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## COMPUTER SIMULATION OF DIFFUSION, ADSORPTION, DESORPTION, AND $\beta$ - DECAY OF $^{89}\text{Br}$ ON THE TUNGSTEN SURFACE

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In course of construction of thermionic converter it is necessary to solve the problem of electrodes metal surface [1].

This paper presents the method and results of computer simulation of surface diffusion, adsorption, desorption, and  $\beta$ -decay of  $^{89}\text{Br}$  on the surface of single-crystal tungsten, in both case at the presence, and at the absence of  $^{133}\text{Cs}$  on it.

The simulation of all the mentioned processes was carried out by solving the system of partial differential equation with the appropriate boundary and initial conditions.

As a result of this simulation it was shown that:

- principal amount of  $^{89}\text{Sr}$  hits the surface of the tungsten collector by direct adsorption from the gas phase and not at the expense of  $\beta$ -decay of  $^{88}\text{Kr}$ ,  $^{89}\text{Kr}$ ,  $^{89}\text{Rb}$ ,  $^{89}\text{mY}$  and  $^{89}\text{Y}$  in the adsorption layer.
- joint diffusion and desorption of  $^{89}\text{Sr}$  with the presence on the surface of  $^{133}\text{Cs}$  is faster than a single  $^{89}\text{Sr}$ .

### Literature

1 D.Yu. Lyubimov, I.I. Fedik, A.A. Shumilov, "Effet of fission products on the output power of thermionic EGC with communicating and separated fuel-element cavities and in interelectrode gap", Atomic Energy, 2011, Vol. 110, № 6, p. 395-404.

2 Ya.E. Geguzin, "Diffusion by real crystal surface" in Surface diffusion and ..., Nauka, Moscow, 1969, p. 11-77.

3 R.Ya. Kucherov, D.Yu. Lyubimov, L.G. Smirnov, et al., "Modeling physicochemical processes on the surface of niobium-oxygen collector in a thermionic", Materialovedenie, 2002, № 7, p. 11-17.

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