**Ionic compound formulation**

The list below gives the essential list of ions that are necessary for Year 10 formulation. To formulate ionic compounds, all you need to do is combine the number of positive and negative ions so that the overall charge is equal to 0:

Lithium oxide 🡪 **Li*+*Li*+* O*2-***🡪 ***+1*** + ***+1***  +  ***-2***  = ***0***

**Beginnner**

**Positive ions**

Group 1 – All 1+ 🡪 Li+ Na+ K+ Rb+  Cs+

Group 2 – All 2+ 🡪 Be2+ Mg2+ Ca2+ Sr2+ Ba2+

Group 13 – All 3+ 🡪 Al3+ Ga3+

**Negative ions**

C4- (carbide) N3-/P3- (nitride/ phosphide) O2-/ S2- (oxide/ sulfide)

F-/Cl-/Br-/I- (fluoride/chloride/bromide/iodide)

**Practice**

*Lithium bromide, aluminium oxide, strontium nitride, BeF2, Cs2S, Ba3P2*

**Intermediate**

**Positive ions**

Group 3-12 – All can form more than 1 ion except

Sc3+, Ag+, Zn2+, Cd2+ so learn only these ions.

**Negative ions**

OH- (hydroxide) BO33- (borate) CO32- (carbonate) AsO43- (arsenate)

SiO44- (silicate) SO42-/SO32- (sulfate/sulfite) NO3-/NO2- (nitrate/nitrite)

PO43-/PO33- (phosphate/phosphite)

**Practice**

*Iron(III) nitrite, silver carbonate, cobalt(II) phosphate, Zn(OH)2, Cu4SiO4, ScBO3*

**Advanced**

**Positive ions**

These metals are located away from the other metals that you need to know: Sn2+, Sn4+, Pb2+, Pb4+.

**Negative ions**

O22- (peroxide)

ClO-/ClO2-/ClO3-/ClO4- (hypochlorite/chlorite/chlorate/perchlorate)

BrO-/BrO2-/BrO3-/BrO4- (hypobromite/bromite/bromate/perbromate)

IO-/IO2-/IO3-/IO4- (hypoiodite/iodite/iodate/periodate)

**Practice**

*Tin(II) perbromate, Lead(IV) peroxide, Tin(IV) hypoiodite, Pb(BrO2)2, SnO2, Pb(ClO3)4*

**Hero**

**Positive ions**

NH4+ (ammonium) - This is a slightly strange one as it is the only positive ion made of non-metals!

**Negative ions**

CN- (cyanide) SCN- (thiocyanate) OCN- (cyanate)

CrO42-/Cr2O72- (chromate/dichromate) MnO42-/MnO4- (manganate/permanganate)

**Practice:**

*Ammonium dichromate, Silver thiocyanate , Lead(IV) permanagante, NH4OCN, Cu2CrO4*

**CONGRATULATIONS!!! You are nearly an ionic compound formulation hero…**

Now you need to learn about oxidations states, formulate covalent compounds and acids…