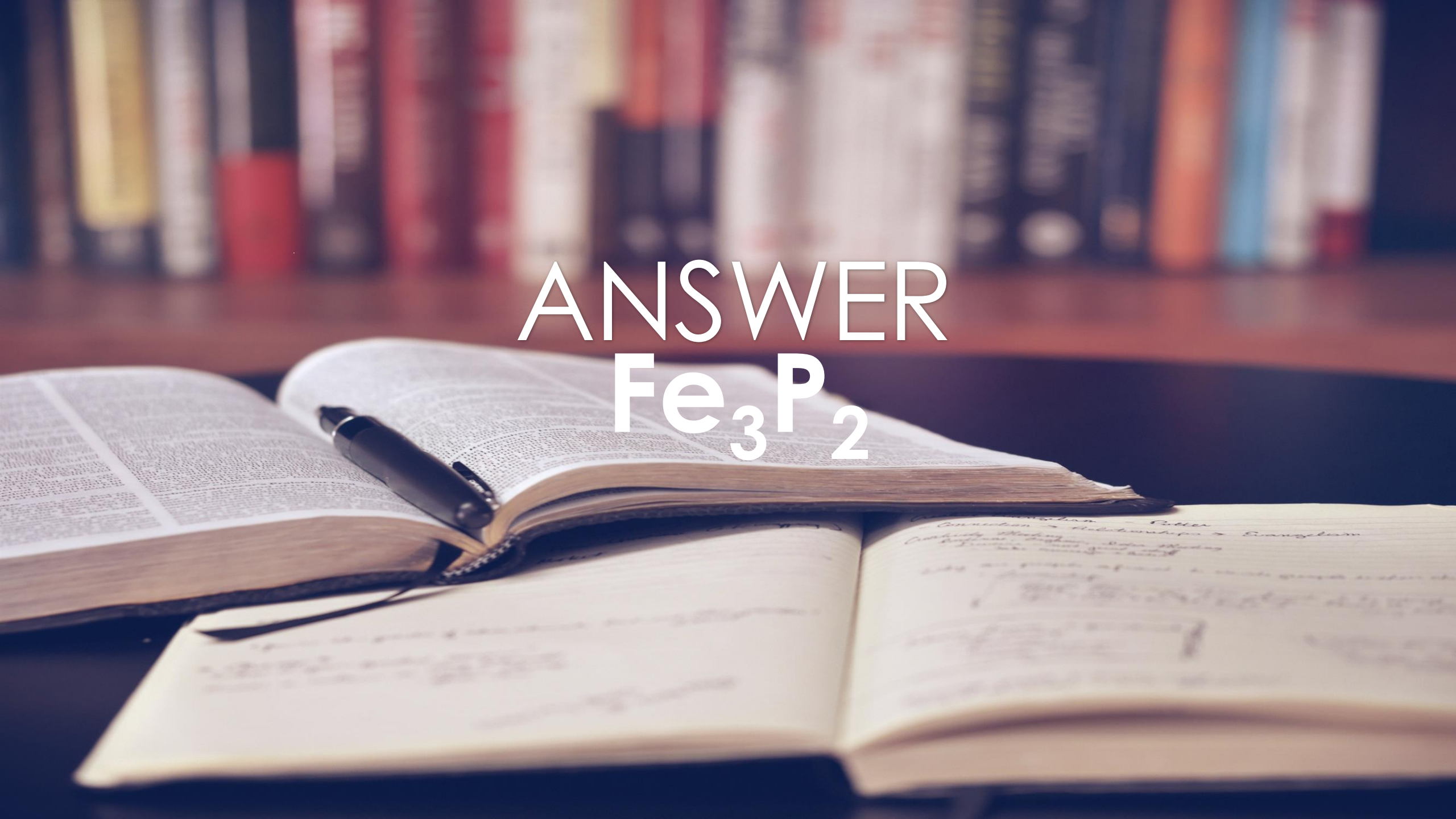
Name this Multivalent

Example:

Turn this into a formula

Iron (II) Phosphide

Name	Ion	Formula
Iron Phosphide	**Fe^{2+} P^{3-}**	???


ANSWER
Fe_3P_2

THANK YOU

By: Simrat

By Sejal Sohi

WHAT ARE POLYATOMIC IONS?

