



## Properties and Classification of Polymer Chemistry

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**INTRODUCTION:** Polymer chemistry is a branch of chemistry concerned with the synthetic chemistry, structure, and physical and chemical properties of polymers and macromolecules. Polymer science principles and methods are also applicable in a variety of many other chemistry sub-disciplines such as organic synthesis, analytical chemistry, and physical chemistry. Many materials, from fully inorganic metallic materials to DNA and other biological molecules, have polymeric structures; even so, polymer chemistry is typically used in the context of synthetic, organic compositions.

**DESCRIPTION:** Synthetic polymers, also known as plastics and rubbers, are widely used in commercial materials and products, and are crucial aspects of composite materials. Polymer chemistry can also be classified as polymer chemistry and even Nano devices. Hermann Staudinger, a scientist, proposed that polymers were long chains of atoms held together by covalent, which he called macromolecules. His work advanced the synthetic comprehension of polymers and was accompanied by an expansion of the ground of various polymers, which resulted in the invention of polymeric materials such as neoprene, nylon, and polyester. Polymers have been originally believed to be groupings of small molecules (colloids) held together by an unseen force prior to actually Staudinger. In 1953, Staudinger was awarded the Nobel Prize in Chemistry. Wallace Carothers invented the first synthetic rubber, neoprene, in 1931, as well as the first polyester, and nylon, a true silk replacement, in 1935. Paul Flory won the Nobel Prize in Chemistry in 1974 for his work in the 1950s on polyethylene random coil configurations in remedy. Stephanie Kwolek patented Kevlar, an aramid or aromatic nylon, in 1966. Karl Ziegler and Giulio Natta were awarded the Nobel Prize for discovering catalysts for alkene polymerization. Alan J. Heeger, Alan MacDiarmid, and Hideki Shirakawa won the Nobel Prize in Chemistry in 2000 for their work on polyacetylene and related conductive polymers. Although associated with technology itself did not find practical uses, Organic Light-Emitting Diodes (OLEDs) emerged as one. Polymer chemistry research and teaching programmes were established in the 1940s. Staudinger established the Institute for Complex molecular Chemistry

in Freiburg, Germany in 1940. Herman Mark founded the Faculty of engineering Institute of Brooklyn's Polymer Research Institute (PRI) in 1941. (Now Polytechnic Institute of NYU). Polymers are compounds with a high molecular mass that are formed through the polymerization. A monomer is a simple reactive molecule wherein the repeating permanent solution of a polymer is derived.

**CONCLUSION:** polymer could be described in a variety of ways, including its degree of polymerization, molar mass distribution, tacticity, copolymer distribution, branching extent, end-groups, crosslinks, crystalline nature, and thermal properties including such glass transition temperature as well as melting temperature. Polymers in remedy have unique properties in terms of solubilization, viscosity, and gelation. The number-average and poundage molecular weights,  $M_n$  and  $M_w$ , in both, are used to illustrate quantitative aspects of polymer chemistry. Polymers can be categorized in several of ways. Polymers, strictly speaking, make up the majority of solid matter: Nitrogen and phosphorus (i.e., the majority of the earth's crust) are mostly polymers; metals are 3-d polymers, and life forms, both living and dead, are mostly polymers and water. Plastics are frequently categorized as follows: Biopolymers, polymer blends, and inorganic polymers. Biopolymers are indeed the structure and function materials that constitute the majority of organic material found in organisms. Proteins, which are derived from amino acids, are a significant class of biopolymers. Polysaccharides, which include cellulose, chitin, and starch, are sugar-derived natural polymers. DNA and RNA are polynucleic acids made up of phosphorylated sugars with nucleotides attached that carry genetic data.

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