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CARBON NANOMATERIALS APPLICATION FOR ISOL-METHOD OF HEAVY ION FUSION REACTION PRODUCTS

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The experiment directed to the study of a new carbon nanomaterials application was performed on the U-400M heavy ion beam at MASHA facility, FLNR, JINR. In the present speech a new technical improvements will be discussed such as usage of thin carbon nanotubes paper (thickness 6.4 mg/cm2) and graphene (thickness 1.1 mg/cm2) in reaction products catcher block unit. The main goal of the experiment was to determine radiation resistance of these materials for ISOL method. Previous experimental researches performed with thermally expanded graphite hot catcher showed an incompatibility with high intensity beams [1]. Measurements via new carbon nanomaterials showed also decreasing of the separation time for mercury in reaction 144Sm(40Ar, xn)184-xHg. Thus, it became possible to gain statistics and to analyze 6n-evaporation channel decays (178Hg) with the $T1/2$=0.266 s at the focal plane data acquisition system. Early separation time measurements performed by beam interruption method [2] showed average separation time for mercury 1.8±0.3 s. The improvements of ISOL method application allow synthesizing new products at the beam intensities up to 0.5 pmkA and even more for the SHE factory perspective. Consequently, the experiment with carbon nanotubes paper demonstrated perspectives for the fusion reaction products separation at MASHA facility due to its radiation resistance and response time.

1. V.Yu.Vedeneev, A.M.Rodin, L.Krupa, et.al.: The current status of the MASHA setup. Hyperfine Interactions (2017) 238: 19. Proceedings of the 10th International Workshop on Application of Lasers and Storage Devices in Atomic Nuclei Research: "Recent Achievements and Future Prospects"(LASER 2016).
2. A.M.Rodin, A.V.Belozerov, E.V.Chernysheva, et.al.: Separation efficiency of the MASHA facility for short-lived mercury isotopes. In: Proceedings of the 9th International Workshop on Application of Lasers and Storage Devices in Atomic Nuclei Research "Recent Achievements and Future Prospects" (LASER 2013). pp. 209–220. Springer (2013)

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