POLYATOMIC IONS

Note:
Keep in mind if there is two ion charges for one element, pick the number that is closer to 1.

A polyatomic ion is a group of atoms that have a charge

If you look at the periodic table, you'll see that some elements have numbers and positive and negative symbols, and some just have symbols. If elements don't have numbers with the plus and minus don't worry it just means they just one charge. This will appear on the top-right corner of each element.

For an example: Li^{+}, Mg^{2+}, Ca^{2+}, N^{3}, Te^{2+}, Cl^{-} etc…

This is called an Ion Charge.

POLYATOMIC IONS

Ion charges are important because, in order to find the chemical formula with polyatomic ions you'll have to make both charges equal.

In order to come up with the chemical formula for polyatomic ions there will be a set of elements that have different names and there not on the periodic table.

These are the most common polyatomic Ions. This is their name, symbol and charge.

Common Polyatomic Ions	
Nitrite	NO_2^-
Nitrate	NO_3^-
Sulfite	SO_3^{2-}
Sulfate	SO_4^{2-}
Phosphite	PO_3^{3-}
Phosphate	PO_4^{3-}
Carbonate	CO_3^{2-}
Hydroxide	OH^-
Hypochlorite	ClO^-
Chlorite	ClO_2^-
Chlorate	ClO_3^-
Perchlorate	ClO_4^-
Permanganate	MnO_4^-
Acetate	$C_2H_3O_2^-$
Hydrogen carbonate	HCO_3^-
Ammonium	NH_4^+
Iodate	IO_3^-

Polyatomic Ions are what happens when more than one atom comes together and they form a big group of atom, and the group of atom itself has a charge.

POLYATOMIC IONS

For an example Polyatomic Ions are things like NO_2^-, which stands for Nitrite, as you can tell from the chart of Polyatomic Ions

Ex.

NO_2^-

1.) If you look at the periodic table, it says "N" stands for Nitrogen and "O" stands for Oxygen.

This example shows us that there is 1 Nitrogen and 3 Oxygens.

We know this because after the O there is a small 3 next to the O, which means there must be 3 Oxygens. But after the N there is no number because it means there is only 1 of Nitrogen's.

The 1 Nitrogen and the 3 Oxygens are all connected to form a group has a charge of one, which is why there's a negative sign on top of the number 2.

This example has a charge of 1 because above the 2 there is a negative symbol that doesn't have a number next to it which means it's a negative 1.

POLYATOMIC IONS WITH BRACKETS

When writing a chemical formula, brackets are not always going to be needed, but when they are its important to add them or else its not going to make sense and so number will stay separate.

Its easy to tell when brackets are needed in order to complete the chemical formula. The chemical formula is the answer.

For an example, we can use Ca which is Calcium and Nitrite which is on the "Most common Polyatomic Ions" chart, and that stands for NO_3^-. Calcium's ion charge is 2+.

Ex.

Calcium	Nitrate
Ca_2^+	NO_3^-
	NO_3^-
2+	2-

Steps:

1. Write down the symbols
2. Now, to balance the charge we can add more charges to either one of these Polyatomic Ions.
3. Adding another charge to Nitrate will make more sense because then Calcium and Nitrate will both have 2 charges.
4. Now we have to write this into a chemical formula, because it shows how many of each charge it has altogether.

This is the complete chemical formula for Calcium and Nitrate.

$Ca(NO_3)_2$

I wrote Ca all by itself because we didn't have to add and extra charge to it like we did to Nitrate, because we want to make nitrate to be equal to the same amount as Calcium which is 2. To complete this chemical formula I had to add the brackets because I also had to add the number 2 left that I must add to the chemical formula, because altogether I added two Nitrates.

NAME TO FORMULA + FORMULA TO NAME

When writing chemical formulas for polyatomic ions, there are questions where you'll have to figure out the formula from the name.

For an example:

Magnesium	Phosphite
Mg^{+2}	PO_3^{3-}
Mg^{+2}	PO_3^{3-}
Mg^{+2}	
6+	6-

2+2 +2= 6+

3+3 =6-

$Mg_3(PO_3)_2$ ← Chemical Formula

Formula to name is just the opposite of name to formula, which means well have to find the name by looking at the formula.

