**3.4 Compounds**

We have look only at substances consisting of only one kind of element, which are all pure substance. All other pure substances are called compounds.

**Compounds** are formed when atoms of two or more elements chemically combine in fixed proportions.

Each compound has it is own characteristic set of properties, which are quite different from those of the elements it contains.

Sodium chloride is a compound and is commonly known as salt. Salt is found worldwide and always contains 39.3% sodium and 60.7% chlorine, by mass.

**Therefore 1g of sodium chloride contains \_\_\_\_\_\_\_\_\_\_g of sodium and**

**\_\_\_\_\_\_\_\_\_\_g of chlorine.**

**and**

**5g of sodium chloride contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_g of sodium and**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_g of chlorine.**

**Comparison of Properties.**

|  |  |  |  |
| --- | --- | --- | --- |
| Properties | Sodium (metal) | Chlorine (non-metal) | Sodium chloride |
| Melts at | **98oC** | **-101oC** | **801oC** |
| Conduction as solid | **Yes** | **No** | **No** |
| Conduction as liquid | **Yes** | **No** | **Yes** |

Each of the properties tells us something about the particles present and the strength of the forces between particles (will learn about later). For the present we are interested in that sodium chloride is just one of the large number of compounds in which a metal and a non-metal are chemically combined. Such compounds tend to have similar properties to those of sodium chloride.

Water is made up of two non-metal elements. Both are gases under normal conditions, yet form a liquid when joined together. The chemical reactivity’s of hydrogen and oxygen are very different from each other and from water itself. Water is represented by the formula H2O, which means that the hydrogen and oxygen atoms are combined in the ratio of 2:1. We describe this unit of 2 hydrogen and 1 oxygen as a water molecule.

In general, a molecule is two or more non-metal atoms chemically combined. All molecules of a particular compound contain the same number of each type of atom.

|  |  |  |  |
| --- | --- | --- | --- |
| Properties | Hydrogen (non-metal) | Oxygen (non-metal) | Water |
| Melts at | **-259oC** | **-218oC** | **0oC** |
| Conduction as solid | **No** | **No** | **No** |
| Conduction as liquid | **No** | **No** | **No** |

Again each of these properties tells us something about the particles present in hydrogen, oxygen and water and the strength and forces between them.

When two non-metals chemically combined they tend to have the same properties as water.

**Text Questions 11 – 15**

**Chapter Review: 16 – 28**

**Extension: 29 - 32**