1. **Poly amides:**

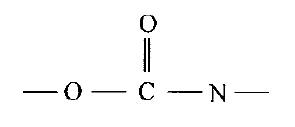
 Polyamide polymers (nylon) have amide linkages in their polymer chains .

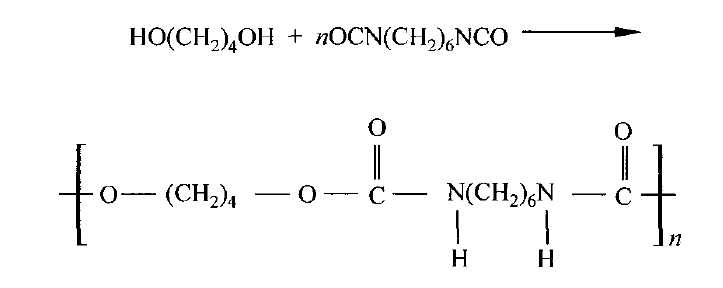
The first polyamide synthesized was Nylon-66. It was synthesized through the polycondensation of hexamethylenediamine and adipic acid . Nylon has been used as surgical sutures.



**6- Polyurethane:**

Polyurethanes are a class of polymer with urethane linkage:



Typically, polyurethane is synthesized by the reaction of dihydric alcohols and diisocyanates. For example, a crystalline polymer can be prepared by the reaction of 1, 4-butanediol and hexamethylene diisocyanate as shown below .

Polyurethane elastomers are frequently used as biomaterials due to their excellent fatigue resistant properties and biocompatibility, good blood compatibility, low toxicity, good thermal and oxidative stability, low modulus, and anti-adhesive nature.

The biodegradation of polyurethane has been extensively studied. It has been found that several factors, such as chemical agents, stress, metal ions, physiological fluids, cells and enzymes are closely related to the polyurethane degradation *in vivo*.

Polyester urethanes are generally hydrolytically unstable when implanted in the human body, and therefore, their use is limited. Poly ( ester urethanes) have been used as catheters and gastric balloons which only need to be used for a short period of time. These poly( ester-urethanes) are especially unstable in acidic environments. The acid-catalyzed hydrolysis of the ester linkage promotes further degradation of the poly( ester urethanes) by cleaving the ure­thane linkage. On the other hand, poly( ether urethanes) are hydrolytically sta­ble. But they undergo *in vivo* degradation via different mechanisms, such as auto-oxidation, metal ion oxidation and environmental stress cracking .

Because of their excellent mechanical properties and biocompatibility, segmented polyurethanes have been frequently used in the medical devices in the past two decades as blood contacting materials, such as totally implantable artificial hearts and left ventricular assist devices ( VADs) . Poly ( ether ure­thanes) were introduced as pacemaker lead insulators due to their hydrolytic stability.