

Polymerization

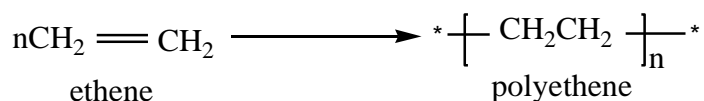
A polymer is a high molecular mass species consisting of a regular repeating units or chemically similar units, linked by primary covalent bonds.

Polymerization is the process by which high molecular mass species are formed many chemically similar units called monomers.

Types of polymerization.

1. Addition polymerization: monomers add one to each other to form polymers without loss of any molecule.

- a. Alkenes undergo addition polymerization to form polyalkenes

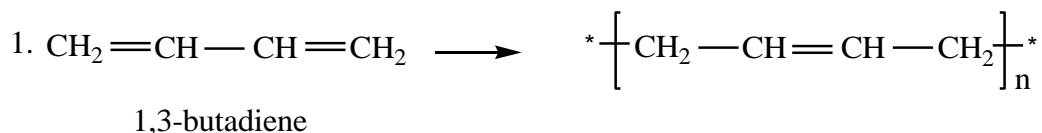


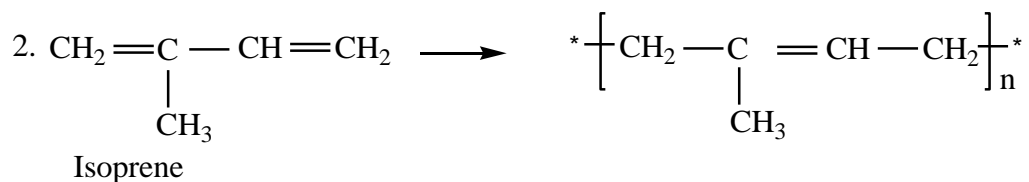
Other common polyalkenes are:

Monomer	Structure	Name of the polymer
Vinyl monomers		
Propene	$\text{CH}_3\text{CH}=\text{CH}_2$	Polypropene
Vinylchloride	$\text{CH}_2=\text{CHCl}$	Polyvinylchloride (PVC)
Vinylacetate	$\text{CH}_2=\text{CHOCOCH}_3$	Polyvinylacetate
Styrene	$\text{CH}_2=\text{CH}-\text{C}_6\text{H}_5$	Polystyrene
acrylonitrile	$\text{CH}_2=\text{CHCN}$	Polyacrylonitrile
Acrylic monomers		
Acrylic acid	$\text{CH}_2=\text{CHCOOH}$	Polyacrylic acid
Methylacrylate	$\text{CH}_2=\text{CHCOOCH}_3$	Polymethylacrylate
butylacrylate	$\text{CH}_2=\text{CHCOOC}_4\text{H}_9$	Polybutylacrylate
Methacrylic acid	$\text{CH}_2=\text{C}(\text{CH}_3)\text{COOH}$	Polymethacrylic acid
Methylmethacrylate	$\text{CH}_2=\text{C}(\text{CH}_3)\text{COOCH}_3$	Polymethylmethacrylate
Ethylmethacrylate	$\text{CH}_2=\text{C}(\text{CH}_3)\text{COOC}_2\text{H}_5$	Polyethylmethacrylate
Acrylamide	$\text{CH}_2=\text{CHCONH}_2$	Polyacrylamide

- b. Conjugated dienes undergo addition polymerization to form polydienes.

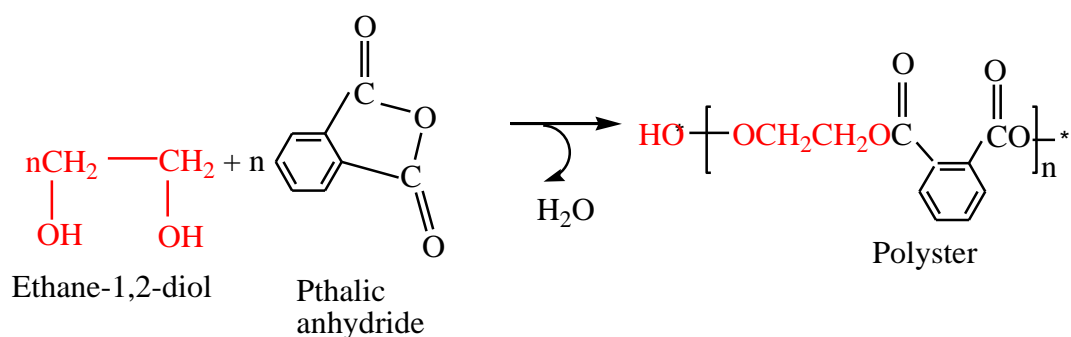
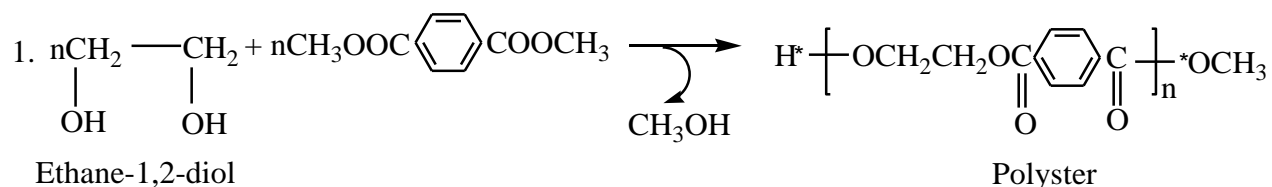
Examples



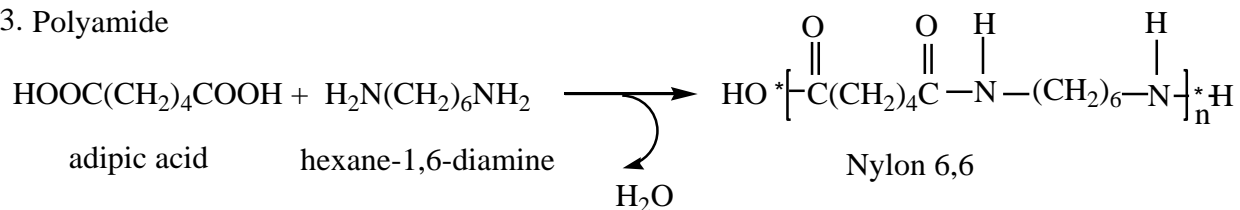


2. Condensation polymerization is formation of big molecules called polymers from small molecules called monomers accompanied by loss of small molecules such as water, ammonia e.t.c

Examples



3. Polyamide



Thermoplastic and thermosetting polymers

Thermoplastic polymers are polymers that soften and can be remolded on heating, e.g. polyethene.

Thermosetting polymers are polymers that cannot be remolded on heating. E.g. phenolic and epoxy resins.

End