APPLICATION OF THE RADIOLUMMINOGRAPHY METHOD FOR STUDYING THE TRITIUM ACCUMULATION IN TUNGSTEN STRUCTURal DEFECTS [[1]](#footnote-1)\*)

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1,2Bobyr N.P., 1Ivanov B.V., 2Anikin A.S., 2Bukin A.N., 2Zabirova A.N., 1Mednikov A.A., 3Ignaschenko A.P., 1Spitsyn A.V.

1NRC "Kurchatov Institute", Moscow, Russia, Bobyr\_NP@nrcki.ru
2 JSC VNIINM, Moscow, Russia
3NRU MPEI, Moscow, Russia

The problem of accumulation of hydrogen isotopes in a material of modern fusion reactors (FR) is one of the most important problems of the fuel cycle and safety. In the absence of a real FR, in order to obtain preliminary data on the interaction of wall materials with hydrogen, it is necessary to conduct experimental modeling of the effects of individual factors that are expected in FR on materials and their interaction with hydrogen isotopes.

Currently, the following structural materials for FR are being studied in the world: tungsten and tungsten alloys, beryllium, bronze, low-activated steels and vanadium alloys. It is especially important to study the accumulation and release of hydrogen isotopes, in particular tritium, from materials containing structural defects.

In this work, studies of tritium accumulation in tungsten, including those containing electron-induced structural defects, are presented. The saturation of material samples with tritium from the gas phase was carried out on a REKA2 installation (JSC VNIINM) at pressures up to 106 Pa and temperatures up to 1000 K. Analysis of the tritium content in material samples was carried out using one of the promising experimental methods for studying the transport and accumulation of tritium – radiolumminography (or imaging plate technique). This method has been successfully developed at AO VNIINM in recent years and allows one to obtain a two-dimensional distribution of tritium on the surface of the sample under study with a resolution of up to 10 μm. In this work, for the first time, a qualitative study of the distribution of structural defects over the thickness of a tungsten sample is carried out. It has been shown that even a small number of defects (~10-4 dpa) can significantly increase the retention of hydrogen isotopes in tungsten.

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVIII/E/ru/IE-Bobyr.docx) [↑](#footnote-ref-1)