SUMMARY

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COMPOSITE ELECTROCHEMICAL COATING WITH ZINC MATRIX MODIFIED CARBON MATERIALS

The possibility of producing composite electrochemical coatings with zinc matrix of the electrolyte — based suspensions waste solutions electrochemical synthesis of graphite bisulfate.

Keywords: composite electrochemical coatings (CEC), waste solutions, graphite materials, electrodeposition.

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TECHNOLOGY DEVELOPMENT OF LOCAL NICKEL-CONTAINING GALVANIC WASTEWATER UTILIZATION USING POTASSIUM POLYTITANATES

The possibility of layered potassium polytitanates application for the utilization of waste nickel plating solutions. The influence of industrial solution parameters (nickel ions concentration, pH) on the expenditure of reagent for solution treatment to discharge standard as well as photocatalytic properties of obtained products.

Keywords: potassium polytitanate, galvanic industry, nickel, utilization, photocatalysis

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OF SCIENCES A STUDY OF THE EFFECT OF RADIO FREQUENCY CAPACITIVE DISCHARGE PLASMA TREATMENT ON INTERFACIAL SHEAR STRENGTH OF HYBRID MICROCOMPOSITE

The effect of radio frequency capacitive discharge plasma treatment of reinforcing fibers on the interfacial shear strength of hybrid composites carbon fibers and ultra-high-molecular-weight polyethylene — reinforced epoxy composites was studied. The technique of preparation and research of samples have been developed. Revealed that the plasma treatment of the fibers increases the interfacial shear strength of the hybrid composites. Shown the dependence of the interfacial shear strength of the carbon fiber content in the composite.

Keywords: hybrid fiber reinforced polymer composites, radio-frequency plasma, carbon fibers, ultra-high-molecular-weight polyethylene, interfacial properties, adhesion, interfacial shear strength, modification.

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FORMATION OF STRUCTURAL HETEROGENEITY OF EXPLOSIVE COMPACTION OF FLUOROPOLYMERS IN THE AMPOULE

The structural heterogeneity of compacts of polytetrafluoroethylene and polyvinylidenfluoride, formed due to changes in pressure along the radius of the ampoule during explosive compaction. X-ray diffraction, scanning electron and optical microscopy indicate significant differences in the structure and properties of materials of the central and peripheral zones of cylindrical compacts.

Keywords: explosive compaction, polytetrafluoroethylene, polyvinylidenfluoride, fluoropolymers structural heterogeneity

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STUDY OF MECHANICAL PROPERTIES CARBON PLASTICS BASED ON POLYETHERETHERKETONE

The structure and properties of carbon fiber reinforced PEEK. It is found that carbon composites developed exceeds the base material of the elastic modulus in compression of 1,1, and compression strength of 1,2 times.

Keywords: carbon fiber, polymer, polyetheretherketone, carbon fibers

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NEW TECHNOLOGY OXIDATIVE STABILIZATION POLYACRYLONITRILE FIBERS

The article discusses the new aspects of the process of thermal oxidative stabilization of polyacrylonitrile fibers, modified carbon nanotubes with varying degrees of oxidation of the surface. It is shown that by increasing the content of nanotubes and oxygen on their surfaces may shorten the stabilization time of the fibers in two-fold: from 60 to 120 minutes.

Keywords: polyacrylonitrile, carbon nanotubes, composit fibers, oxidative stabilization

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METHODS OF OBTAINING OF NANOCELLULOSE FROM SEMI-FINISHED PRODUCT

Interest in nanocellulose production continuously growing, so the question of searching of new raw materials to obtain nanocellulose is one of the most significant. In this article the possibility of obtaining nanocellulose from semi-finished product of high yield was investigated; the type of the changes in the morphological and chemical properties of the samples depending on the method of processing semi-finished product was considered.

Keywords: nanocellulose, microcrystalline cellulose, bleached chemical thermomechanical pulp (BCTM), morphological properties, chemical properties

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UDC 663.534

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THE TECHNOLOGY OF PRODUCING CARBONIZED LIGNIN FOR INDUSTRIAL COMPOSITE MATERIALS

The article contains research result of utilization possibilities of hydrolysis production wastes — technical hydrolysis lignin to produce nanostructured carbon material using the method of self-propagating high-temperature synthesis. The properties of the obtained material are comparable with commercial samples of technical carbon, which makes it a promising as an additive to products of synthetic rubber industry.

Keywords: hydrolysis lignin, Self-propagating high temperature synthesis

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USING THE METHOD OF DIRECT FLUORINATION BY GAS FOR MODIFYING OF POLYPROPYLENE NONWOVEN FABRICS: JUSTIFICATION OF THE CHOICE OF OPTIMUM MODES OF REALIZATION OF THE PROCESS

The possibility of using the method of direct fluorination by gas for surface modification of polypropylene non-

woven fabrics to regulate their hydrophilic-hydrophobic characteristics and give them new properties was shown. Optimal regimes of the process was proved theoretically and experimentally

Keywords: direct fluorination of gas; modification; polypropylene nonwoven fabric; hydrophobicity; hydrophilicity; antimicrobial barrier properties

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MODELING OF HEAT TRANSFER AND CURING OF A COMPOSITE REBAR IN POLYMERIZATION OVEN

In the present work, mathematical model of heat transfer and curing of a composite rebar in polymerization oven is performed. The curing of such rod occurs in the polymerization oven through infrared or thermoelectric tubular heaters. The analytical results for 8-mm diameter rod were compared with experimental data and shown a good agreement. The features of the process of non-metallic reinforcement production are shown. The temperature-speed optimization of process for 8mm rod was performed.

