**Naming Ionic Compounds**

***(This page should be photocopied on paper of one colour and page 2 on paper of a different colour)***

The chemical formula of the compound formed between sodium and fluorine is NaF because there is one sodium atom for each fluorine atom. Its name is sodium fluoride. Note that

* the metal atom is always written first
* the suffix or ending of the non-metal is changed. The three possible endings are - ide meaning no oxygen present i.e. fluoride

- ate meaning oxygen is present

- ite also means oxygen is present (usually one less oxygen atom than the –ate)

Copper sulfide is CuS

Copper sulfite is CuSO**3**

Copper sulfate is CuSO**4**

1. Name the following compounds

(a) MgSO**4** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (b) LiCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (c) Na**2**CO**3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(d) AgBr \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (e) Al**2**(SO**4**)**3** \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (f) Cu(NO**3**)**2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

2. Sketch the electrons around a magnesium atom, then an oxygen atom.

(a) How can electrons be transferred between these two atoms to form a compound with complete outer shells?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(b) What charges will each of the ions formed have? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(c) Give the name and formula of this compound. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Repeat the procedure for question 2 using magnesium and fluorine. You will need some lateral thinking to come up with the correct solution this time.

Carefully cut out the ions below. The relative width of the column reflects the charge on the ion.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Al+++** | **Mg++** | **Ca++** | **Na+** | **Li+** | **K+** |
| **Al+++** | **Mg++** | **Ca++** | **Na+** | **Li+** | **K+** |
| **Al+++** | **Mg++** | **Ca++** | **Na+** | **Li+** | **K+** |
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| **Al+++** | **Mg++** | **Ca++** | **Na+** | **Li+** | **K+** |
| **Al+++** | **Mg++** | **Ca++** | **Na+** | **Li+** | **K+** |
|  |  |  |  |  |  |

This page should be a different colour to the previous one.

Carefully cut out the ions below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
| **PO4 ---** | **SO4--** | **S--** | **F-** | **Cl-** | **Br-** |
|  |  |  |  |  |  |

Pick a positive ion and match it with a particular negative ion until you have balanced charges i.e. Aluminium and fluorine are not matched 1:1

Al+++

Al+++

Al ++++Al

F-

F-

F-

F-

***This compound has 1 Al3+ and 3 F- ions so is AlF3***

The correct formula for aluminium fluoride is AlF3 . Make as many correct compounds as you can, name them and write add them to the blackboard for the rest of the class to check.

4. Use the boxes above to give correct formulas for the following compounds

(a) Sodium sulfide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (b) Aluminium carbonate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(c) Calcium sulfate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (d) Aluminium phosphate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(e) Calcium sulfide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (f) Calcium bromide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_