SIGNIFICANCE OF SEMICONDUCTOR POLYMERS IN NOWADAYS. REVIEW

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ANNOTATION

In this article, we consider the processes for the production of semiconducting polymers for students of higher and secondary special education.

Key word: polymers, semiconducting polymers.

Semiconducting polymers have appeared in electronics as sources of electricity from light sources. Their importance lies in their ease of processing and stability with solution-based deposition techniques, and their low cost is important for manufacturing processes. However, in recent years, the electronic display of silicon remains simple, which limits its potential applications. For semiconductors to flourish in industry, further improvements in charge carrier mobility are required. The microstructure of the material is one of the important factors in organic semiconductors [1].

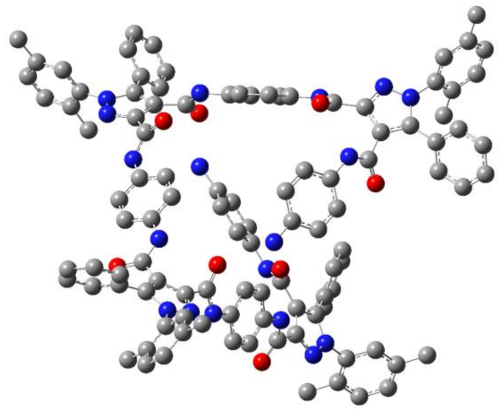
Figure 1. Semiconducting polymers for solar panels

Today, semiconductor polymers are widely used in solar cells . The interest in semiconductor polymers is growing, because these materials are characterized by a number of properties and advantages, including flexibility, processing and low cost [2]. However, high efficiency is still a challenge for these devices; Thus, many things are being done to improve efficiency. One of them is to increase the semiconductor properties by increasing the HOMO level. In the production of conjugated polymers, cross-linking reactions such as Suzuki-Miyaura, Stille or Kumada are used. However, these reactions result in low molar mass and increased dispersion [3]. For example: Suzuki-Miyaura and Stille reactions have versatility and stability against CTP of different chemical structures. However, they help reduce the slow reaction rate and the complex transmetalation process to low reactivity. The Grignard reagent was used in the method. That is, since it is formed in-situ, the reactant is important, not the external activation. Based on the first and second reactions, we can get the third reactions**.**

In recent years, the number of researchers studying semiconductor polymerferropisoceramics and especially smart materials based on polymer sensors has increased. . A number of dielectric creation fields include polymer-semiconductor polymers such as electrets, piezos, pyroelectrics, varistors, piezoresistors, and posistors. [4]. Their importance is that they are widely used in electronic and radio engineering devices. Because polymer-semiconductor and polymer-ferropiezoelectric composites have piezoresistive and posistor effects, respectively. Therefore, the sharp resistance of $BaTiO_3$ - semiconductor composites in the low temperature range can be used to create many high-sensitivity sensors [5].

Synthesis and optical properties of a novel semiconducting pyrazole-based oligomer

Pyrazole is an organic compound containing an aromatic and heterocyclic ring. It connects two nitrogen atoms to form a five-membered ring. . In particular, pyrazole derivatives have been widely studied in recent years as an important class of heterocyclic compounds. Including biologically active substances , pharmaceutical industry and chemistry optical physics medicine , manufacturing industry [6], and many other fields covered.



Therefore, the synthesis of pyrazole derivatives is the most important and interesting field today. Pyrazole-substituted polymers include light emitting diodes (LEDs) and field effect transistors (FETs) . They are used in making optoelectronic devices. Pyrazoles are divided into 2 groups according to the presence of p-electron, 1st positive and 2nd negative group. Their refractive index and chemical properties were investigated. The resulting aromatic polymers provide chemical and environmental stability. In addition, it is known that it has dozens of advantages from the economic side, such as low cost and low cost of production.

Today, semiconductors are becoming increasingly popular due to the growing need for polymers [7]. These polymers are used in a variety of electronic devices, particularly screens, sensors, energy storage cells and memory devices, as well as materials for protection against electromagnetic radiation, anti-corrosion, membrane construction, catalysis and medicine in more than a dozen fields. . These substances play an important role in miniaturization of devices and reduction of economic costs. Oxidative polymerization method is widely used to obtain semiconductor polymers. Oxidative polymerization method - in the combination of monomers, electrons are easily given and monomers are quickly oxidized. From this point of view, the term polymerization refers only to synthetic polymers, or rather to the processes used to obtain macromolecules of this type.

