Crimson Publishers
Wings to the Research

Opinion

Polymer Electronics: An Overview

Gaur MS*

Department of Physics, Hindustan College of Science and Technology, Farah, Mathura, UP 281122, India, Affiliated to Dr. A. P. J. Abdul Kalama Technical University, Lucknow, UP, India

***Corresponding author:** Gaur MS, Department of Physics, Hindustan College of Science and Technology, Farah, Mathura, UP 281122, India, Affiliated to Dr. A. P. J. Abdul Kalama Technical University, Lucknow, UP, India

Submission: June 29, 2020
Published: July 15, 2020

Volume 1 - Issue 1

How to cite this article: Gaur MS. Polymer Electronics: An Overview. Polymer Sci Peer Rev J. 1(1). PSPRJ. 000504. 2020.

Opinion

Polymers are long-chain molecules exhibits many repeat units to form solid material. Polymers can be amorphous or semi-crystalline according to their structure. It is reasonable that the polymers that have a great number of radicals linked to the main chain are not able to have their molecules stacked as close as possible and, for this reason, the polymer chains are arranged in a disorganized manner, originating amorphous polymers. The polymers with linear chains and small groups are grouped in a more oriented form, forming crystals. As a consequence of the polymer structure, there are two types of polymers: thermoplastic and thermo fixes. Thermoplastic polymers can be conformed mechanically several times to reheating by the shear of the intermolecular bonds. Generally, linear and ramified polymers are thermoplastic and network polymers are thermofixes. Thermofix polymers do not soften with temperature since there are crossed bonds in the 3D structure. The polymers were generally considered to be electrically non-conducting and conducting. A major use of these materials was electrical insulation. However, the synthetic polymer technology over last 20 years major has been emerged and found has several day to day applications. The polymers in electronic applications recently experienced hugely impressive progress in the performance of both materials and devices. Now day's polymer and plastic materials are used increasingly in electronics applications. They are also widely using as structural components, protective materials, and even as electrically conductive materials. Polymers or synthetic metals have many considerable advantages as compared to other materials. These include for example lightness, low cost, ease of manufacturing, and high versatility. New polymer materials like polymeric blend, polymer nanocomposites have been developed for many applications and this has further increased their use in electronics for example as structural parts. The conducting polymer plays very important role in electronic industry. A lot of researches have been going on to replace traditional electronic materials like Si or Ge by conducing polymers. The conducting polymers are active material to develop new class of solar cells, sensors, photovoltaic cells, super capacitors etc However, in reliability point of view polymers may be problematic as they are typically less stable than the ceramic and metal materials because of negative effect of several parameters like humidity, temperature etc. In spite of that there are ray of hope for modification of their structural properties by different way to meet the practical requirement. Accelerated life testing (ALT) is an important technique to assess the reliability of polymers or other materials for electronics applications. The careful consideration of accelerated test conditions is needed with polymer materials to ensure that they accelerate correct failure mechanisms.

Polymer science is perhaps the most important field in the modern society catering the solutions for energy and environmental issues. In recent years significant progress has been achieved in understanding the basic principles which determine structural, thermal and electrical properties of the polymers. In last two decades, nanostructure materials such as polymer nanocomposites are receiving increased attention due to their wide spread potential applications. Polymeric materials reinforced by inorganic nanofilar are expected to exhibit improved electrical behavior, aging resistance, flame retardancy, and thermal stability. Organic–inorganic materials do not represent only a creative alternative

to design new materials and compounds for academic research, but their improved or unusual features allow the development of innovative industrial applications. The recent progress in nano-science and technology, there is an increasing interest in polymer nanocomposites both in scientific and in engineering applications, therefore, the detailed electrical properties and applications need to study. It has been earlier observed that the structure and hence the properties exhibited by polymer nanocomposites are quite different from the host polymer. The nanocomposites consist of host polymer and nanofiller. The novel nanocomposites can be developed to extend their functionalities and range of properties of polymers due reinforcement of nanofiller. Due to this reason, polymer nanocomposites are widely applied in the area of drug delivery, tissue engineering, and wound healing. The main working mechanism of these nanocomposites is to transfer the electrons under a specific electric field leads to offer more applications in various engineering fields such as sensors and robots. The merits of using electric field as an external stimulus, compared to others, which allow to precise control in terms of the duration of electric pulses, the current magnitude, and intervals between pulses. However, compared to other smart polymer systems, electroactive smart polymers have been less studied for aerospace, biomedical, space, and automotive applications. These areas are demanding area of future research. It is concluded that the field of polymer electronics has already entered its commercial phase in limited applications, such as OLED displays, and will soon call for the wider implementation of polymers and polymer nanocomposites in a number of applications.