



INVESTIGATION OF FIRE RESISTANCE PROPERTIES OF MODIFIED NITRON FIBER

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Annotation: It has been studied the fire resistant properties of nitron fiber. The fire-protective properties of nitron fibers treated with a polymer fire retardant containing phosphorus atoms were studied. To enable comparison of the results of experimental tests of nitron fiber samples, a low-molecular fire retardant (tricresyl phosphate) was also used.

Key words: nitron fiber, fire resistant properties, chemical properties, fire retardant.

Аннотация: Исследованы огнезащитные свойства волокон нитрона, обработанного полимерным антипиреном, содержащем в своем составе атомы фосфора. Для возможности сопоставления результатов экспериментальных испытаний образцов волокон нитрона использовался также низкомолекулярный антипирен (трикрезилфосфат).

Ключевые слова: волокна нитрон, огнестойкость, химические свойства, антипирен, трикрезил фосфат.

Chemical updating of fibrous materials depending on conditions and from structure of modifiers influences physical and chemical properties of polymer, including on its stability to action of heats.

The majority of ways of giving of fireproof properties is based on use fire retardants, phosphorus containing low-molecular connection, nitrogen and sulphur which allow to slow down or exclude separate stages of burning. However, such

lacks, as volatilization, dissolution by solvents, extraction water and others are peculiar to these connections. Besides, their use negatively influences on strength properties synthetic, and also natural polymers [1].

Working out of technology of combination of process of fire-resistant furnish and dyeing various synthetic and natural polymers polymeric fire retardants for the purpose of increase of fireproof, thermal and other applied properties is rather actual problem and mentions many areas of modern chemistry of polymers, "know-how", environment ecology.

Considering the above-stated, the given research is directed on creation of theoretical bases and practical recommendations about combination of fire retardant furnish and colour formation on natural and chemical fibres. On the basis of results of researches creation of effective ways of processing and recipes of the processing structures promoting not only combination of stages of special kinds of furnish and dyeing, but also to decrease in the expense of material and fuel and energy resources is planned.

With that end in view we carried out researches on increase of fire resistance of a fibre polyacrylonitrile processed by the painting structure, containing diazotization structure «nitrite of sodium-acid-salt of metal». Then for increase of fire resistance processed with use polymeric fire-resistant, received on the basis of interaction which content monomers with halogen organic compound with triphenylphosphene, containing in the structure along with atom of phosphorus and halogens.

Samples of a nitron fibre became impregnated with a water solution phosphorous-containing polymer, and also low-molecular fire retardant – tricresyl phosphate, for the comparative analysis, with the various maintenance fire-resistant.

The carried out researches have shown, that with increase in the maintenance polymeric fire retardant fire resistance properties of fibres increases. Thus value of an oxygen index also raises. The basic thermal data of the spent researches are resulted in table 1.

Table №1. Influence of concentration polymeric fire retardant on properties of the modified samples nitron

The maintenance fire retardant, %	Oxygen index, O.I. %	Speed of ignition, second	Factor fume evolution, Nanometer of M/kg with.	Zone of the charred site, sm
0	16,0	2	785	Burns
OF*-2,0	17,2	6	734	12-16
PF*-0,5	17,6	12/13	623/654	4-7/6-9
PF-1,0	19,8	16/19	521/543	5-6/5-6
PF-3,0	24,6	22/28	420/440	3-4/3-4

On-low-molecular fire retardant (tricresyl phosphate)

Pas-polymeric fire retardant.

Represented also interest research of influence polymeric and low-molecular fire retardant on flame-retarded properties of nitron after 5-fold washing. For this purpose samples of polymer of a fibre processed water solutions fire retardant, the received samples investigated by a technique resulted in [3], results are resulted in table 2.

Table 2. Fireproof properties of the modified samples of nitron, after 5-fold washing

The maintenance fire retardant, %	Oxygen index, O.I. %	Speed of ignition, second	Factor fume evolution, Nanometer of M/kg with.	Zone of the charred site, sm
0	16,0	2	785	Burns
NA*-2,0	16,2	3	781	Burns
PA*-0,5	17,0	10/11	723/714	7-9/9-12
PA-1,0	18,6	12/15	621/743	7-9/8-12
PA-3,0	22,4	19/20	560/640	6-9/7-9

The modified samples nitron with polymeric fire retardant keep initial properties throughout the period of influence of an excited environment, i.e. they have prolonging influence. With concentration increase фосфорсодержащего polymer in a solution raise both physicomechanical and fireproof properties.

It is necessary to notice, that flame-retarded samples nitron maintain triple washings and keep initial fire-resistant properties.[4] Decrease flame-retarded properties are shown after fivefold washing.

Thus, the received results have shown perspectivity of application polymeric fire retardants in difference from low-molecular analogues for increase flame-retarded properties of a fibre nitron.

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