Abstract Submitted
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New nuclide, ^{14}F[1] V.Z. GOLDBERG, B.T. ROEDER, G.G. CHUBARIAN, A.A. ALHARBI, A. BANU, M.M. MCCLESKEY, E. SIMMONS, G. TABACARU, L. TRACHE, R.E. TRIBBLE, Texas A&M University, G.V. ROGACHEV, E.D. JOHNSON, M.L. AVILA, J.P. MITCHELL, Florida State University, C. FU, Indiana University — Long ago the instability of ^{14}F was estimated to be ∼2.58 MeV. Recently, properties of ^{14}F and other 2s-d shell nuclei were calculated in the framework of an ab-initio approach. However, no experimental data are available on ^{14}F. We used the Thick Target Inverse Kinematics method (TTIK) to study the excitation function for the ^{13}O+p elastic scattering where ^{14}F is the compound nucleus. The ^{13}O ($T_{1/2}$ = 8.6 ms) secondary beam was made with intensity 5x10^3 pps via the ^{1}H(^{14}N,2n) reaction with a ^{14}N primary beam at 38 MeV/u from the Texas A&M Univ. cyclotron. To apply the TTIK method, we degraded the ^{13}O energy to 11 MeV/u. As a result of the study, we obtain data on the ground and several excited states in ^{14}F, their excitation energies, quantum characteristics and the widths of the resonances. The mass excess of ^{14}F (M-E) was found to be 31960±50 keV. ^{14}F appeared to be more stable than the corresponding estimations based on different extrapolations. Probably the unexpected lower instability is a result of rather pure single particle structure of the ground state in ^{14}F.

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