GCSE Chemistry Formulae Sheet

1. Elements

Most elements' formulae are the same as the symbol. There are others that are diatomic (two atoms joined together) and some have 4 or 8 atoms joined together.

Name	Formula	Name	Formula
hydrogen	H_2	chlorine	Cl_2
nitrogen	N_2	bromine	Br_2
oxygen	O_2	sulfur	S_8
fluorine	F_2	phosphorus	P_4

2. Molecules

There are some formulae that you are expected to remember:

Name	Formula	Name	Formula
ammonia	NH_3	sulfuric acid	H_2SO_4
carbon monoxide	CO	nitric acid	HNO_3
carbon dioxide	CO_2	hydrochloric acid	HCl
sulfur dioxide	SO_2	methane	CH_4
ethanol	C_2H_5OH	water	H_2O

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3. Ions

You can use the periodic table to work out most of the formulae for ions:

Ion	Formula	Ion	Formula
Group 1: +1 charge e.g. lithium, sodium, potassium	Li^+, Na^+, K^+	**Group 5 (15): -3 charge** e.g. nitride	N^{3-}
Group 2: +2 charge e.g. barium, calcium	Ba^{2+}, Ca^{2+}	**Group 6 (16): -2 charge** e.g. oxide	O^{2-}
Group 3: +3 charge e.g. aluminium	Al^{3+}	**Group 7 (17): -1 charge** e.g. chlor**ide**, brom**ide**, iod**ide**	Cl^-, Br^-, I^-

Transition metals produce ions that usually have a charge of +2, silver and iron(III) are common exceptions. Compound ions contain more than one element and need to be learnt.

Ion	Formula	Ion	Formula
hydrogen	H^+	hydroxide	OH^-
silver	Ag^+	nitrate	NO_3^-
iron(II)	Fe^{2+}	carbonate	CO_3^{2-}
iron(III)	Fe^{3+}	sulfate	SO_4^{2-}
ammonium	NH_4^+		

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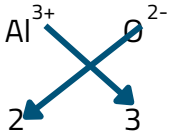
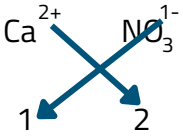
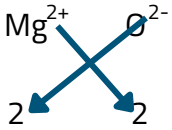
5. Ionic Compounds

These can be worked out by using the formulae of the ions and cancelling out the charges. When learning how to do this the cross over method can be useful. Two examples are given below:

	Method step	aluminium oxide	calcium nitrate
1.	Write down formulae of ions.	Al^{3+} O^{2-}	Ca^{2+} NO_3^-
2.	Draw arrows crossing over and copy the number of the charge underneath.		
3.	Write out formula by writing ion formula (without charge) and then the number underneath as a subscript. Will need to use brackets if need more than one of a compound ion.	Al_2O_3	$Ca(NO_3)_2$

Note: if the numbers are the same then you only need one of each ion to cancel out the charge.

e.g. magnesium oxide 

so is MgO not Mg_2O_2

Try these:

potassium chloride	sodium bromide	calcium iodide	barium oxide
silver nitrate	copper(II) carbonate	iron(III) sulfate	ammonium hydroxide

Answers