Obtaining and physical-chemical properties of polymeric materials for shoe soles

Abstract: In order to create a shoe polymer composition for the manufacture of synthetic material plantar analysis of sources of raw materials and components as well as products of large chemical companies. Grounded technological aspects of polymeric compositions, and then receiving their synthetic materilov to the bottom of the shoe.

Keywords: polymeric materials, polyurethane, polyvinyl chloride, ethylene vinyl acetate, thermoplastic elastomeric, rubbers, thermoplastic polymeric compositions.

Introduction: Footwear industry is experiencing the absence of polymeric synthetic materials for the bottom of shoes and adhesive compositions, based on local raw materials. Almost all enterprises whose activities are connected with the production of shoes of one sort or another polymer compositions shoe imports from foreign countries, mainly from China.

In the development of polymeric compositions for the production of a bottom of footwear, of particular importance is the selection of the blend components and their compatibility and optimum thermal processing modes.

Object research: For the production of shoes and component parts, in particular of soles using a wide range of artificial and synthetic polymeric materials such as polyurethane (PU), polyvinyl chloride (PVC), ethylene vinyl acetate (EVA), thermoplastic elastomeric (TPE), rubber-based mixture various types of rubbers, and thermoplastic polymeric compositions.

Analysis: The results of the analysis of the available raw materials, produced by the chemical industry of the republic, as well as research on the orientation towards the existing polymeric materials in the footwear industry, in particular in the production of sole material for the bottom of shoes, offered acceptable way possible creation of new synthetic materials for the bottom of shoes. Besides the theoretical aspects developed technology of polymer composite shoe materials possibility of their use for the production of a bottom of footwear and adhesive compositions.

In developing new formulations of synthetic polymeric materials for the bottom of shoes and the choice of the individual components of the mixture, it is necessary to take into account their properties, interoperability, sustainable use of natural resources, based on advanced equipment manufacturing technology operating shoe factories, ensuring high technical and economic indices of production of soles, heels other shoe parts.

Chemical plants republic processed natural gas and oil are produced, including unsaturated hydrocarbons and their derivatives (ethylene, propylene,
Section 1. Macromolecular compounds

Acetylene, butylenes, etc.), which are the raw material for producing high-molecular compounds.

Acrilonitrile (AN) are widely used in the synthetic rubber industry and in the manufacture of synthetic fibers. The properties of high-molecular compounds, including synthetic rubber and fibers, determined not only by the chemical nature and structural parameters of the molecular chains: their size, spatial arrangement of monomer units, the presence of branched structures, etc.

The basis product and radicals copolymerization with AN butadiene in an aqueous emulsion can be obtained copolymer AN-butadiene, i.e. nit rile rubber (NBR) with different modifications. Low temperatures NBR have better technological properties than the high-temperature, and their composites — good physical and mechanical properties.

Plastics are widely used in shoe manufacture. For the production of details of a bottom of footwear used thermoplastics that can soften when heated and acquire flow able state. In Kong rat soda plant produces caustic soda, hydrogen, chlorine. On this basis, you can adjust the production of vinyl chloride (VC), one of the ways: hydro chlorination of acetylene or thermal chlorination of ethylene, PVC and obtain polychloroprene.

Petrochemical industry is developing steadily on the advanced, modern technologies of production of hydrocarbons. In particular, it is planned to work on the organization of production of butadiene and subsequent reception of a butadiene rubber, pre-60 tons. Per year, this is a raw material for the manufacture of tires, shoes and many other kinds of Republic focuses on the development of the sector of oil and gas industry, so the main focus has been to the processing of raw materials, produced by the industry.

As the only company in the Central Asian region Gazo-chemical complex «Shurtan» (GChC) annually process 4.5 million cubes. M. of gas, produced 125 thousand. Tons. Polyethylene (PE) pellets 137 thousand. Tons. The technology used in the production of GChC, designed to produce 150 kinds of polyethylene of high, medium (linear) and low pressure (HDPE, LET HDPE). Increasing the volume of production and processing of high-quality hydrocarbons are planning to increase capacity of the complex from the current 125 thousand. Tons. up to 225 this. Tons. PE and ethylene from 140 to 250 thou. Tons. Per annum based on ethane. Today GChC consists activities of the following main parts: the processing of natural gas from the production of ethylene, co-monomer production and the production of PE granulate. Intensively engaged in the construction field GChK «Surgil» in uz yurt region. The volume of production of this complex processing is to 4 million. Cubic meters of natural gas, 362 thousand. Tons. PE pellets, 83 this. Tons. Polypropylene (PP) and 3.7 million. Cubic meters marketable natural gas, which in turn make it possible to synthesize the EVA copolymer and a thermoplastic copolymer of ethylene with propylene (EPDM).

In GCh «Shurtan» has a plant for the production of butane mixture, which is out of it in the future, can be obtained butadiene and butadiene rubber and copolymerization products of butadiene and other unsaturated compounds, such as styrene or AN (NBR) can be applied in obtaining a planter material. To build a plant for the production of PP, it is planned to establish production of VC and PVC.

Thus, the creation of new synthetic materials for the bottom of shoes taken into account the complex demands placed on them. Especially, the main attention is paid to the requirements of certain types of raw materials, as well as assessing the properties of synthetic materials used for the bottom of the shoe sole to create a polymer composition.

