**5.7 CLASS WORKSHEET – CHARGES IN ELEMENTS AND COMPOUNDS**

**This is a classwork only exercise – there is no homework component**

In order to understand redox reactions, you need to be able to figure out what the CHARGES are on each atom in elements and compounds.

Example 1: sodium chloride (NaCl)

NaCl contains Na+ ions and Cl- ions; the Na has a 1+ charge and the Cl has a 1- charge

but these charges are not shown in the formula of the compound (NaCl)

Example 2: magnesium oxide (MgO)

contains Mg2+ ions and O2- ions; the Mg has a 2+ charge and the O has a 2- charge;

but these charges are not shown in the formula of the compound (MgO)

Example 3: magnesium oxide (CaF2)

contains Ca2+ ions and F- ions; the Ca has a 2+ charge and the F has a 1- charge

but these charges are not shown in the formula of the compound (CaF2)

you need 2 F- ions to make the total charge equal to zero

You can predict the charges on ions in elements and compounds using these rules:

1. **Single atoms, and atoms in elements, have no charge; the charge on these atoms is always zero (eg in Cu, Zn, Na, H2, Cl2 and O2, the charge is always zero)**
2. **Atoms in Group 1 of the Periodic Table, such as Na and K, always form ions with a charge of 1+ (Na+, K+) in their compounds; H also has a charge of 1+ in most of its compounds (eg H+)**
3. **Atoms in Group 2 of the Periodic Table, such as Ca and Mg, always form ions with a charge of 2+ (Ca2+, Mg2+) in their compounds**
4. **Al always forms an ion with a charge of 3+ (Al3+) in its compounds**
5. **Atoms in Group 7 of the Periodic Table, such as Cl and Br, usually form ions with a charge of 1- (Cl-, Br-) in their compounds**
6. **Atoms in Group 6 of the Periodic Table, such as O and S, usually form ions with a charge of 2- (S2-, O2-) in their compounds**

**Now use the above rules, with the Periodic Table, to complete the table below**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Symbol** | **Charge on first atom** | **Charge on second atom** |
| copper | Cu | **0** |  |
| chlorine  | Cl2 | **0** |  |
| sodium ion | Na+ | **1+** |  |
| oxide ion | O2- | **2-** |  |
| sodium chloride | NaCl | **1+** | **1-** |
| calcium fluoride | CaF2 | **2+** | **1-** |
| magnesium | Mg |  |  |
| hydrogen | H2 |  |  |
| hydrogen ion |  | **1+** |  |
|  | Br- |  |  |
|  | HCl |  |  |
|  | Na2O |  |  |
|  | CaO |  |  |
|  | MgCl2 |  |  |
|  | AlF3 |  |  |
|  | KI |  |  |
|  | I2 |  |  |
|  | Cu |  |  |
|  | Al2O3 |  |  |
|  | MgO |  |  |
|  | CaS |  |  |