EFFICIENCY OF SOLID ISOL METHOD FOR FUSION-EVAPORATION REACTIONS

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The experiments devoted to investigation of applicability of the solid ISOL method for separation of products of heavy ion induced reactions were carried out at the mass separator MASHA [1]. The measurements of the efficiency and separation time were made for short-lived isotopes of mercury and radon produced in the fusion-evaporation reactions $^{40}Ar + {}^{144}Sm$, ^{166}Er.

The restriction of the method with respect to the separation efficiency were found at beam intensities of ~ 0.5 pμA. A working stability of the hot catcher made of porous graphite was studied. The prospects of use of carbon nanotube paper as material of the hot catcher are shown. The times of mercury beam formation were measured for three coverings of the vacuum chamber of the ECR ion source aimed at increasing the separation efficiency. A new design of the ECR ion source and hot catcher is proposed for experiments on the mass measurement of isotope ^{283}Cn, produced as an α-decay product of ^{287}Fl in the reaction $^{48}Ca + {}^{242}Pu$. A special chemical inert glass-enamel coating will be used to cover the inner surface of the vacuum pipelines and chambers with the purpose to increase the separation efficiency. The whole separation system will be heated up to 300°C.

1. A.M.Rodin *et al*. // Instr.Exp.Tech. 2014. V.57. No.4. P.386.