In this regard, the development and selection of technologies of manufacturing the material composition of the planter searched and analysis possible use of raw materials and components manufactured by the chemical industry [1]. It should pay particular attention to continuing work on the further development of industrial cooperation and localization of production, primarily on the basis of local raw materials. From the properties of the raw material are dependent operating characteristics of synthetic materials for the bottom of shoes, which significantly affect the quality of the shoes [2]. Nomenclature of the main types of raw materials used in the manufacture of synthetic materials for the bottom of shoes is very
In the manufacture of synthetic materials for footwear bottom sole as plastics materials used. The most widely used polymers such as PU, PVC, nylon and others. Designed shoe synthetic composite materials based on TPE-composites that are light, abrasion resistance and frost resistance [3; 4]. To the bottom of shoes produced various porous synthetic materials based on polymers of different chemical composition — TPE, EVA copolymers and rubber based rubber oligomers stamped and shaped form. Each of these materials has its drawbacks like, as well as advantages. In our country in the production of sole material seems most promising polymers focus on local value, which corresponds to the availability of domestic raw materials as the materials, the appropriate technological equipment involved in one production cycle and climatic features of the republic. However, these synthetic materials for the bottom of shoes is not without drawbacks, in particular they are characterized by high density, hardness values unstable, porosity, instability linear dimensions, i.e. Increased shrinkage of materials [5]. In this connection, in recent years new way of locating and methods of synthesizing the synthetic material used for the bottom of shoes, and adhesive compositions. The development of fundamentals of polymer composite materials for the footwear industry based on local raw materials, the definition of areas of practical implementation of the polymeric compositions is relevant fundamental scientific problem, because the decision which direction of results research data.

Conclusions. Synthesized by the emulsion polymerization of acrylonitrile with methyl methacrylate and vinyl acetate have a high molecular weight and narrow polydispersity. When the copolymerization of low density polyethylene and polyvinyl acetate are formed blocks having a molecular weight greater than the molecular weight the industrial sample of poly (vinyl acetate). The density and melting point of the synthesized copolymers were dependent on the ratio of components. Sudsy copolymers obtained values of AN-BMA and LDPE-VA can be used in shoe shoe soderdanii composition at the Academy of Sciences of less than 60 wt.%. LDPE-VA Copolymer synthesized a wide range of ratios of components may be used in footwear compositions.

Based butadienitrile rubber, low density polyethylene and other Ingredients obtained thermoplastic composition for bottom shoes in two embodiments. Polyethylene in GChC «Shurtan» high butene-1 and vinyl acetate thermoplastic polymers synthesized for shoe compositions. Studied technology for producing footwear of compositions based on polyethylene and poly (vinyl acetate). It was established that in order to achieve high strain-strength properties and technological parameters of processing shoe composition based on synthesized samples thermoplastics; polymeric bases should have a narrow weight molecular — mass distribution and maximum number average molecular weight.

Investigations of physical and mechanical properties of the compositions butadienitrile rubber and low density polyethylene as the vulcanizing and molding have shown that they are not inferior to the known polymer compositions on the basis of the NBR. The great advantage of using LDPE as a component of the formulation is the sole compositions, polymer compositions giving good wear resistance and high tensile strength, especially at elevated temperatures.

For strength, synthetic thermoplastic polymer composites based on shoe LDPE copolymer with polyvinyl not inferior to the cured elastomeric. The advantages offered by the polymer composition to the bottom of the shoe, and its production method is as follows: the presence of existing primary and secondary components in the existing industry and related enterprises of the republic; process is carried out at atmospheric pressure and moderate temperature; the possibility of a broad regulatory structure and physic-mechanical properties of the composition of the shoe; the use of secondary raw materials.

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Technology of thermoplastic polymeric composite materials for the bottom of shoes

Abstract: In order to create a shoe polymer composition for the manufacture of synthetic material, planter analysis of sources of raw materials and components as well as products of large chemical companies. Grounded technological aspects of polymeric compositions, and then receiving their synthetic materials to the bottom of the shoe.

Keywords: polyolefin, elastomeric, thermoplastic, adhesion, extrusion, macromolecule, a plasticizer, deformation.

Introduction. In the book [1], developed on the measures for restructuring the national economy, says decoupling from its own production imported from other CIS republics and imports of raw materials, finished products, which can be produced within the country. In this regard, the development and selection of technologies of manufacturing the material composition of the plantar searched and analysis possible use of raw materials and components manufactured by the chemical industry.

Object research. In order to manufacture a synthetic sole composite investigated and substantiated technological aspects of polymeric compositions, and then receiving their synthetic materials to the bottom of the shoe. Comparatively evaluated the physical and chemical, mechanical properties and performance characteristics of the composite materials of synthetic sole for shoes. Investigated the technological aspects of the use of synthetic polymer composite materials for the bottom of shoes.

Getting shoe thermoplastic polymer compositions and research of physical and mechanical properties, due to the development of new formulations of synthetic materials for the bottom of shoes, the need to select individual components of the mixture and the properties of Incorporation compatibility, ensuring high technical and economic indices of production. Valuable physic-chemical, mechanical and performance properties of light porous composites have contributed their wide application for the bottom of shoes, operated in different periods of seasons.

Analysis. The range of polymers of ethylene can be significantly extended give copolymers with other monomers, and also by preparing compositions in compounding. For example, based on PE and other polyolefin’s (PE type with a different type of PE, PP, rubbers, and the like) can be prepared by numerous modifications active graft copolymers with functional groups by which improved paint ability, adhesion, reduced flammability [3]. Cross linking PE is that the molecules in the chain are connected not only in series but also formed lateral links that connect the chain with each other, thereby strongly enough physical change to a lesser extent the chemical properties of the products. With increasing density increases stiffness, tensile strength, surface