

PAN-FIBER MATERIALS OBTAINED BY ELECTROSPINNING HIGH-TEMPERATURE TREATMENT STUDY 1

Tenchurin T. Kh., Shepelev A.D., Mamagulashvili V.G., Sharikov R.V., Gotovtsev P.M.,
Kamyshinsky R.A., Chumakov N.S., Chvalun S.N.

*NRC "Kurchatov Institute", 1, Akademika Kurchatova pl., Moscow, 123182, Russia
e-mail: tenchurin.timur@mail.ru*

At present, polyacrylonitrile (PAN) is the most advanced material for carbon fiber materials. Carbon nanofibres are promising to be used to create lithium-ion batteries and biofuel cells. Electrospinning was used to obtain fibrous materials based on PAN and its copolymers with a diameter from 200 to 700 nm (Fig.1a). Thermal stabilization of the samples was carried out stepwise in air from 235 to 270°C. Thermo-oxidized fibrous materials had a density of from 1.403 to 1.478 g / cm³. The fibers were graphitized in vacuum at a temperature above 2300°C. The morphology of the obtained fibrous materials is presented in fig.1b.

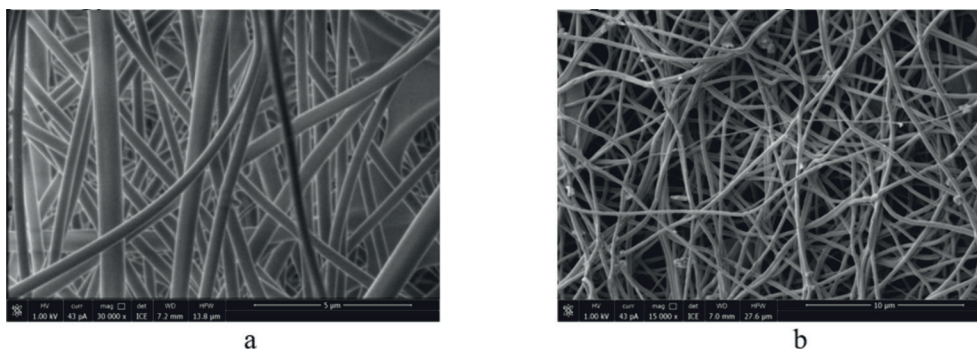


Figure. 1 Micrographs of thermo-oxidized (a) and graphitized (b) fibrous materials

The evaluation of the specific resistance of carbon material obtained as a result of graphitization of PAN fibers was carried out by the method of four-contact measurements in standard geometry and in the van der Pauw method. The results are presented in table 1.

Sample type	Surface resistance, Ohm / square	Estimated material thickness, mm	Specific resistance, mOhm · cm
PAN 1	3.2	0.28	90
PAN 2	7.5	0.12	90

The work was supported by the grant from the President of the Russian Federation for the young Russian PhD scientists state support (grant MK-6700.2018.3).