1.5. Production of fact nuclei of A = 3 together with hypernuclei induced by 1.5 GeV/c K⁻ mesons on heavy nuclei*

Ž. TODOROVIĆ and M. JURIĆ, *Institute of Physics, Beograd*

In this work an analysis has been made of the production of helium nuclei and tritons of energy greater than 70 MeV in events with hypernuclei. The results of measurement of the helium nuclei show that the nuclei are predominantly ^{3}He. The energy spectra and angular distributions of ^{3}He nuclei and tritons are similar. The distributions of the total number of black and gray tracks (N_h) for events in which fast ^{3}He nuclei and tritons are emitted also are similar. These facts point out that the production mechanism of ^{3}He nuclei and tritons is the same. In events in which an $A = 3$ nucleus is emitted with energy higher than 200 MeV the number of detected cascade particles is lower than in events in which an $A = 3$ nucleus is emitted with an energy in the interval 70—200 MeV. This difference in the number of cascade particles is most likely due to different mechanisms of their production. In this work the production mechanisms of these nuclei are discussed. It is shown that fast nuclei of $A = 3$ most likely arise from the absorption of secondary π mesons and of the primary K^- meson in ^{4}He-clusters present in the outer regions of heavy nuclei.

1.6. $^8_2$He nuclei amongst hammer fragments in the interaction of K⁻ mesons with emulsion nuclei

S. POPOV and M. JURIĆ, *Institute of Physics, Beograd*

An investigation has been carried out on fragments of a charge $Z = 2,3$ and 5 with the characteristic decay into two alpha particles and one electron, the so-called hammers in the interaction of 10.1 and 1.5 GeV/c K^- mesons and of K^- mesons at rest with emulsion nuclei.

Using the method of measuring track width and detecting 2 electrons, fragments have been found belonging to $^8_2$He. The yield production of these fragments is determined.

Theoretical investigations[1,2] concerned with determination of the stability limits of light nuclei point to the possibility of the existence of $^8_2$He nuclei formed during rapid disintegrations of the heavy nuclei and emitted together with the fragments of different masses and charges.

There are two modes of decay proposed for the $^8_2$He nucleus:

$$\text{I} \quad {}^8_2\text{He} \xrightarrow{\beta^-} {}^8_3\text{Li}\ (0.978;\ 1^+) \xrightarrow{\gamma} {}^8_3\text{Li} \xrightarrow{\beta^-} {}^8_4\text{Be}\ (2.9;\ 2^+) \rightarrow 2\,{}^4_2\text{He}$$

$$\text{II} \quad {}^8_2\text{He} \xrightarrow{\beta^-} {}^8_3\text{Li}\ (3.22;\ 1^+) \rightarrow {}^7_3\text{Li} + \text{n}.$$

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