

Advance level information.

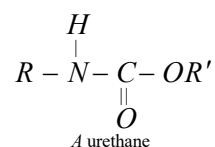
(1) Thermocol is polystyrene foamed with vapour of pentane.

(2) Cups used for hot drinks are made up of polystyrene. It does not become soft like other plastics at temperatures near boiling point of water.

(3) A major development of co-ordination polymerisation is stereochemical control. Propene, for example, could polymerise to any of the three different arrangements. Isotactic: with all methyl groups on one side of an extended chain. Syndiotactic : with methyl groups alternating regularly from side to side. Atactic : with methyl groups distributed at random. By proper choice of experimental conditions, i.e., temperature, pressure and catalyst, each of these stereoisomeric propylene has been made.

(4) Addition polymers, generally, have only carbon atoms in their main chain. On the other hand, condensation polymers, generally, have atoms other than carbon atoms, in their main chain.

(5) Polyurethanes: Polyurethanes are polymers obtained by the polymerization of a urethane. It is used for heat and sound insulation in the form of polyurethane foam. Mattresses, cushions and pillows made out of polyurethane foam are washable and long lasting.



(6) Epoxy resins: These are obtained by copolymerisation of epichlorohydrin and bisphenol-A. These resins have good adhesive strength. These are used for making adhesives (Araldite, M-seal etc.) for making glass reinforced plastic (fibre glass), for lamination, to impart crease resistance and shrinkage control to cotton, rayon and for making anti-skid surface for highways.

(7) Polycarbonates: These are obtained by copolymerisation of diphenyl carbonate and bisphenol-A. It has very high optical transparency, high impact strength over wide range of temperature. It is used for making bullet-proof glass, baby-feed bottles, fridge containers, mixi jars etc.

(8) Thermoplastics are also called cold setting polymers. They are moulded when hot but set into the required shape only on cooling. Thermosetting polymers are also called heat setting polymers. Such polymers are supplied in the partially polymerized form. When put in a mould and heated they set into the required shape. They do not require any cooling for setting.

(9) On long exposure to air and sun-light thermo-plastics becomes brittle. It is due to the evaporation of plasticizer with time. The faint smell associated with various thermoplastics is due to slow evaporation of this plasticizer.

(10) High density polyethene is a linear polymer. Carry bags made out of it are not so soft and make a crackling sound when crushed in hands. You can easily tear them in one direction, but not at right angle to it. Plastic twine is made out of such a polymer. They have very high tensile strength in one direction (along the polymer chain) and a low tensile strength at right angle to it. Such carry bags are used to carry clothes, note-books etc. Carry bags made of low density polyethene are soft, make no noise when crushed with hands, have same tensile strength in all directions. Such carry bags are used to carry heavy objects (vegetables, fruits etc.)

(11) Kevlar is a nylon-polymer and is obtained by condensation copolymerization of terephthalic acid with 1, 4-diaminobenzene (p-phenylenediamine). The fibres of this polymer are so strong that they are used to make bullet-proof vests.

(12) Lexan is a polycarbonate (polyester) and is prepared by condensation copolymerization of diethyl carbonate and bisphenol A. It has unusually high impact strength and hence is used in making bullet-proof windows and safety or crash helmets.

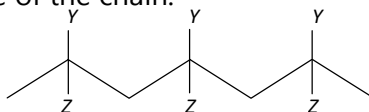
(13) Nomex is a polyamide made from m-phthalic acid and m-diaminobenzene. It is known for its fire-resistant properties and is used in protective clothing for firefighters, astronauts and race car drivers.

(14) Ebonite is high sulphur (20-30 %S) rubber and is obtained by vulcanization of natural rubber.

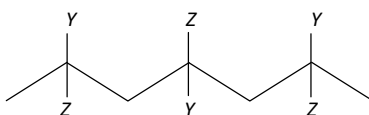
(15) Rayon was originally called artificial silk but now the name rayon is given to all fibres obtained by chemical treatment of cellulose. Thus, artificial silk is polysaccharide, i.e., cellulose derivative.

Stereochemical arrangement of polymers

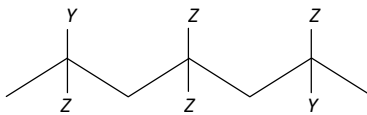
(i) Isotactic (Same order): When groups are arranged on one side of the chain. All y group i.e. on one side and all Z groups on the opposite side of the chain.



(ii) Syndiotactic (Alternating order): The Y and Z groups lie alternately on each side of the chain.



(iii) Atactic (Random order) : The Y and Z groups are arranged in a random fashion.



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