

New radionuclides for personalized medicine (theranostics)

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The investigations of the processes and mechanisms of medium-range nuclear systems (formed in reactions with protons) formation, with the evaporation of one or more nucleons in the final stages, are not only the significant fundamental task, but also have practical importance. These tasks become particularly relevant for production of medical radionuclides which are used for effective early diagnosis and treatment of various localized oncological tumors. Applying these radionuclides in radiotherapeutic and diagnostic (Positron Emission Tomography and Single Photon Emission Computed Tomography) methods one can realize unique techniques for non-surgical treatment of tumors with their precise visualization. The merging radionuclide imaging methods with methods of radionuclide therapy to Theranostics, it can give us an excellent result for the treatment and diagnosis of a cancer with minimal side effects. Therefore in present work the experimental and theoretical studies of the nuclear reactions excitation functions with the targets of ^{117}Sn and ^{119}Sn in energy range 6-20 MeV were carried out. For these reactions the cross-sections of antimony radionuclides (can be considered as the prospective for Theranostics methods) which are formed in the output channels have been obtained.

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