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AN EXPERIMENTAL STUDY OF THE ION THRUSTER ION-EXTRACTION SYSTEM MADE OF
THE FINE-STRUCTURE CARBON-CARBON COMPOSITE**Abstract**

Conventional materials used for the electrodes of ion-extraction system (IES) of ion thrusters (titanium and molybdenum alloys) have a number of disadvantages: relatively high coefficients of ion sputtering and thermal expansion, and the risk of intergranular corrosion. As an alternative to metal alloys, carbon-carbon materials having significantly lower coefficients of ion sputtering and thermal expansion could be used for the IES electrodes. The paper presents the results of the study of the high-density carbon-carbon composite based on the Ipresskon® preform developed by the JSC Kompozit [1] for IES electrodes. This material is characterized by an extremely small size of its structural cell (10-30 m) and low porosity, which made it possible to produce IES electrodes of complex profile configuration with a very low surface roughness [2]. The IES electrodes for the ion thruster with a beam diameter of 70 mm were manufactured at the JSC Kompozit. Ion thruster with such electrodes was tested during 1000 hours at the RIAME MAI. The paper presents the tests results and the results of the electrode microstructure studies after the tests.

References 1. E.A. Bogachev, A.B. Elakov, A.P. Beloglazov, et al. A method of manufacturing a porous base frame of a composite material // RF patent No. 2620810 state. Reg. from 05/29/2017. 2. R.V. Akhmetzhanov, V.V. Balashov, Ye.A. Bogachev, A.B. Yelakov, et al. An Ion Thruster Accelerating

