AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Technology and Applied Sciences
ISSN (E): 2832-1766| Volume 8, | Jan., 2023

APPLICATION OF FILLERS TO CREATE COMPOSITE MATERIALS AND CREATION OF NEW PROPERTIES

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ABSTRACT	***KEYWORDS***
In this article we will use the filling for the preparation of composite materials, and what to use it for. How we apply the filler and how it helps us to create new composite materials are given information about these.	Composite materials, polymer materials, dispersed fillers, metals powder, carbovoloknites, polymides, inorganic Matrix and materials.

Introduction

The main purpose of filling for the preparation of composite materials for the design purpose is to obtain a reinforced polymer material. That is, to obtain material that has improved its physical and mechanical properties in a complex way. To achieve this, fiber-selective fillers or fine dispersing fillers, sheared glass fibers, thin metal fibers, etc.are introduced. When creating composite materials with a special property, the filler is usually introduced into the material in such a way that it gives it not a mechanical, but another, for example, electrophysical property.[1]

When obtaining initial conductive polymer materials, graphite or technical carbon-filled phenolformaldehyde and thermorreactive tar-based composites used for a number of resistors were used. After these, initially natural, then conductive elastomers based on artificial rubber, filled with technical carbon, appeared. Nowadays, fiber or dispersing fillers of different district nature are used to give the polymer material a special electrophysical property.[2]

Analysis of Literature on the Topic

Disperse fillers. To the dispersed fillers used to give the material a special electrophysical property, black soot, graphite, metal powder, sheared fiber for threading, etc.are introduced. Ferrites are

introduced for magnetic composituals, and segnetoelectrics powder (e.g. barium titanate) is introduced for segnetoelectric composite materials. Another group of dispersing fillers that many users use nowadays include polymers in the form of dispersed particles.[3]

Metals powder. Sufficiently high electrical conductivity can be achieved only at their high concentrations when metals (Cu, Al, Ni, Zn, Au, Ag) powder are introduced into the polymer. Because, the surface of the particles is in most cases covered with an oxide veil and resists the transport of the inter-particle charge. In addition to it, the polymer weighs the composite to a significant extent due to the fact that the density of the metal is many times greater than its density. These all lead to the fact that such type fillers are used only in exceptional cases. For example, in the issuance of magnetic properties to composite materials,in the electronics industry, in the preparation of electrically conductive clays, which are used to avoid details in soldering, etc.[4]

Methodology

Such clays are made with a much higher concentration of silver colloid (up to 70% mass) in order to achieve a sufficient level of permeability value in the preparation, which limits the area of application of such clays. The use of special mixing methods or the application of an unusual form of metal particles (tangent, leaf-shaped,branched, etc.) leads to a decrease in their concentration, which ensures a certain level of permeability. Depending on the type of metal ,its chemical purity, shape and size, the price of powders is determined. Some of the fillers for composite materials are given below.[5]

Carbovolocnites (ugleplasts) is a composition consisting of a polymer matrix and a reinforcement in the form of carbon fibers. Polyimides, epoxy and feiolformaldehyde resins are used as polymer matrices.[6]

Polymides-based KMU-2 and KMU2L carbovolocnites can be used up to a temperature of 300°C. They are resistant to water and chemical influences. Carboshavoloknites contain glass fibers along with coumarin fibers, which makes the material cheaper. Carbovolocnites are used in the chemical, shipbuilding and aviation industries. When ordinary polymer carbovolocnites are treated in an inert or return atmosphere, graphitized carbovolocnites or carbon matrix carbovolocnites are formed. For example, the strength and gilded viscosity of the KUP-VM type carbon matrix carbovolocnite is 5-10 times more than that of special graphite ones. Up to 2200°C when heated in an Inert atmosphere, it does not lose its consistency. Carbon matrix carbovolocnites are multiplied in the preparation of chemical apparatus.[7]

Progress of the Study

Borvoloknites are a composition consisting of polymer binding, fixing, boron fibers. Modified epoxy and polyimide binders are used to obtain borvoloknites. Borvolocnites have a high degree of compressive, slip strength, hardness, thermal and electrical conductivity. They are resistant to water and chemical influences. Items made of borvoloknites are used in space and aviation equipment (shovels and rotors of compressors, shovels of helicopter screws, etc.).[8]

Organic voloknites are compositions consisting of a polymer binder, a synthetic fiber magnifier. Elastic fibers such as Lavsan, kapron, nitron serve as a maximizer. Polyimides, epoxide and phenol formaldehyde undergo Tar binding service. Organic volocnites have a low density, a relatively large specific consistency, a high degree of enveloping viscosity. Organic voloknites are used in aviation equipment, in the electrical industry, in chemistry mechanical engineering. Boron, carbon fibers,

stringy crystals of difficult-to-liquefy compounds, tungsten or steel wires utter a maximizing service. The matrix material is selected taking into account the function of the composite material (corrosion resistance, resistance to oxidation). Light and plastic metals (aluminum, magnesium) and their alloys are used as a matrix. By volume, the amount of reinforcements is 3-50%. Metals that are armirovks with fibers are used in aviation and rocket technology. The use of composite materials requires the creation of new methods for preparing details in catarrhal cases, as well as a change in the principle of constructing machine detail rings.[9]

Results and Discussion

Depending on the nature of the component cladding, composite materials are divided into the following four groups:

1) it contains metal or metal alloy;
2) contains inorganic compounds of oxides, carbides and nitrides;
3) contains non-metallic element, carbon, boron and yes Caso li component boron;
4) the components are a combination of organic substances (epoxy, polyhydrous, phenolic and yes Caso. tar) is formed.