For an example:

Ga^{3+} SO_4^{2-}

Now you'll look at your "most common polyatomic ions" chart and periodic table because only one of them are a polyatomic ion, which is SO_4^{2+}.

Ga3+	SO_4^{2+}
Gallium	Sulfate

← This is the answer to the formula to name question.

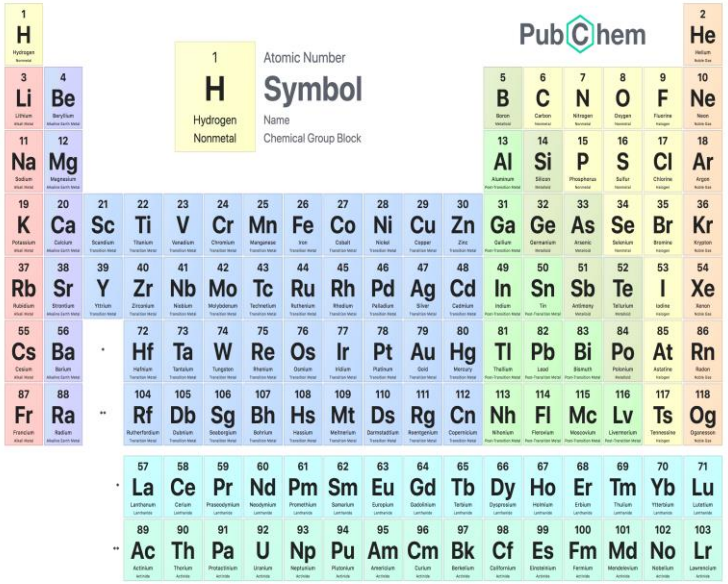
NOW LET'S SEE MORE EXAMPLES WITH STEPS

POLYATOMIC ION EXAMPLE 1

Level: Easy Name To Formula:

Lithium Cyanide

Li^+ CN^-



Common Polyatomic Ions	
Nitrite	NO_2^-
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Sulfite	SO_3^{2-}
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Phosphite	PO_3^{3-}
Phosphate	PO_4^{3-}
Carbonate	CO_3^{2-}
Hydroxide	OH^-
Hypochlorite	ClO^-
Chlorite	ClO_2^-
Chlorate	ClO_3^-
Perchlorate	ClO_4^-
Permanganate	MnO_4^-
Acetate	$C_2H_3O_2^-$
Hydrogen carbonate	HCO_3^-
Ammonium	NH_4^+
Iodate	IO_3^-

Steps:

1) Get a periodic table and a the "Most Common Polyatomic Ion" chart.
2) Look for Lithium's and Cyanide's symbol and charge.

POLYATOMIC ION EXAMPLE 2

Level: Medium Name To Formula:

Beryllium Nitrite

1) Be NO
2) Be(NO?)?
3) $Be(NO^2)$?
4) $Be(NO^2)_2$

$Be(NO^2)_2$

Note:
The 2 inside the bracket is at the top because it's the charge of the element, but the 2 outside of the bracket is at the bottom because it tells people if the element had to get double and if it did why.

Steps:

1) First write down both symbols.
2) Second add another Nitrite because there's only one charge in Nitrite, but another is needed for it to equal the same amount as Beryllium, which means brackets are needed.
3) Add a 2 inside the brackets because Nitrite has a charge of 2.
4) Add a 2 at the end (after the bracket) . We do that because that 2 tells people that there had do be another nitrite for the Ions to be equal.

NOW ITS YOUR TURN TO TRY AND FIGURE THE CORRECT ANSWERS.

FIRST POLYATOMIC EQUATION

Name To Formula

Sodium Sulfate

Na^{+1} SO_4^{-2}

Answer?

What are the steps?

Write the steps one-by-one

1) _____

2) _____

3) _____

4) _____

Etc… _____

SECOND POLYATOMIC EQUATION

Formula To Name

K_2CO_3

Potassium Carbonate

Answer?

What are the steps to find the name of the formula?

Write the steps one-by-one

1) _____

2) _____

3) _____

4) _____

Etc… _____

LAST POLYATOMIC EQUATION

What are the steps to find the formula for the name given.

Write the steps one-by-one

Formula To Name:

Calcium Hydrogen Sulfate

$Ca(HSO_4)_2$

Answer?

