
APPLICATION OF CARBON NANOMODIFIATORS IN COMPOSITES

M.A. Prokhorova

mary.prokhorova@mail.ru

Bauman Moscow State Technical University, Moscow, Russian Federation

Abstract

The purpose of the study was to analyze the tendencies of applied technologies for increasing the strength properties of materials used in various industries and construction. We provide examples of improving the performance properties by integrating nanomodifiers into other materials during the construction process. Moreover, we consider the types and classifications of carbon nanotubes and give examples of practical use of the nanomodifiers under study.

Keywords

Composites, carbon nanotubes, strength properties of the material, performance properties of the material

© Bauman Moscow State Technical University, 2017

References

- [1] Khrustalev B.M., Leonovich C.N., Yakimovich B.A., Yakovlev G.I., Pervushin G.N., Polyanchikh I.C., Pudov I.A., Khazeev D.R., Shaybadullina A.V., Gordina A.F., Ali El' Caid Mokhamed, Kerene Ya. Dispersion of multi-walled carbon nanotubes in building science of materials. *Nauka i tekhnika* [Science and Technique], 2014, no. 1, pp. 44–52.
 - [2] Yakovlev G.I., Gordina A.F., Polyanchikh I.C., Tokarev Yu.V., Pervushin G.N., Caltikov A.A., Bekmancurov M.R. Napravlennoe upravlenie strukturoy i svoystvami gipsovykh kompozitsiy [Directional control on structure and properties of gypsum compositions]. *Perspektivnye materialy v stroitel'stve i tekhnike (PMST-2014). Materialy Mezhdunarodnoy nauchnoy konferentsii molodykh uchenykh* [Future-oriented materials in construction activity and technique (PMST-2014). Proc. int. sci. conf. of young scientists]. 2014, pp. 60–67.
 - [3] Tarasov V.A., Stepanishchev N.A. The use of nanotechnology for reinforcement the polyester matrix of a composite material. *Vestnik MGTU im. N.E. Baumana. Ser. Mashinostroenie* [Herald of the Bauman Moscow State Technical University. Series Mechanical Engineering], spec. iss. “Actual problems of space-rocket and weapon system development”, 2010, pp. 207–217.
 - [4] Tarasov V.A., Stepanishchev N.A. Hardening of polyester matrix of carbon nanotubes. *Vestnik MGTU im. N.E. Baumana. Ser. Priborostroenie* [Herald of the Bauman Moscow State Technical University. Ser. Instrument Engineering], 2010, spec. iss. “Nanoengineering”, pp. 53–65.
 - [5] Tarasov V.A., Stepanishchev N.A., Boyarskaya R.P. Experimental technique for time characteristic moments definition of nanosuspension manufacturing technology process under ultrasonic exposure. *Vestnik MGTU im. N.E. Baumana. Ser. Mashinostroenie* [Herald of the Bauman Moscow State Technical University. Series Mechanical Engineering], 2011, spec. iss. “Energetic and transport machine building”, pp. 112–120.
 - [6] Tarasov V.A., Stepanishchev N.A., Romanenkov V.A., Alyamovskiy A.I. Quality and technological properties improvement of a polyester matrix of composite designs on the basis of ultrasonic nanomodifying. *Vestnik MGTU im. N.E. Baumana. Ser. Mashinostroenie* [Herald of the Bauman Moscow State Technical University. Series Mechanical Engineering], 2012, spec. iss. no. 3 “Progressive materials, constructions and technologies of rocket-space machine building”, pp. 166–174.
-

-
- [7] Cadek M., Coleman J.N., Ryan K.P., Nicolosi V., Bister G., Fonseca A., Nagy J.B., Szostak K., Béguin F., Blau W.J. Reinforcement of polymers with carbon nanotubes: the role of nanotube surface area. *Nano Letters*, 2004, vol. 4, no. 2, pp. 353–356.
- [8] Bai J. Evidence of the reinforcement role of chemical vapour deposition multi-walled carbon nanotubes in a polymer matrix. *Carbon*, 2003, vol. 41, no. 6, 2003, pp. 1325–1328.
- [9] Углеродные нанотрубки: виды и области применения [Carbon nanotubes: types and application fields]. Available at: <http://www.cleandex.ru/articles/2007/12/10/nanotubes-carbon> (accessed 12 April 2017).
- [10] Rakov E.G. Methods for preparation of carbon nanotubes. *Uspekhi khimii*, 2000, vol. 69, no. 1, pp. 41–59. (Eng. version of journal: *Russian Chemical Reviews*, 2000, vol. 69, no. 1, 35–52.
- [11] URL: <http://refleader.ru/merbewbewqas.html> (accessed 12 April 2017).

Prokhorova M.A. — student, Department of Rocket-and-Space Engineering Technologies, Bauman Moscow State Technical University, Moscow, Russian Federation.

Scientific advisor — A.I. Karnyushkin, Cand. Sc. (Eng.), Assoc. Professor, Department of Chemistry, Bauman Moscow State Technical University, Moscow, Russian Federation.
