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Single and Double Protons from the ^{14}O+α Interaction C. FU, V.Z. GOLDBERG, G.V. ROGACHEV, G.G. CHUBARIAN, M. MCCLESKEY, Y. ZHAI, T. AL-ABDULLAH, L. TRACHE, A. BANU, R.E. TRIBBLE, CYCLOTRON INSTITUTE, TEXAS A&M UNIVERSITY TEAM — The proton production in the ^{14}O+α interaction is important because it determines the onset of the high-temperature rp-process. The 2p decay is of current interest in relation with a possibility of a correlated 2p-pair decay from the excited states in ^{20}Ne. There are evident experimental difficulties to obtain reliable information on each of the processes in question. To solve these problems we produced an ^{14}O beam at the K500 Cyclotron at Texas A&M University using MARS. A system of double photmultiplyers looking at thin plastic scintillators provided for information on the intensity of the ^{14}O beam, beam contaminations, and a "start" signal for the proton identification by the time of flight method. The ^{4}He(^{14}O,p) and ^{4}He(^{14}O,2p) reactions were studied using the Thick Target Inverse Kinematics method. TOF between Si detectors and the PM system provided for the overall time resolution ($\sim$1ns), which was enough for reliable identification of single protons from α particles as well as for the identification for proton decay from the highly excited states in ^{17}F. The double proton events were detected as coincidence events in a system of 16 Si detectors. Over 4000 double proton events were accumulated which showed strong correlation between energies of the protons.

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