1) _____

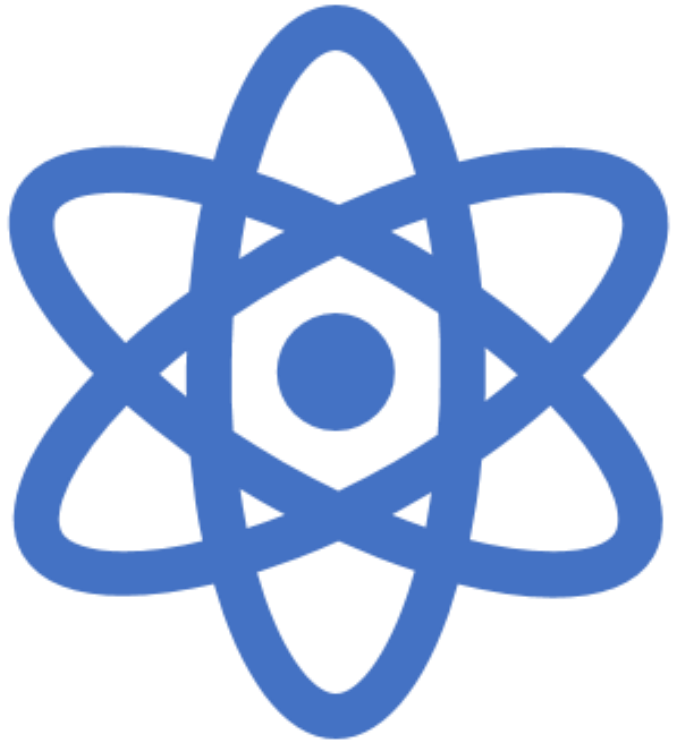
2) _____

3) _____

4) _____

Etc… _____

THE END



Naming Covalent Compounds

by Parnisha Grewal

Rules to name covalent compounds

- For the first element, start with its name
- For the second element, end its name with -ide
- Use pre-fixes to show how many atoms for each element are needed
  - Do not use mono- for the first element if there is only 1 atom
  - These are the 10 pre-fixes to use-

1: mono-	6: hexa-
2: di-	7: hepta-
3: tri-	8: octa-
4: tetra-	9: nona-
5: penta-	10: deca-

Formula to name

Example 1: ClF3

Step 1: the first element is Cl. Its chemical name is Chlorine. You do not put any pre-fixes because there is only 1 atom.

The first part to the answer is **Chlorine**.

Step 2: then I find the name for the F symbol which is Fluorine. But it must end with –ide so I change fluorine into **Fluoride**. But there is still more to it.

Step 3: there are three fluorides, so we use a pre-fix to put on the front of the element. For three, the pre-fix is tri-.

The second part to the answer will be **trifluoride**.

Answer: Chlorine trifluoride

Example 2: **XeF4**

Step 1: I first find out what Xe stands for which is Xenon. There is only 1 atom, so I do not add any pre-fixes.

The first part to the answer is **Xenon**.

Step 2: then I find out what F stands for which is Fluorine. But since the second element must end with –ide, I change Fluorine to **Fluoride**. There is still more to it.

Step 3:there are four fluorides, so we use a pre-fix to put on the front of the element. For the number four, the pre-fix is tetra-.

So the second part to the answer is **tetrafluoride**.

Answer: Xenon tetrafluoride

Example 3: ICl

Step 1: I first find out what **I** stands for which is **Iodine**. Since there is only one atom, I do not add any pre-fixes to the front of the word.

The first part to the answer is **Iodine.**

Step 2: then I find out what **Cl** stands for which is Chlorine. But since the second element is supposed to end with –ide, I change Chlorine to **Chloride**. There is still more to it,

Step 3: there is one chloride, so we use a pre-fix to put on the front of the element. For number one, the pre-fix is mono-.

The second part to the answer is **monochloride.**

Answer: Iodine monochloride

Now it is your turn to solve the following questions!!!

