

UNIT #3 - ELEMENTS, COMPOUNDS & MIXTURES

SECTION 1: THE CLASSIFICATION OF MATTER (continued)

Chemical Change Versus Phase Change

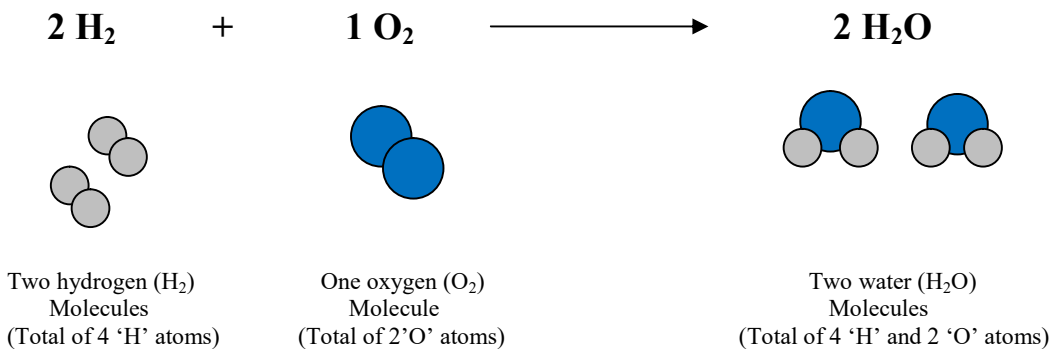
During a phase change, the molecules do not change. They simply tighten or loosen up their arrangements with neighbouring molecules.

For example pure ice is solid water. It contains nothing but H₂O molecules. Each of these molecules is touching its neighbouring molecules. They are rigidly frozen in position. None of the molecules are able to move past each other.

When we melt ice, liquid water is created. The same H₂O molecules are still there. However things have loosened up. The molecules are now free to flow past each other.

In a chemical change, the molecules are changed. New substances are created when the old bonds between atoms are broken and new bonds are formed. If you change the molecule, then you create a new type of substance.

Look at the balanced chemical equation. It shows how Oxygen (O₂) and Hydrogen (H₂) react to form a new substance - Water (H₂O).



The molecules of hydrogen and oxygen broke apart. The atoms were then free to form new bonds. This created the water molecules.

Although the molecules changed, **the total number of atoms did not change.**

We started off with 4 hydrogen atoms and two oxygen atoms. We ended up with 4 hydrogen atoms and 2 oxygen atoms.

Law of Conservation of Matter (Mass) - In a chemical reaction, atoms are not created, destroyed or changed. They simply rearrange their bonds.

If you start off with 100 grams of matter, then at the end of a chemical reaction you will still have exactly 100 grams of matter.