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# Methods of Production of Fire Protection Products on the Basis of Inorganic Compounds

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**ANNOTATION:** The information on injuries, casualties and material damage caused by fires during the fires shows that the issue of fire protection of fabrics remains relevant. This article discusses the methods of production of fire protection products based on inorganic compounds, as well as the importance of inorganic compounds in the creation of fire-resistant fabrics in our country.

**KEYWORDS:** Inorganic compounds, fire protection products, production methods, flame retardants, materials, chemicals, polymer fabrics, local raw materials containing nitrogen and phosphorus

The high fire risk of today's textile fabrics makes modern science tasked with studying the laws of the rate of flame propagation in materials, as well as solving a topical problem such as the creation of a new generation of fire protection means - flame retardants. ydi. The burning of chemical fabrics woven from a new type of polymer fiber, which has been widely used in recent years, releases volatile toxic products that have a negative impact on the environment.

Most fires start small, but if they continue to develop, they will grow and spread, causing great damage and threatening the lives of people nearby. In addition to providing portable firefighting equipment for fire management, organizations should increase the number of general firefighting facilities and install firefighting systems to protect specific areas or equipment. is important.

It is estimated that more than 60% of those killed in fires were caused by toxic fumes and debris. Textile fabrics use a variety of inorganic and organic compounds to reduce the risk of fire. These include halogen and phosphorus compounds. In recent years, special attention has been paid to the environmental safety of firefighting equipment. In particular, attention is being paid to the development of new types of flame retardants to replace previously used fire extinguishers containing chlorine and bromine. Nevertheless, the issue of finding new effective substances that slow down the combustion of polymer fabrics and are non-toxic remains relevant.

Based on the available data on the combustion of textile fabrics, the following research and directions can be taken to solve the problem of creating fire-resistant fabrics:

1. Create heat-resistant textiles. The use of high heat-resistant fibrous organic polymers and inorganic fibers in solving the problem.
2. Development of new types of fire-retardant flame retardants to improve the fire resistance of existing natural and synthetic fibers. They are added to solutions during spinning and polymer fiber production, and used in the processing of fibers and fabrics.



Currently, the production of heat-resistant fibers such as terlon, tverlan, rusar requires large capital investments and their use is limited due to their high cost. These synthetic and man-made fibers are used to make decorative and non-woven fabrics. However, it is important that the textile fabrics used to make special work clothes are not only fire resistant, but also hygienic and environmentally safe.

A method for the production of flame retardants based on various inorganic compounds (ammophos, ammonium nitrate, ammonium sulfate, ammonia, baking soda, caustic soda, etc.) has been developed. "The optimal composition of ammophos-based flame retardants from Central Kyzylkum phosphorites was selected and their quality was improved by chemical and physical methods. The fire protection effectiveness of the obtained flame retardants was determined."<sup>1</sup>

Different proportions of boric acid and boron compounds, diammonium phosphates and other inorganic compounds. It is advisable to use this type of compound on cellulose fabrics that do not require washing. However, for decorative fabrics, the use of these drugs is not very convenient, as over time, the fabric deteriorates. Organophosphorus compounds stored in alkyl-phosphorus bonds have a special place in flame retardants.

By determining the laws of the process of formation of flame retardant compounds on the basis of local raw materials containing nitrogen and phosphorus, the mechanism of combustion and thermolysis of various materials is studied, and the effectiveness of flame retardants is evaluated. Samples of fabrics made of different materials, cotton, polyester, viscose fibers, as well as mixtures of them in different proportions, treated with pure themselves and with flame retardants, are thermally tested. It is necessary to check the fire resistance of materials made of pure cellulose treated with flame retardants of different composition. Unprocessed samples of pure cellulose fabrics and treated with flame retardant drugs are analyzed.

Experimental samples of antipyrine compounds containing nitrogen and phosphorus are developed, and they must be tested experimentally in real conditions.

Due to the importance of flame retardants, their annual industrial production is growing by an average of 10%. The demand for inorganic and organic fire extinguishers is 500,000 tons per year. In recent years, there have been opportunities to improve the composition and structure of fabrics and substances by various methods, reducing their decomposition under high temperatures, as well as their smoke-forming properties. Flame retardants based on ammophos and some other inorganic salts were obtained from Central Kyzylkum phosphorite, and ammophos samples were obtained from the treatment of phosphorite ore with sulfuric acid. The physicochemical characteristics required for the production and application of flame retardants based on ammonium phosphate and nitrate salts, such as solution density, viscosity, electrical conductivity, and saturated vapor pressure, have been determined.

In short, today there is a strong demand for fire safety equipment. Phosphorus-containing flame retardants form a liquefied vitreous layer on the surface of the material, which transfers heat from the flame to the polymer, diffuses oxygen to the surface of the fuel, and diffuses the pyrolysis products into the flame. Compounds from thermal decomposition reduce the partial pressure of oxygen in the gas phase, preventing its diffusion from the flame zone to the combustion zone. It dramatically reduces the rate of flame spread due to the reduction of free radicals in the combustion zone.

The production of fire protection products based on inorganic compounds is very important in saving lives in such adverse conditions, as well as in ensuring the safety of firefighters.

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