Summary sheet: Writing formulae

Writing formulae

Compounds should have no overall charges, so the positive and negative charges should cancel each other out.

Apart from working out the charges on ions made up of one element, you need to know the following compound ions and their charges.

|  |  |  |
| --- | --- | --- |
| Name | Formula | Charge |
| hydroxide | OH– | 1– |
| nitrate | NO3– | 1– |
| sulfate | SO42– | 2– |
| carbonate | CO32– | 2– |
| ammonium | NH4+ | 1+ |

Follow these steps.

|  |  |  |
| --- | --- | --- |
| Write the name of the compound | Magnesium bromide | Sodium sulfate |
| Work out the charge of your positive ion = group number, or 1+ for ammonium. | Mg2+ | Na+ |
| Work out the charge of your negative ion = group number – 8 *or* known charge for a compound ion. | Br– | SO42– |
| Rewrite the symbols; put a bracket around any compound ion. | Mg2+ Br–  Mg Br | Na+ SO42–  Na (SO4) |
| Swap the numbers of the charges and drop them to the opposite ion. | MgBr2 | Na2(SO4) |

Writing ionic equations

* Make sure all state symbols are included.
* Identify the species that are aqueous, using the rules of solubility.

1. Look at the cation – is it Group 1 or ammonium? If so → soluble.
2. Look at the anion – is it a nitrate? If so → soluble.

* Proceed only if you have ruled out 1 and 2.

1. Is the anion a halide (chloride, bromide or iodide)?
2. If so, look at the metal – lead or silver? If so → insoluble.
3. Is the anion a sulfate?
4. If so, look at the metal – barium, calcium, lead? If so → insoluble.
5. Is the anion a hydroxide?
6. If so, look at the metal – transition metal or Group 2 (after Ca)?   
    If so → insoluble.

* Split all the soluble salts into their aqueous ions on both sides – remember to write the numbers in front of the ions for multiples.
* Cancel out the ions that appear on both sides – again pay attention to numbers.
* Write your final equation (always keep the state symbols unless specifically told  
  not to!).