Defination

• Polymers are large molecules formed by the linking up of many small molecules

• Monomers are small molecules that link up to form a polymer

• Polymerization is the reaction where many monomers link up to form a polymer

• There are two types of polymers

→ Addition Polymers

→ Condensation Polymers

Addition Polymers

• Formed by addition reaction in which many small molecules are added to each other to form a large molecule, without the formation of bi-products

• Takes place only in compounds containing carbon to carbon double bond

→ Cut off one part of double bond

→ Check what is around double bond

→ They will be place above and below the two carbons

→ Only take place on double bond

• Unsaturated monomers for saturated polymers

• Mainly plastics

→ Polyethene

→ Polypropene

→ Polycholoroethene

→ Polytetrafloroethene

→ Polyphenylethene

Condensation polymers

• Polymers formed by condensation reaction in which water is formed as bi-products

• It can be made by same or different monomers

• It has two classes

→ Synthetic polymers

→ Natural polymers

Synthetic Polymers

Nylon (Common name)

• Made with Dioic acid and Diamine

→ Dioic loses both OH

→ Diamine loses both H

• Amide linkage (C—N)

• Other name Poly Amide

• Used to make clothes, rope, tires etc

Terylene (Common name)

Synthetic Polymers (cont)

• Made with Dioic acid and Diol

→ Dioic loses both OH

→ Diol loses both H

• Ester linkage (C—^double bond O—O—R)

• Used to make cushions, mattresses etc

Natural Polymers

Carbohydrates

• Monosaccharides (monomers)

→ Glucose - simple sugars

• Disaccharides (dimers)

→ Maltose

→ Sucrose

• Polysaccharides (polymers)

→ Starch

→ Glycogen

→ Cellulose

• Glucose (loses both OH) condenses to make starch and water

• Glucosidic bond/linkage (box—O—box)

Proteins

• Amino acids (monomer)

• Polypeptide (polymer)

→ Protein

• Two amino acids (both lose H and OH) condense to make protein (poly peptide/amide)and water

• Amide linkage/Peptide linkage (N—box—C)

Fats

• Macromolecules but not polymers

• Made by reaction of one glycerol and three fatty acids

• Glycerol loses H and Fatty acids loses OH

• Ester linkage (O—C—zig zag)

+ Protein chain continues as (N—box—C—N—ColBox—C)