This method was identified by Sugimoto in 1986. In the Sugimoto method,

FeCl3 is used as a catalyst. Different monomer classes from different monomers including aromatic amines from the oxidative polymerization method; phenols, thiophenols, aromatic hydrocarbons and heterocyclic compounds. . Monomers used in oxidation polymerization usually have strong electron-donating properties and are highly susceptible to oxidation. This is evident in monomers such as aromatic amines, phenols, and thiophenols, as well as heterocycles. Nitrogen-containing benzenes can replace substances in the heterocyclic ring [8].

A new approach to the synthesis of semiconducting polymers.

Today, semiconductors are becoming increasingly popular due to the growing interest in polymers . These polymers are used in various electronic devices, especially screens, sensors, energy storage cells and memory devices, as well as materials for protection against electromagnetic radiation, anti-corrosion, membrane construction, catalysis and medicine in more than ten fields [9]. These substances play an important role in miniaturization of devices and reduction of economic costs . Oxidative polymerization method is widely used to obtain semiconductor polymers. Oxidative polymerization method - in the combination of monomers, electrons are easily given and monomers are quickly oxidized. From this point of view, the term polymerization refers only to synthetic polymers, or rather to the processes used to obtain macromolecules of this type. This method was identified by Sugimoto in 1986.[10] In the Sugimoto method, FeCl3 is used as a catalyst. Different monomer classes from different monomers including aromatic amines from the oxidative polymerization method; phenols, thiophenols, aromatic hydrocarbons and heterocyclic compounds. . Monomers used in oxidation polymerization usually have strong electron-donating properties and are highly susceptible to oxidation. This is evident in monomers such as aromatic amines, phenols, and thiophenols, as well as heterocycles. Nitrogen-containing benzenes can replace substances in the heterocyclic ring. Monomer oxidation is used as an inorganic or organic oxidant . Commonly used conductive organic polymers include polyacetylene, polythiophene, polypyrrole, and polyaniline. New copolymers of vanillin and pyrrole have been created to expand the field of application in the future. Below we will study the properties of another semiconductor polymer[11].

Study of properties of semiconducting oligomer based on symmetric pyrazole.

Pyrazole is an organic compound containing an aromatic and heterocyclic ring. It connects two nitrogen atoms to form a five-membered ring. In particular, pyrazole derivatives have been widely studied in recent years as an important class of heterocyclic compounds. Including biologically active substances , pharmaceutical industry and chemistry [12] optical physics medicine, manufacturing industry , and many other fields. Therefore, the synthesis of pyrazole derivatives is the most important and interesting field today. Pyrazole-substituted polymers include light emitting diodes (LEDs) [13] and field effect transistors (FETs) . They are used in making optoelectronic devices. Pyrazoles are divided into 2 groups according to the presence of p-electron, 1st positive and 2nd negative group. Their refractive index and chemical properties [14] were investigated. The resulting aromatic polymers provide chemical and environmental stability. In addition, it is known that it has dozens of advantages from the economic point of view, such as low cost index, low cost of production [15].

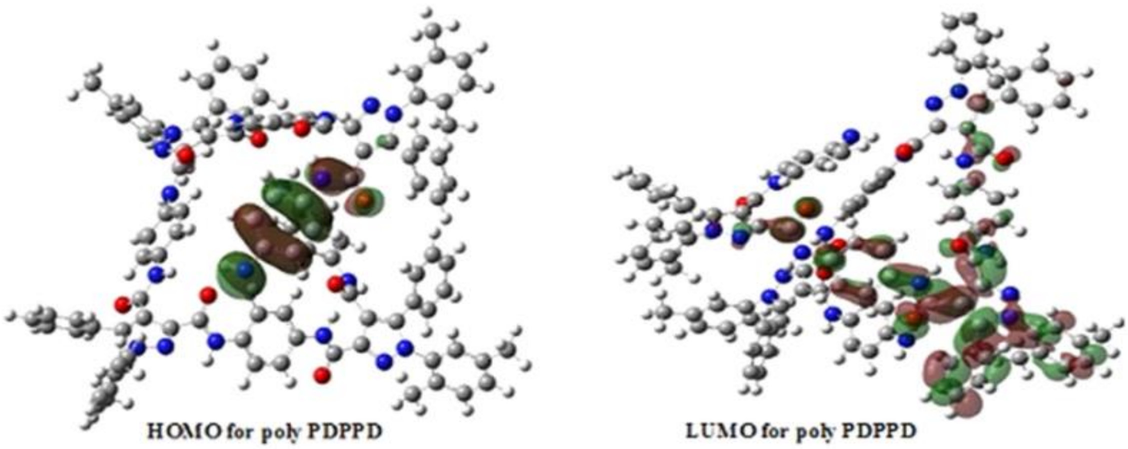


Fig. 3 HOMO and LUMO orbitals for poly(PDPPD)

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