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Particle decay from the states of $^{18}Ne^*$ in the $^{14}O + \alpha$ interaction CHANGBO FU, V.Z. GOLDBERG, A.M. MUKHAMEDZHANOV, G.G. CHUBARIAN, Y. ZHAI, T. AL-ABDULLAH, M. MCCLESKEY, L. TRACHE, R.E. TRIBBLE, Texas A&M University, G.V. ROGACHEV, Florida State University, B. SKORODUMOV, University of Notre Dame — By using a 32.7 MeV ^{14}O beam provided by the MARS at the TAMU and the modified thick target inverse kinematics technique, we have measured the excitation functions for the (α, p), $(\alpha, 2p)$, and (α, α). Excitation functions for the elastic alpha scattering manifest many strong resonances in the excitation region 0-11 MeV. By measuring coincident protons, we have found that sequential decay dominates the two proton emission process of the ^{18}Ne compound nuclei. We also found that two proton decay of a state at 8.45 MeV in ^{18}Ne demonstrates the properties of the decay by a correlated proton pair. With an assumption of ^{2}He decay, we calculated the relative energy between the 2 protons from this level using the Faddeev approach with first rank Yamaguchi separable potential.There is a good agreement between the experiment and calculations. We also demonstrated that measurements of the TOF for protons in the TTIK method can be used to identify reactions occurring at different places in the gas target, thus making it possible to identify the (α, p) reaction for astrophysical interesting.

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