PRODUCTION OF HIGH QUALITY PALLADIUM-103 ON CYCLOTRON

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The attention to a palladium- 103 radionuclide, including in Russia, has arisen rather for a long time (1-3) due to its nuclear- physical characteristics. It has a half-life 17 days (4) and irradiates KX-rays with an energy 20.55 KeV (5). Palladium-103 is interesting not only as a source of low energy radiation, but also as a generator of a radionuclide rhodium-103m (6).

In the last years the interest in this radionuclide has increased sharply perhaps owing to definite successes in applying of palladium-103 in brachytherapy and in the treatment of prostate cancer (7,8).

In this connection we have developed the production technology of palladium-103 with high specific activity and high chemical and radiochemical purity. The target represents a copper base, the plate from metallic rhodium is diffusively welded on which one.

The technology of the target processing, based on literary publications, consists of following main stages:

- separation of the irradiated rhodium plate from the copper base;
- dissolution of the irradiated rhodium plate using alternating-current;
- separation of palladium-103 from rhodium by chloroform extraction of a complex of palladium with dimethylglyoxime;
- transfer of palladium-103 in solution of 1N hydrochloric acid.

The developed technique allows to receive the product with the following characteristics:

- specific activity not less than 2 Ci/mg
- radionuclide purity more than 99.99 %;
- content of rhodium not more than 2 μg/mCi.

In this year we will be ready to make routine production of palladium- 103 up to 200 Ci per year.

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