Composite materials have a much higher relative bickness (E/r) and relative thoroughness (a-b/p) compared to present-day structural materials. The elasticity module of the composite material can be lifted by carefully placing it in the same direction on the desired side.The reliability of composite materials is also high. In ordinary alloys, breaking and its growth goes quickly during Operation. In the composite material, the cracked finish begins with The Matrix. It can not grow, because on the way it goes to the pouring filler.[10]

In composite materials of this type, the matrix is mainly made of metal and alloy consists of. Metal-based compositions are uniform with dispersed particles

it is punctured.[11]

Dispersed particles:

1) microscopic (d = 0.01-0.1 μm);
2) it will be small (d = 1-50 μm).

Properties are isotropic.[12]

Selective compositions with dispersed particles are often obtained by the method of powder metallurgy. Main stages:

1.Obtaining a mixture of Matrix metal and powder powder (special powders are obtained by methods. Then mixed in special machines).

2.Pressing powder in steel matrices and turning into a compact zagotovka. Then its thermal performance - "spekonie" during the period of pressing, deforming and thermal performance, the product acquires an optimal, stable dislocation structure. Nickel matrix composite materials: more heat— resistant nickel alloys are sintered; in order to raise the operating time and temperature (1100-1200°C). Pukhtalov-chilar: filigree crystals (whiskers) of AI2O3, hard-soluble metal and wires of their alloys based on tungsten and molybdenum; carbon and silicon carbide fibers.[13]

Nickel and nichrome are tested by powder metallurgy method with ai2o3 threads. Such a composite characteristic: 9% AI2O3 Buisa, a b = 1800-2100 MPa, relative height 22-25 km. Heat-resistant nickel alloys are more common with tungsten-selective composites. Plastic is obtained by the deformation method: rolling, blasting welding. It is pressed hot in a vacuum: one layer is heat-resistant

nickelchromovolfram alloy XH60B, one layer is wire from W15 (d = 0.15—0.18 mm).In this way, the floor is pressed. This composite works at 1100— POO^S.The representative of such composites is BKH-1. Matrix: cast heat-resistant alloy JS6K, sinker: tungsten cable BA, D = 0.5 mm.

Composite materials based on inorganic matrix: composite materials composed of matrices based on inorganic polymers are a promising material.Typical representatives of inorganic polymer binders are: silicates, ceramics, nitrides, borides, carbides. These are easy to get. Special property: the thoroughness of the atomic bond makes up the polymer chain. The most common are ceramic composite materials. These are created on the basis of oxides of metals and oxygen-free compounds (carbides, borides, nitrides, silicides). The creation of composite metal material allows you to create a new technique: working at high temperatures, inedible, thorough, etc.[14]

Aluminum matrix composite materials: technical aluminum and its alloys are used as the composite materia Matrix: ADI, D16, SAP and others.High-strength steel (08x18h9t; 1x15h4am3; EP322 and h.k.) wires, beryllium wires, bar, silicon carbide, carbon fibers are used.The composite material is rolled, which is carefully combined with steel wires. Rolling mode temperature, deflection determined by direction and level.The Rolling temperature is determined by the temperature-loss of steel fluidity ("razuprochnenie"). For example, for Steels 08x18h9t and 12x18h10t, the Rolling temperature is 380 - 400°C, (the temperature at which these steels lose their strength is 400°C). Same 15X15H4AM3 and the Rolling temperature for EP322 Steels is 420-450°C (loss of thoroughness t = 450°C).Deformation direction when rolling is made by bending in the direction of the scrapers so that the fibers do not break during the rolling period.At enterprises the production of composite KAC-1 has been established. In this case, a dowel is a wire made of steel sinch 1x15h4am3 (diameter d - 0.15 mm). Matrix AV or SAP-1.[15]

Conclusions

Experiments show that the shock viscosity of composite marerials is demonstrated by the thermosetting effect of the thrower. In the experiment, rock Granite was taken as a model. Granite is a natural composite material. Blow

determination of the viscosity of using the pendulum's classical “sharpi” method is determined by. Dynamic consistency assessment the size of the work spent breaking the sample has been adopted. The work spent on breaking the kundalang cross section of the sample is called the shock viscosity of the material.

In composite materials, the values the structural binding energies of molecular compounds in the Matrix and filler phases lie in a wide range.It is widely used for the desired purpose, from different variations of the characteristics of substances under the influence of temperature. With a change in temperature, the oscillations of the molecules that make up the substance vary depending on the energy of the interconnection. Especially. as you know, since the main role in moving oscillation under the influence of temperature is played by the magnitude of the binding energy, when it is determined by changing the temperature with an extremely small step (values) and changing the composite heat capacity, it becomes possible to obtain information about structural molecular bonds based on changes in it.

