WEB OF SYNERGY:
International Interdisciplinary Research Journal
Volume 2 Issue 1, Year 2023 ISSN: 2835-3013
https://univerpubl.com/index.php/synergy

Methods and Means of Modification of Heterocomposite Polymer Materials

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Article Information

Received: November 29, 2022
Accepted: December 30, 2022
Published: January 31, 2023

Keywords: *Heterocomposite polymer materials (HCPM), Ultra-violet rays, polyethylene, polymers.*

ABSTRACT

In this article, we have collected scientific information about new methods of creating heterocomposite materials, their solutions and presented options and solutions.

Introduction

In order to change the structure and nature of any material, three different modifications are carried out: physical, chemical, physico-chemical. Based on the goals and objectives of the study, the most effective methods and technologies for the formation of the structure were analyzed. The effect of ultraviolet rays on the strength characteristics of heterocomposite polymer Coatings was estimated. Ultraviolet rays lead to the destruction of polymer coatings, their premature eating in atmospheric conditions.[1]

The intensity of absorption depends on the chemical composition and physical properties of polymers. At the moment, methods and methods of physical and chemical transformation of the structure of the composition have been studied well enough. Effect of coating on the property of strength in ultraviolet radiation: ultraviolet rays cause the breakdown of polymer coatings, premature failure in atmospheric conditions.[2]

The rate of failure of materials in operating conditions depends on the chemical composition of polymers. Protection of polymer materials from ultraviolet rays can be carried out through various antioxidants, light stabilizers, as well as other inert additives. Some pigments (chromium, iron , lead chromate, soot)can also play the role of light stabilizer at the same time. During the work, polyethylene (PE) coatings, which have additives of various pigment stabilizers in operating conditions due to ultraviolet rays, were studied.[3]

Analysis of literature on the Topic

The same thing was noted that until 10 hours, the radiation of PE consistency changes quite a bit. Also, effective protection of polyolefin coatings from ultraviolet rays can be achieved by treating them with aromatic amines, phenols, worms, as well as a liquid containing silicon.[4]

The principle of action of the first substances consists in The Binding of active oxygen, the violation of peroxide, as well as other active radicals that are formed in the process of wear and tear. In thermal processing, the polyorganosiloxane liquid enters the polyethylene from the surface, forming a solid system with it, in which the mechanical strength of the polyethylene coating increases, and the relative elongation decreases slightly (1.1 table) . [5]

When studying the atmosphere-resistant polycaproamide Coatings by analogy, it is worth noting that under the influence of ultraviolet rays, the process of material degradation and alkalization occurs, the weight of the molecule decreases. A change in the polymer causes an increase in the level of crystallinity. The above-molecule structure of the polycaproamide coating, which is under ultraviolet rays, undergoes significant changes, but in general, polycaproamide coatings are more resistant to exposure to ultraviolet rays than polyethylene coatings.[6]

Irreplaceable polypropylene due to ultra-violet rays changes in the physical and mechanical properties of coatings.[7]

1.1 table

Stabilizer	Mass part	Up to exploitation		After exploitation	
		σp , МПА	ε, %	σp , МПА	ε, %
without stabilizer	_	14,5	1200	pyonka is not suitable for experimentation	
actilaxibenzafenan institution	0,5 1,5	13,0 13,5	1300 1500	13,6	90
actilaxibenzafenan institution	0,5 1,5	14,6	1400	13,8	100

The effect of radiation on the property of coating strength. When polymers are irradiated, various processes as well as content changes can occur, among which it is especially worth noting cohesion and destructiveness. The specific direction to the change in composition in polymers (cohesion or destruction)is often seen as an important characteristic aspect of the material, particularly the polymer coating, and divides polymers into 2 main groups.[8]

The effect of radiation on polymer matrices

1.2 table

Decomposing polymers	Decomposing polymers
Polyethylene	Polytetrafluoroethylene
Polypropylene	Polytrifluorochloroethylene
Polystyrene	Nitrocellulose
Polyvinyl Chloride	Polymethylmethacrylate
Epoxy resin	
Phenol Formaldehyde resin	

When choosing polymer coatings based on the results of determining radiation resistance, it is necessary to take into account the duration of its use. This thing is determined primarily by the chemical nature of polymers 18 and is part of the coating composition. The radiation resistance of polymer coatings depends on their nature and the type of fillers, pigments, plasticizers,

stiffeners, etc.that is part of it. Figure 1.1 below shows the effect of radiation on the strength properties of epoxy coatings belonging to the class of polymers , in which the process of Fusion under the influence of radiation prevails.[9]

However, this thing is observed only at a relatively high level of radiation. As can be seen from figure 1.2, for coatings with a molecular weight of 1000 based on epoxide Tar of the e-41 type, hardened through polyethylene polyamines, the specificity of strength property changes in radiation up to 1·108 doses has not been determined.[10]

Methodology

The effect of ultraviolet rays on the property of durability of coatings. The strength properties of epoxy and furanoepoxide coatings are significantly increased impact resistance when processing with ultraviolet light for 30, 10 and 6 minutes. In this case, the coating will contain 15, 20 and 25 polyethylene, respectively. The impact resistance of coatings with a mass of 15 and 20 parts of polyethylene is 1.5-2 times stronger than that of non-irradiated Composite in the ultrasonic field, while the coating hardness increases almost 2-2.2 times. At one time, a reduction in the hardening process up to 8-10 times was also observed in the ultrasound area. The process of hardening of epoxy composites is determined by the amount of energy generated from the reception of solid 20 bends.[11]

Result and discussion

According to the results of the experiment, the timing of ultrasound processing of the contents of the polyethylene coating for each case was selected. So, for the composition of the polyethylene coating, processing for 5 hours was 6 minutes, for 6.5 hours-4 minutes, for 7 and 10 hours-3 minutes. The strength properties of polymer coatings in ultrasonic processing are increased due to the fact that the process of ornientation of the polymer molecule takes place. but this is when the process takes a long time.[12]

Under the influence, it is possible to observe the course of the processes of deterioration, cohesion and alcalization regeneration. Ultrasound processing shows that polymer coatings containing lightning increase the strength sensitivity. Thus, the durability of coatings containing Lightning with parts of 30 capacitance per hour increases along with the duration of the same sound, and the content goes through the maximum level with a section of 50 capacitance.[13]

Conclusions

Consistency increases from 8.1 to 13.1 kg/mm2, then decreases evenly. Working the composite with sound, which has a 100-capacity section lightning rod, reduces the durability of the coating. In the case of any Lightning, the film strength in relation to the break is of an extreme nature; When processed for up to 15-20 minutes, the film consistency increases, then decreases (in all cases, furano epoxy composites are mentioned). The property of furano-epoxy coatings, which are filled with Flint after processing with ultrasound, is associated with mechanical chemical processes. Ultrasound processing depends on the time of processing with sound to hold furano-epoxy coatings, which contain asbestos filler, increase their resistance to impact effects.[14]

In this case, when the time of processing with sound increases from 5 minutes to 20 minutes, and there is a 20-60% asbestos filler, the impact resistance increases by 20-30%, the maximum state of impact strength is 50 kgk·CM (kilograms of strength in centimeters), it is characteristic that the filler is in large quantities. However, shock resistance decreases with increasing time when there is a 100-capacity part filler in the composition.[15]

This is most likely due to the fact that the filler is not sufficiently moistened and the composite does not solidify evenly. At this time, the consistency of the film coating with asbestos filler decreases from 16 to 17 MPa after minutes when processed with sound. The change in the strength property to one side or another by ultrasonic processing is also observed again when

aluminum powder and other fillers are added to the polymer composite.[16]

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