Keywords: composite rebar, pultrusion, infrared heaters, fiber reinforced plastic rebars

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INCREASE THE OPTICAL AND PRINTABILITY PROPERTIES OF CELLULOSE COMPOSITE MATERIALS FROM UNBLEACHED FIBROUS SEMI-FINISHED PRODUCTS BY THE COATING

The effect of the different types of pigments in the composition of coating suspensions to improvement of optical and printability properties of cellulose composite material is situated in this work. The composition was developed for double-layered coating of kraftliner made from unbleached pulp, providing an attribute level of optical and printability properties, allowing to apply different methods of multi-color printing.

Keywords: cellulose composite materials, coated cardboard, kraftliner, calcined clay, blade, roughness

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THE DESIGN OF CARBON-CARBON COMPOSITES FOR THERMAL PROTECTION

The article considers some aspects of the design of carbon-carbon composites for thermal protection, as well as the influence of their structure on the properties.

Keywords: thermal insulation, carbon-carbon composites, bonding

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THE INFLUENCE OF PREPARATION CONDITIONS OF HETEROSTRUCTURE NANOSYSTEMS OF PPT — TRANSITION METAL ON THE COMPOSITION, STRUCTURE AND PHOTOCATALYTIC PROPERTIES OF THE RESULTING MATERIALS

Potassium polytitanates were modified by Fe3+ and Ni2+ ions under different pH values. The structure, chemical composition and photocatalytic activity under visible light irradiation of obtained materials were studied. It was shown that potassium polytitanates, modified under neutral pH, have the highest photocatalytic properties in comparison with other samples.

Keywords: potassium polytitanates, nanocomposites, heterogeneous photocatalysis

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ELECTROCHEMICAL COMPOSITE COATINGS MODIFIED WITH CARBON NANOTUBES: DEPOSITION AND PROPERTIES

Electrochemical composite coatings (ECC) zinc — carbon nanotubes and zinc — nickel — carbon nanotubes are deposited. Process of ECC deposition in potentiodynamic and galvanostatic regimes is investigated. Corrosion properties of composite coatings are studied.

Keywords: electrochemical composite coatings, zinc, zinc — nickel alloy, carbon nanotubes, corrosion resistance

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THE APPLICATION OF STATISTICAL METHODS AND INFORMATION MODELING FOR DESIGN OF HIGH-TEMPERATURE PROCESSING TECHNOLOGIES

The influence of high temperature processing (HTP) modes on electrical resistance along the poly-para-phenylene-1,3,4-oxadizole carbon fibers uniformity distribution is studied. The dependences of carbon fibers electrical resistance mathematical variance on HTP and furnaces *designs are determined. The efficiency of HTP technologies design based on mathematical statistical methods and information modeling methodology is demonstrated.*

Keywords: statistical methods, information modeling, mathematical variance, high temperature treatment, carbonization, electrical resistance, carbon fiber, polyoxadiazole

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RHEOLOGICAL CHARACTERISTICS AND PROCESS OF ELECTROSPINNING OF THESOLUTIONS OFCELLULOSE TRIACETATE CONTAINING A BIOLOGICALLY ACTIVE SUBSTANCE

Rheological characteristics of the solutions of a triatsetat of cellulose (TAC) containing the biologically active substance (BAS) are investigated. It is shown that introduction of BAS solution in ethyl alcohol reduces viscosity of initial solution. Optimum compositions of the TAC forming solutions with BAS for electrospinning process are defined.

Keywords: cellulose triacetate, biologically active substance, film materials, rheology, electrospinning, nanofibrous materials

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STUDY OF STRUCTURES TEXTILE ON SPEED IMPREGNATION RATE OF GLASS REINFORCEC PLASTIC BY VACUUM INFUSION

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THE MICROSTRUCTURE AND PROPERTIES RESEARCH OF THE POLYMER MATRIX ON THE BASIS OF POLYSULFONE AND EPOXY OLIGOMERS

The results of experimental researches of properties of the polymeric material based on epoxy oligomer and polysulfone used as a binder in the manufacture of products made of glass and carbon fiber reinforced plastics are presented. The influence of the amount of the epoxy oligomer is administered in an amountpolysulfone toughness, flexural strength and glass transition temperature are reviewed. The microstructure the epoxy-polysulfone matrix is investigated and is shown that depending on the content of thermoplastic the structure of the dispersive environment and a disperse phase changes. The optimum structure of the binding is established.

Keywords: composite materials, mechanical properties, an epoxy oligomer, polysulfone microstructures

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