S_2F_{10}

Answer: Disulfur decafluoride

SF_6

Answer:Sulfur hexafluoride

BrF_3

Answer: Bromine trifluoride

Name to formula

How to write formulas

- You first figure out what the symbol is for the element.
- If there is a pre-fix at the beginning of the first word, then that is your number of atoms. So you would write the number after the symbol for the first element. If there is no pre-fix at the beginning of the word, then that means there is only one atom. In the formula if there is only one atom then you do not put any numbers after the symbol.
- You do the same for the second element name. First find the symbol for the name. Then depending on the pre-fix, you write the number after the symbol. If there is only one atom you do not put any numbers.

Example 1: **Dichlorine monoxide**

Step 1: I first figure out the symbol for chlorine which is **Cl.** I then find out how many atoms there are. Chlorine has di- in front of it which is 2 meaning there are 2 chlorine atoms.

The answer to the first part is **Cl_2.**

Step 2: I then figure out the symbol for the second element which is **O** for oxide. For oxide it has mono- in front of it which means there is 1 atom for oxide. But when I write the symbol, I do not put any numbers after it to represent 1.

The answer to the second part is **O.**

The final answer is Cl_2O

Example 2: disulfur decafluoride

Step 1: I figure out the symbol for sulfur which is **S**. I then figure out the number of atoms for the symbol. Since sulfur has di- in front of it, I know that is 2. So I put that after the symbol.

The answer to the first part is $\mathbf{S_2}$.

Step 2:then I figure out the symbol for fluoride which is **F**. Then I find the number of atoms needed for that symbol. Since fluoride has deca- in front of it, that means there are 10 atoms. So we put 10 after the symbol.

The answer to the second part is $\mathbf{F_{10}}$.

The final answer is S_2F_{10}.

Dinitrogen pentoxide

Answer: N_2O_5

Example 3: Selenium hexafluoride

Step 1: I first figure out what the symbol for selenium, which is **Se.** Since there is only one atom, I do not need to put 1 after Se, so I just leave it like that.

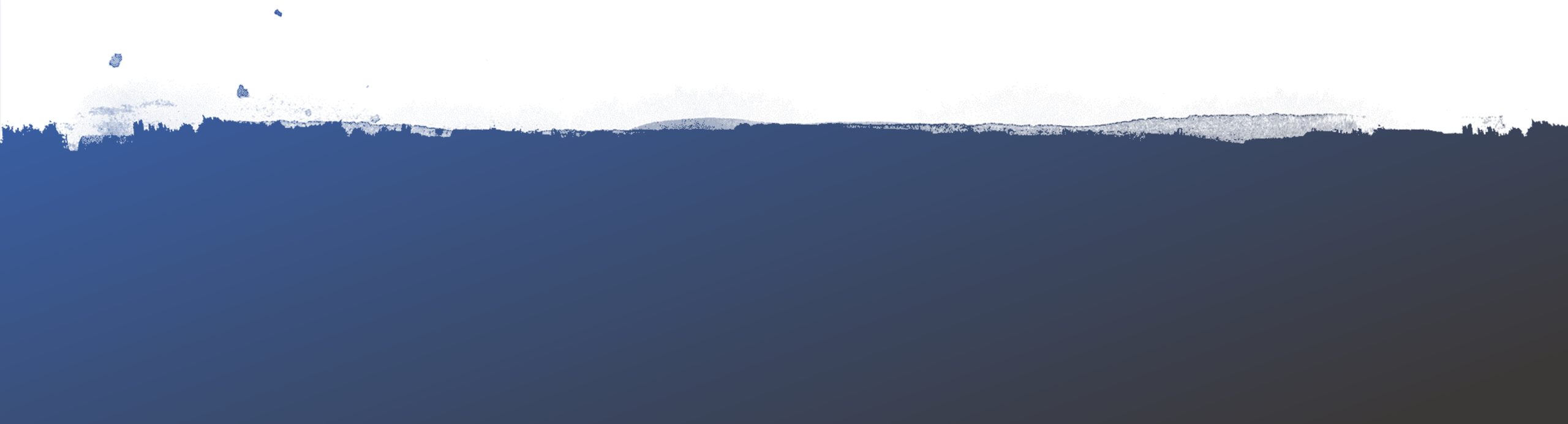
The answer for the first part is **Se.**

Step 2: now I figure out the symbol for fluoride which is **F.** now I see that there is hexa- in front of the element which is a pre-fix. Hexa- means 6 so then I put six after the symbol.

