MULTINUCLEON TRANSFER IN REACTION ^{18}O(10MeV/A) + Ta

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The availability of new radioactive ion beams has broadened the study of nuclear structure and nuclear reactions. The main mechanism to produce the secondary beams is the fragmentation of the projectile. Alternative method for the production of the exotic nuclei is the multinucleon transfer. This type of transfer reactions occurring in low-energy collisions of heavy ions is currently considered to comprise the most promising method for the production of new heavy neutron-rich nuclei, which could be not obtainable by other reaction mechanisms. For instance in the case of the neutron–rich isotopes, that could lead to the higher survival probability. We measured production cross section for the B, C, N and O isotopes in the reaction ^{18}O + Ta and the beam energy at 10 MeV/*A* (Fig.1). The cross-sections were obtained by integrating the momentum distributions of the isotopes. We compare the extracted cross-sections to the fragmentation cross-sections. It was shown that in deep inelastic processes the production yields of different isotopes could be well described using statistical models, and could also be explained by the reaction Q-value taking into account pairing corrections (Q_{gg}-systematics) [1, 2].

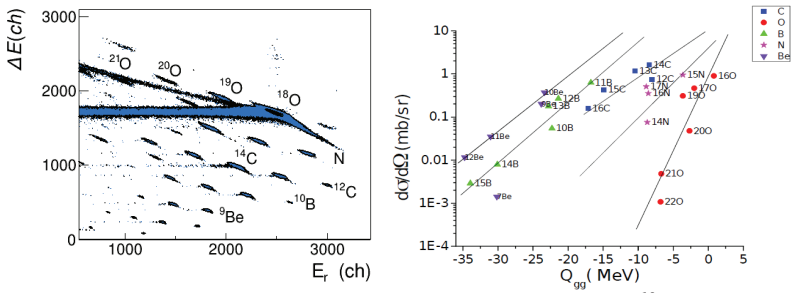

Fig.1 Left panel: Identification matrix ΔE–E_r of the products of the ^{18}O(10MeV/A) + Ta reaction. Right panel: Q_{gg} systematic for the ^{18}O(10 MeV/A) + Ta reaction products.

1. V.V.Volkov // Phys. Rep. 1978. V.44. P.93, and references therein.
2. V.V.Volkov // Treatise on Heavy-Ion Science. V.8, ed. D. Allan Bromley (Plenum, 1989). P.101 and references therein.