2.5 Thermoplastic and Thermosetting Polymers:

Plastics are classified based on qualities that are important for product design and selection as thermoplastic and thermosetting polymers. Thermoplastic polymers are plastics which become soft on heating and hard on cooling. The process of heating and cooling can be repeated for a number of times without affecting their properties. Ex. polyethylene, PVC etc. Thermosetting polymers are plastics undergo chemical changes and cross linking on heating and become permanently hard which cannot be softened on cooling. For example phenol-formaldehyde (Bakelite), Epoxy resin etc

Difference between thermoplastics and thermosetting polymers

Thermoplastic Polymer	**Thermosetting Polymer**
They are mostly formed by addition Polymerization	They are formed by condensation polymerization
They exhibit linear long chain structures	They have three dimensional network structure
They undergo reversible changes on heating	They undergo irreversible changes on heating
They consist polymers of low molecular weight	They consist polymers of high molecular weight
They are soluble in organic solvents	They are insoluble in organic solvents
They readily soften on heating and harden--on cooling	They do not soften on heating
There is no change in chemical composition and stricture during moulding process	They undergo chemical changes during moulding process.