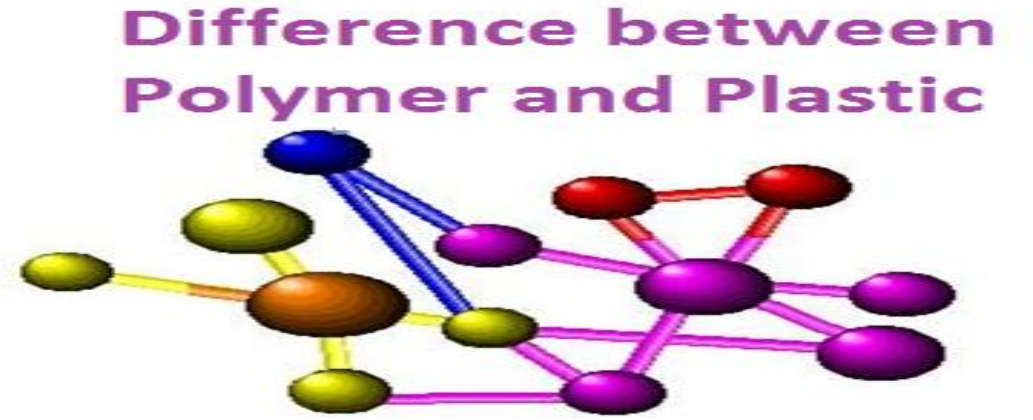
Difference between Polymer and Plastic?

What is the difference between Polymer and Plastic?

Plastics are a group of substances that can be easily folded and can be moulded into any shape. On the other hand, the compound of high molecule weight, which is the result of the polymerization process, is called polymer. Let us study through this article in detail about polymers, plastics and the differences between them.



We know that a variety of things around us is made up of plastics. Some plastics are hard or soft, colourful, some look like wood or metal etc. Plastics have changed the world. Isn't it! Do you know why we name a product as plastic because during their production they are soft, mouldable and can be changed in any other form? In Greek plasticos means 'to mould'. On the other hand Polymers are those substances which have a molecular structure built to form a large number of smaller units bonded together like several synthetic organic materials used as plastics or resins.

We can say that all plastics are polymers but not all polymers are plastics. Let us study through this article in detail about polymers, plastics and the difference between them.

Before discussing about Plastics and polymers, Let us first understand what is polymerisation?

Polymerisation

Polymerisation is a chemical process in which monomers join together to form polymers. Thousands of monomers are used to make a single polymer. There are two types of polymerisation:

1. Addition polymerisation: When with the help of catalyst, monomers are added to each other. Usually, these are alkenes like ethene and propene. Alkenes can act as monomers because they have a double bond.

2. Condensation polymerisation:

With the help of water, carbon dioxide or ammonia momomers join or polymerise. It requires two different types of monomers that can join alternately.

Do you know about the 'Plastic-eating' fungus discovered in Pakistan

What are Polymers?

Poly means many. When single molecule or monomer join together with the help of polymerisation process polymer is formed as discussed above also. That is Polymers are large molecules, which comprise of repeating monomers in a single structural unit. Here, monomers are bonded together by covalent bonds to form a polymer. Do you know that polymer has different physical and chemical properties as that of monomer? Nowadays the term polymer is commonly used in the plastics and composite industry.

Examples of Polymers: adhesives, lubricants, paints, films, fibers, plastic goods, etc. Even polymers are often formed from crude oil. However, more recently polymers have been created from corn starch and vegetable fats to form Bioplastics.

What are Plastics?

Plastic word is derived from two Greek words 'plastikos' and 'plastos' which means 'fit for moulding' and 'moulded'.
Plastics in general are referred as polymers because they are made up of polymers. On the other hand, we can define plastic as a semi-organic material derived from oil or petroleum. They have polymeric structure and are classified as synthetic and semi-synthetic polymers. Organic means that it contains carbon along with other substances.
Plastic is widely used in different forms like bottles, bags, boxes, fibers, films etc. It is formed from both condensation and addition polymerisation reactions. Also, polymer can be either biological or inorganic but plastic can't. Plastics are purely synthetic, man-made material.

Plastics are classified as thermosetting and thermoplastic polymers.

- **Thermosetting polymers**

Are also known as thermo-sets which is that they solidify into a permanent shape. They are amorphous and have infinite molecular weight.

- **Thermoplastics**

Can be heated and moulded again and again. Some thermoplastics are amorphous while some have partially crystalline structure.

Examples of Plastics:

Polyethylene Terephthalate (PET), vinyl, Poly Vinyl Chloride (PVC), polypropylene and polycarbonates like bisphenol A (BPA).
Therefore, we can say that plastics are polymers, but all polymers are not plastics. The way plastics are generated is a way of emulating nature which has created huge number of polymers. We know that plant cell wall is made up of cellulose which is a polymer and protein is also a polymer. Even DNA which is a genetic material is a polymer. Silk, wool, cotton, leather that we are using is natural polymer.