1. A scientifically - based approach to the creation of composite materials was shown.
2. Composite materials, anti-shock and adhesion strength, determined.

3. Correlation dependencies between the vibrodempfirizing efficiency of the material and the Anti-impact strength of the coating on its basis have been established.
4. It was shown that on the basis of the elastic characteristics of the composition, one can think about its anti-shock consistency.

References

1.Azimov Sarvarbek Qayumjon ugli, Shirinboyev Mirzabek Ilhomjon ugli. (2022). DEVELOPMENT OF TECHNOLOGY FOR CREATING POLYMERIC COMPOSITE MATERIALS BASED ON POLYVINYLIDENFTORIDE AND DISPERSED FILLERS. EURASIAN JOURNAL OF ACADEMIC RESEARCH, 2(13), 828–835. https://doi.org/10.5281/zenodo.7467355
2. Ro‘zimatov Muxammadjon Abdumo’min o’g’li, Azimov Sarvarbek Qayumjon o’g’li, Shirinboyev Mirzabek Ilhomjon o’g’li, DVIGATELLARINING QUVVATI VA TEJAMKORLIGINI ORTTIRISH YO‘LLARINI TAXLIL QILISH , Новости образования: исследование в XXI веке: Том 1 № 5 (2022): Новости образования: исследование в XXI веке
3.MEN SEVGAN YETUK OLIMLAR Karimova Muyassarxon Abduqayumovna, Azimov Sarvarbek Qayumjon o‘g’li Journal of new century innovations 19 (5), 125-129, 2022
4.Muxammadjon Abdumo’min o’g’li, R. , Sarvarbek Qayumjon o’g’li, A. и Safarali Sulaymonovich, T. 2022. DEVELOPMENT OF A MACHINE FOR CUTTING COTTON. Новости образования: исследование в XXI веке. 1, 5 (дек. 2022), 192–198.
5.YER OSTI QUVURLARIGA GRUNT BOSIMI. BIR JINSLI GRUNTDA JOYLASHGAN QUVURGA GRUNTNING O ‘RTACHA VERTIKAL BOSIMI
QI Tavakkal o'g’li, SM Ilhomjon o'g'li, AS Qayumjon o'g'li - Новости образования: исследование в XXI веке, 2022
6.Muxammadjon Abdumo’min o’g’li, R. ., Sarvarbek Qayumjon o’g’li, A., & Mirzabek Ilhomjon o’g’li, S. . (2022). DVIGATELLARINING QUVVATI VA TEJAMKORLIGINI ORTTIRISH YO‘LLARINI TAXLIL QILISH. Новости образования: исследование в XXI веке, 1(5), 199–206. извлечено от http://nauchniyimpuls.ru/index.php/noiv/article/view/2305
7.Carriers lifetime in silicon bases solar cell Sarvar Azimov, Avazbek Alisherovich Mirzaalimov Молодой ученый, 97-101, 2020
8.Potential barrier in silicon solar cells Sarvar Azimov, Avazbek Alisherovich Mirzaalimov Молодой ученый, 94-97, 2020
9.Temperature characteristics of semiconductor diode Sarvar Azimov, Avazbek Alisherovich Mirzaalimov Молодой ученый, 85-89, 2020
10.Mathematical analyze of optical properties of solar cells Hajrullo Aslonov, Odilbek Dehkonboev, Sarvar Azimov Молодой ученый, 6-9, 2020
11.THE LIFETIME OF CHARGE CARRIERS IN SILICON-BASED SOLAR CELLS U Ismoilov, N Mirzaalimov, S Jurayeva, B Negmatov, S Azimov, A Alijonov, M Zulunova Deutsche Internationale Zeitschrift für zeitgenössische Wissenschaft, 27-29, 2021
12.IV CHARACTERISTICS OF SEMICONDUCTOR DIODE Jasurbek Gulomov, Sarvar Azimov, Irodakhon Madaminova, Hayrullo Aslonov, Odilbek Dehqonboyev Студенческий вестник, 77-80, 2020
13.Exploring working principle of vacuum diode by virtual laboratory Sarvar Azimov

14.Azimov Sarvarbek Qayumjon ugli, Yusupov Bunyodbek Abdukarim ugli, & Madina Zarbotova Qaxromon qizi. (2023). Important Aspects in the Application of Composite Materials and New Methods of Application. Texas Journal of Engineering and Technology, 16, 11–14. Retrieved from https://zienjournals.com/index.php/tjet/article/view/3170

15. ugli, A. S. Q. ., qizi, N. I. O. ., & ugli, S. M. I. . (2023). Areas of Creation, Promising Development and Use of Composite Material. AMERICAN JOURNAL OF SCIENCE AND LEARNING FOR DEVELOPMENT, 2(1), 16–19. Retrieved from https://inter-publishing.com/index.php/AJSLD/article/view/868