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THE ROLE OF PHYSICS IN POLYMERS RECYCLING

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Abstract
Processing of polymers is the final stage of obtaining a product from it, and this product should be able to meet specific requirements.
Therefore, along with the discovery of various methods, new polymer materials were developed. If we look at history, in the middle of the 19th century, equipment for vulcanization of rubber, methods of acetylation and nitration of cellulose appeared. About 100 years later, plastic processing methods, their improvement, and modeling of these methods on a physico-chemical basis began to appear, and as a result, it became the basis for the creation of a new science "Polymer processing technology".
The technology of polymer processing includes the processes of obtaining rubber materials, preparation of varnish and paint, and formation of chemical fibers. Among them, the technology of plastic processing (and production) takes the main place.

Keywords: "Technology of processing polymers", vulcanization of rubber, obtaining rubber materials, preparation of varnish and paint, formation of chemical fibers.

Introduction

The scientific foundation of this direction began in 1952 (by Bernard and McKelvey). Currently, the plastic processing industry is based on new methods and equipment. Individual polymers are being replaced by polymer composites and polymer mixtures. As a result of this, the properties of materials are expanding, and opportunities are being created to obtain details from them, from consumer goods to military and space technology. Plastics recycling technology includes the following processes:
1. Changing the chemical composition, adding fillers, plasticizers to the polymer and thermomechanical processing.
2. Forming the obtained material and making a plastic product. The design of the product must be scientifically based and capable of working, taking into account the specific operating conditions. Thus, polymer processing technology includes various processes and equipment, improving the necessary (useful) properties of polymers and turning them into a finished product. When processing polymers, they are deformed, chemical reactions can occur in them, and irreversible changes in their physical properties can be observed.

The technical methods of plastic processing include: injection molding, extrusion, calendering, mixing pigments with polymers, modifying the surface of the polymer film, etc.

Casting under pressure, extrusion methods are widespread and effective methods, in which it is possible to observe the flow of polymers, that is, their physical and chemical properties do not change.

When thermoreactive materials are pressed, chemical changes occur in the material as a result of the impact of gas flame or corona discharge on the surface of the polymer film. Through the degree of crystallization, it is possible to adjust the orientation of macromolecules, to improve their mechanical properties in the production of textile fibers and films.

In this case, the material's physical properties change irrevocably, and chemical reactions do not occur during the flow. The science of rheology plays a major role in polymer processing, because deformation and fluidity are involved in polymer processing processes.

Crystallization and dielectric properties of polymers should be taken into account when processing polymers. It is also necessary to take into account the chemical reactions occurring on the surface of the polymer, and the characteristics of heat transfer. In order to increase production efficiency and improve product quality, the use of semi-automatic and automated lines, the widespread use of microprocessor equipment and industrial robots in the processing of plastics is the current demand.

It is necessary to give a good decorative treatment, finishing and marketability to the articles obtained by the processing of plastics, as well as to provide a technical and economic rationale for the field of application of the article. it is necessary to study well what product or product should be produced from each polymer and the demand for this product.

When processing polymers into plastics, rubber-technical products, lacquers and fibers, it is necessary to choose raw materials well and for this, in turn, to know the properties, structure and changes of these polymers during processing.

In the development of plastic and rubber technical products, waste may be generated (especially in reactive plastics, revulcanized rubber), which should not be burned, thrown into water, or buried in the ground (for example, containers made of polyethylene terephthalate). For this, every enterprise should develop its own environmental measures. These activities include reducing waste, recycling it, cleaning polluted air, etc. should be reflected.

Today, polymer processing enterprises in Uzbekistan and the products they produce are listed below:

1. Okhangaronlenplast: buys linoleum, pipe, film, plumbing products from PVC, PE.
2. Angren Rubber-Technical Factory: it produces rubber from rubber and produces a wide range of consumer goods and equipment.

3. Jizzakh plastic factory: started in 1972 and was one of the largest enterprises in the former union. Today, the line for obtaining 15,000 tons of polyethylene film for agriculture is in operation, and 8-10 thousand tons There is a polyethylene pipe production workshop. This line can receive gas and water pipes with a diameter of 300 mm.

4. There are several plastic processing enterprises in Tashkent. These include "Sovplastital" JV, "Spetspolimerdrenaj", "GSKB po irrigatsii" special rubber engineering plant, window frame manufacturing plant (from PVC composition) sun protection equipment manufacturing plant, etc. The Temoplast plant in KarshiShakhri has the capacity to process more than 10,000 tons of PE and PVC materials per year. Mainly, you can get pipes and films for gas and water from them. From the Fergana Valley, we can give an example of factories in the cities of Fergana and Andijan in this field.

The production of polymers began approximately in the 1970s, and at present, polyacrylonitrile, polyacrylates, various furan resins, polyamide-6, acetyl cellulose in Ferghana, KMTS in Namangan, and polyethylene in the Shurtangaz complex, which will be commissioned in 2000, at the "Navoiyazot" plant. (125 thousand tons per year) there are production enterprises. The purpose of this course is to familiarize future specialists with various modern methods used in plastic processing and to explain their physico-chemical and technological bases.

Plastic processing technology is an independent scientific and technological direction, and this course overlaps with other disciplines "Raw materials and materials used in the chemical technology of synthetic and natural high molecular compounds", "Equipment of synthetic and natural high molecular compounds chemical enterprises and fundamentals of qualification" is bound.

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