

Preliminary Results of the Study of $^3\text{He} + \text{T}$
Reactions at Low Bombarding Energies
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The study of $^3\text{He} + \text{T}$ reactions at low bombarding energies (below 1 MeV) is very interesting from different aspects. First of all, the Barshay-Temmer theorem ¹⁾ dealing with isospin conservation, could be tested by measuring the symmetry of the differential cross section for $^3\text{He} + \text{T} \rightarrow \text{d} + \alpha$ process. Furthermore the understanding of the mechanism of the same process could help in solving so called neutrino puzzle in astrophysics ²⁾. Finally the break up into three particles in the final state could yield some information of various final state interactions of these few nucleon systems.

So far we have preliminary investigated only the $^3\text{He} + \text{T} \rightarrow \text{d} + \alpha$ two body reaction using the double ionized $^3\text{He}^{++}$ beam of 350 keV bombarding energy obtained by 300 kV Cockcroft-Walton accelerator at the Institute "Rudjer Bošković" in Zagreb. The spectra have been measured detecting alphas and deuterons simultaneously to cover the angular range in c.m. from 25° to 165° degrees. The measured angular distribution of the relative differential cross section shows a certain asymmetry which is not consistent with the isospin conservation. Our results well agrees with one old measurement from 1953³⁾ at 360 keV. However, this is only a preliminary report and it is too early for any definite conclusions. Only a systematic study of this reaction which we intend to do in the ^3He bombarding energy range from 100-600 keV, can give better insight in this problem.

1) S. Barshay and G.M. Temmer, Phys.Rev.Letters 12 (1964) 728

2) M.R. Dwarakanath and H.Winkler, Phys.,Rev. C4 (1971) 1532

3) C.D. Moak, Phys. Rev. 92 (1953) 383