### 4.1 Addition Polymerization

Polymer synthesized by addition polymerization has the same empirical formula as that of monomer. No molecule is evolved during polymerization and the polymer is an exact multiple of the original monomeric molecule.

For example, $n\,CH_2=\underset{\displaystyle SG}{\underset{|}{CH}} \longrightarrow -\left(-CH_2-\underset{\displaystyle SG}{\underset{|}{CH}}-\right)_n$

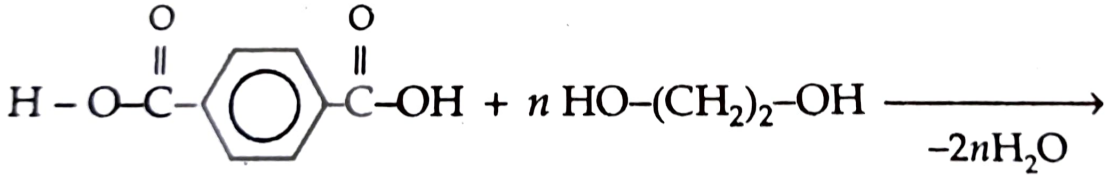
where

| –SG (Substituent group) | –H | $-CH_3$ | –Cl | $-C_6H_5$ |
|---|---|---|---|---|
| Polymer | Polyethene | Polypropylene | Polyvinyl Chloride | Polystyrene |

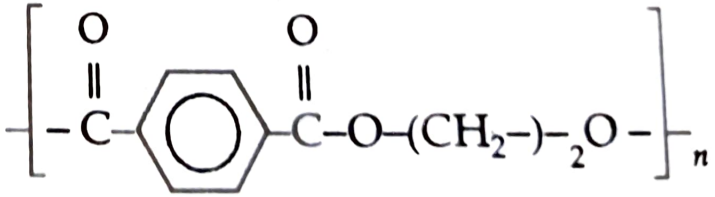
### 4.2 Condensation Polymerization

It takes place by the condensation of two different bi- or poly functional monomers having functional groups which have affinity for each other. For example, – COOH and – OH or – COOH and – $NH_2$ carring monomers undergo condensation polymerization.

It always accompanies with the elimination of small molecules like $H_2O$, HCl etc. For example :



Terephthalic acid  Ethylene glycol



Polyethylene terephthalate