FRAGMENTATION OF THE $^7Li+^3He$ SYSTEM AT $E_{^3He}$=42.9 MeV

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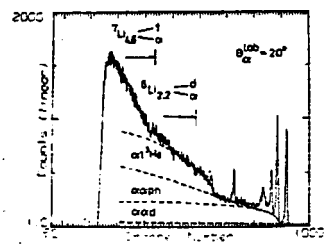
Receantly it has been shown[1,2] that a considerable part of the continuous inclusive particle spectra produced by fragmentation of light nuclei can be satisfactorily fitted by a combination of n-body phase spaces. This part has been attributed to the reaction mechanism in which a statistical partition of the energy in the composite system takes place. So far the data on that mechanism are scarce. The present study of the fragmentation of the $^7Li+^3He$ system was aimed to cast more light on the nature of this proces.

The inclusive α particle spectra (θ_α^{lab}= 10° to 70°) have been obtained by bombarding a highly enriched ^7Li target with a beam of ^3He particles ($E_{^3He}$= 42.9 MeV) of the University of Colorado cyclotron. By fitting the experimental α spectrum at each angle with phase space distributions of different n-body breakup processes, the magnitudes of the contributing n-body final state components were extracted. A representative fit to the experimental spectrum at 20° is shown on the figure. The present results are compared with those of the reaction $^9Be(p,\alpha)^2$) (the energy of the composite system beeing almost equal). It follows that the distinct contribution of the αt^3He final state in the present work (see figure) is not present in the $^9Be(p,\alpha)$ reaction, i.e. the reaction is not independent, but reflects the nature of the incident channel.



1. G.Paić et al, In Few Body Systems and Nuclear Forces (Springer Verlag, Lecture Notes in Physics 82) Vol.1, 1978, p.346.
2. T.Delbar, Thesis, Universite Catholique de Louvain, 1981.