The answer for the second part is $\mathbf{F_6}$.


The final answer is
SeF_6.

Now it is your turn!!!

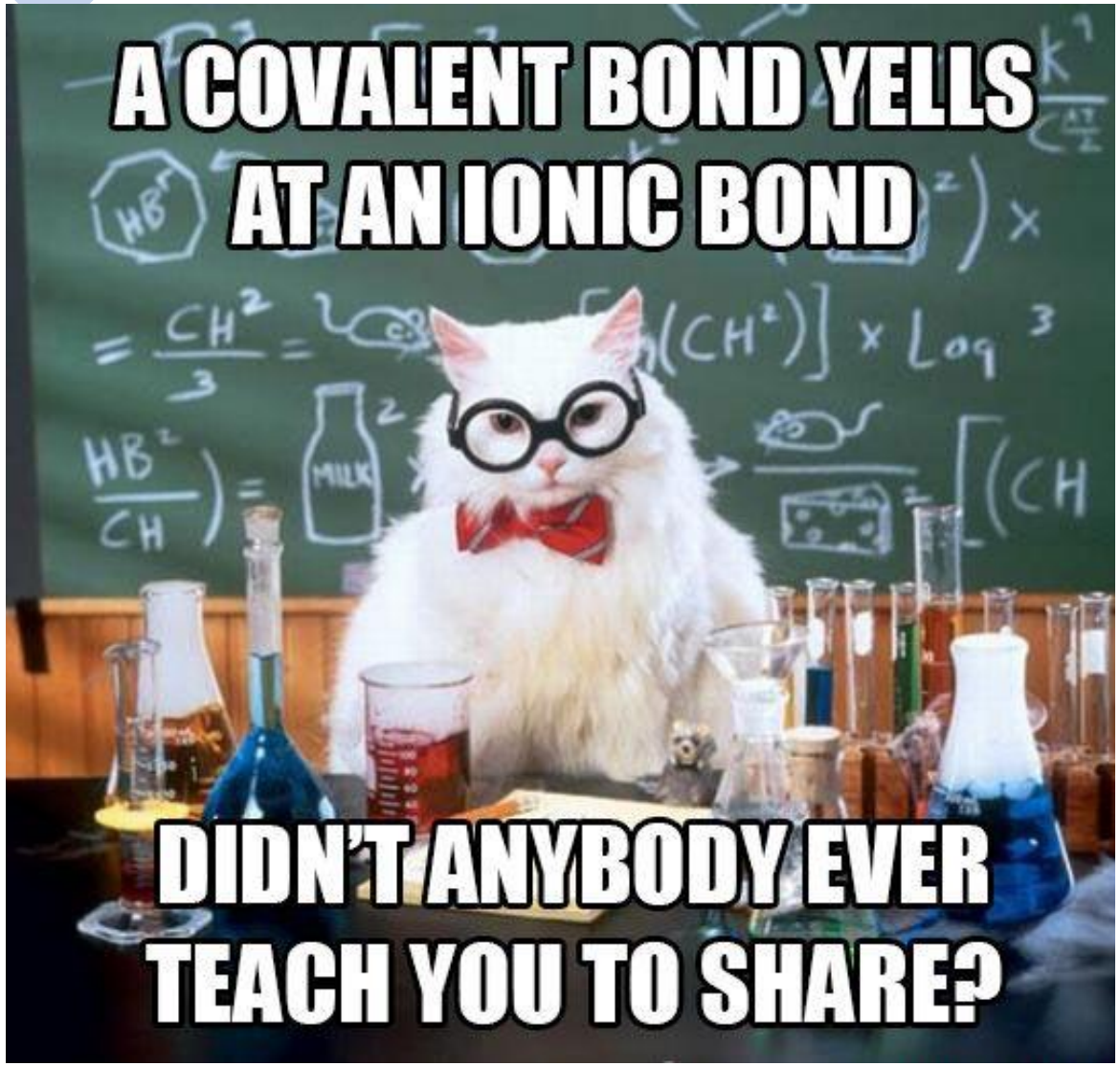


Silicon tetrachloride

Answer: $SiCl_4$

Tetraphosphorus decoxide

Answer: P_4O_{10}



Hope you learned something from my presentation.