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Carbon fiber. Obtaining, modification, properties, applications.

© **Anna N. Nurmukhametova**,[1+] **Artur R. Khamidullin**,[2] and **Lubov A. Zenitova**[2]*
[1] *Limited Liability Company «Alabuga-Volokno», Umatex Group. State Corporation «Rosatom». Territory of the SEZ "Alabuga", Sh-2, construction 11/9. Yelabuga district, 423601. Tatarstan Republic. Russia. Phone: +7 85557 5 34 00 ext. 6114. E-mail: a.nurmukhametova@umatex.com.*
[2] *Kazan National Research Technological University. K. Marx St., 68. Kazan, 420015. Tatarstan Republic. Russia. Phone: +7 (843) 231-42-51. E-mail: zenit@kstu.ru.*

*Supervising author; +Corresponding author

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Content

Abstract

The main methods for producing a polyacrylonitrile precursor, methods for producing carbon fiber, its properties, and applications are presented. Patent research in the field of polyacrylonitrile precursor and carbon fiber. Technological problems in the subject area are identified, namely the development of technologies and equipment for producing high-strength carbon fiber, the development of technologies and equipment to reduce the cost of carbon fiber production, the development of technologies for improving the quality of carbon fiber-based composites, and the main ways to solve them are given.

Ways to solve them are developing a technology for producing a polyacrylonitrile precursor for producing high-strength carbon fibers by the wet spinning method, developing a “dry-wet” method for producing polyacrylonitrile, developing high-performance equipment for producing technical polyacrylonitrile precursor in the form of bundles, developing technologies and equipment for efficient regeneration and utilization waste, heat and emissions from the production of carbon fibers, the development of new compositions of precursors and the transition to materials with a higher linear density, optimization of the structure of carbon fiber reinforced plastic to increase strength, the development of technologies and the creation of production of modern types of binders, including the addition of nanoparticles.

The main methods for modifying the surface of a carbon fiber that are currently existing are considered.

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[106] *Patent 2534779 Russian Federation*, International Patent Classification[7] D01F 9/22, B82B 1/00, D01F 1/10, D01F 6/18. Method for oxidative stabilization of polyacrylonitrile fibers filled with carbon nanotubes. Salnikova Polina Yurievna, Zhiteneva Daria Alexandrovna, Lysenko Alexander Alexandrovich, Lysenko Vladimir Alexandrovich, Gladunova Olga Igorevna,Yakobuk Anatoly Alekseevich and others; patent applicant and patent holder Federal State Budgetary Educational Institution of Higher Professional Education "St. Petersburg State University of Technology and Design". No.2013121957/05; pending 13.05.2013; published 10.12.**2014**; Bulletin No.34. 7p.
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