



Recent Advancements in Natural, Synthetic and Semi-synthetic Polymers

Fatima Mohammed*

Department of Natural Sciences and Chemistry, Government College University Faisalabad, Punjab, Pakistan

DESCRIPTION

Polymers are of natural or synthetic substances composed of large molecules known as macromolecules which are multiples several times as simpler chemical units called monomers. Polymers are present in many materials in living organisms including cellulose, proteins, and nucleic acids. They constitute the basis of minerals such as diamond, quartz, and feldspar and other materials like concrete, glass, paper, plastics, and rubbers. Numbers of monomers are very large, the compound is sometimes known as high polymer. Some of the natural polymers are composed of only one kind of monomer. Most natural and synthetic polymers are made up of 2 or more types of monomers, such polymers are called as copolymers [1].

Natural polymers

Natural polymers are extracted from nature and they all are water based polymers. These are widely used in biomedical fields such as drug delivery agents, pharmaceuticals, tissue regeneration scaffolds, and imaging agents. Natural polymers are derived from an wide variety of sources such as plants, animals, and microorganisms. Due to their similarities with the extracellular matrix, mechanical durability, high biocompatibility, and high water holding capacity natural polymers are used for skin repair and regeneration purposes [2]. Examples of naturally occurring polymers are DNA, Cellulose, Wool, silk and proteins.

Synthetic polymers

Synthetic polymers are manufactured by industry to meet people's needs. Most common type of polymers we are using every day are Nylon Threads (commonly used in our clothing, fishing nets, etc.), Polyethylene (the bulk plastic we use in packaging). These polymers can be synthesized by man in the laboratories [3]. They are commercially produced in large quantities in industries to satisfy man's needs. Plastic bags are commonly used by man every day of life. Synthetic polymers include today's plastic materials that one can encounter in their day-to-day life such as plastics used in cars, packaging material,

mobile phones, electrical appliances. These contain Polyethylene (PE), Polypropylene (PP), Polyethylene Terephthalate (PET), etc.

Synthetic polymers are usually referred as "plastics". The most of them are nylon and polythene. Polythene is the rarely used type of synthetic polymer. Polythene is mostly formed by the addition of polymers and this process is known as addition polymerization. This process is also called as chain-growth polymers. Nylon is used in fabric, Teflon in cooking utensils and Polyvinyl Chloride (PVC) is in pipes. We also use plastic kits that consist of synthetic polymers such as polyethylene, and tires of large vehicles that are manufactured with the help of Buna Rubber [4].

Examples of synthetic polymers are Polyethylene (PE), Polystyrene (PS), Polyamides (nylon), Poly (vinyl chloride) (PVC), Synthetic rubber, Teflon, Epoxy

Semi-synthetic polymers

Semi-Synthetic polymers are those polymers which are obtained by making slight changes in natural polymers under controlled conditions in the laboratory. These kinds of polymers are formed by different chemical reactions (in a controlled environment) and they are commercially important for human use.

Examples include Cellulose acetate (rayon) Mature Rubber (Sulfur is used to bind polymer chains found in natural rubber) [5].

CONCLUSIONS

- Polymers are used in daily life as PVC clothing, spandex, parachutes, sails, tents and shelters, sport shoes, wetsuits, footballs and billiard balls, snowboards, rackets,.
- In electronic and photonic technologies they used as television components, compact discs (CD), photoresists, organic field effect transistors (OFET), light emitting diodes (OLED) and solar cells, holography.
- In packaging and containers polymers used as films, bottles, food packaging, barrels.

Correspondence to: Fatima Mohammed, Department of Natural Sciences and Chemistry, Government College University Faisalabad, Punjab, Pakistan, E-mail: fatima123@gmail.com

Received: 29-Sep-2022, Manuscript No. MCA-22-18606; **Editor assigned:** 03-Oct-2022, PreQC No. MCA-22-18606 (PQ); **Reviewed:** 17-Oct-2022, QC No. MCA-22-18606; **Revised:** 24-Oct-2022, Manuscript No. MCA-22-18606 (R); **Published:** 31-Oct-2022, DOI: 10.35248/2329-6798.22.10.382

Citation: Mohammed F (2022) Recent Advancements in Natural, Synthetic and Semi-synthetic Polymers. Modern Chem Appl. 10:382.

Copyright: © 2022 Mohammed F. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

- In insulation polymers used as electrical and thermal insulation and spray foams.
- In construction polymers are widely used for garden furniture, sealing, pipes, PVC windows, flooring.
- In paints and lubricants polymers used as varnish, anti-graffiti coatings, antifouling coatings, adhesives, dispersants, non-stick surfaces, lubricants.

REFERENCES

1. Saldivar-Guerra E, Vivaldo-Lima E. Introduction to Polymers and Polymer Types. Handbook of Polymer Synthesis, Characterization, and Processing. 2013:1-4.
2. Tadokoro H. Structure and properties of crystalline polymers. *Polymer*. 1984;25(2):147-164.
3. Soldatov M, Liu H. Hybrid porous polymers based on cage-like organosiloxanes: Synthesis, properties and applications. *Prog Polym Sci*. 2021;119:101419.
4. Allen NS. Recent advances in the photo-oxidation and stabilization of polymers. *Chem Soc Rev*. 1986;15(3):373-404.
5. Roghani-Mamaqani H, Tajmoradi Z. Photoresponsive Polymers. *Sma. Sti-Re Poly Fi Gel*. 2022:53-134.