

**$^{228}\text{Ra} - ^{228}\text{Ac} - ^{228}\text{Th}$ RADIONUCLIDE GENERATOR BASED
ON A REVERSE-TANDEM SEPARATION SCHEME**

Dadakhanov J.A.^{1,2}, Velichkov A.I.^{1,3}, Karaivanov D.V.^{1,3},
Temerbulatova N.T.^{1,4}, Marinov G.M.¹, Filosofov D.V.¹

¹ Joint Institute for Nuclear Research, ul. Joliot-Curie 6, Dubna, Moscow region, 141980
Russia; ² Institute of Nuclear Physics, Academy of Sciences of Uzbekistan Republic, Ulugbek,
Tashkent, 100214 Uzbekistan; ³ Institute for Nuclear Research and Nuclear Power
Engineering, Bulgarian Academy of Sciences, Tsarigradsko shose 72, Sofia, 1784 Bulgaria;
⁴ Institute of Nuclear Physics of the Kazakhstan Republic, ul. Ibragimova 1, Almaty, 050032
Kazakhstan

E-mail: dadakhanov@jinr.ru

Ac-228 is formed as a daughter decay product of Ra-228. The aim of the work is to separate ^{228}Ac and ^{228}Th from the parent isotope ^{228}Ra , and simultaneously from each other. The distribution coefficients of ^{225}Ac , ^{227}Th and ^{223}Ra between cation- exchange resin Dowex 50W \times 8 200-400 mesh, NH_4^+ form, Chelex-100 Resin 200-400 mesh, NH_4^+ form, TODGA and UTEVA on the one hand and mixed solutions of $\text{CH}_3\text{COOH} - \text{CH}_3\text{COONH}_4$, on the other. A number of modifications of the operation of the $^{228}\text{Ra} - ^{228}\text{Ac} - ^{228}\text{Th}$ generator based on reverse separation schemes have been investigated. As chemical basis were used the studied generator systems: cation exchanger - ammonium acetate solution and acetic acid solution. As a tandem was selected a column with TODGA resin. The optimal operation setup of the $^{228}\text{Ra} - ^{228}\text{Ac} - ^{228}\text{Th}$ generator based on the reverse-tandem scheme with periodic transfer of the parent radionuclide to the liquid phase has been determined.