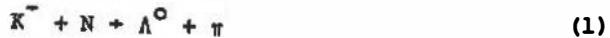


EMISSION OF MESONIC HYPERFRAGMENTS FROM K^- AND Σ^- CAPTURES ON LIGHT NUCLEI IN NUCLEAR EMULSION

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Absorption of a K^- meson in nuclear matter in about 60% of cases leads to the production of a Λ^0 hyperon, viz, directly by the following reactions:



or indirectly by the conversion of the Σ^- hyperon in the nucleus. The Λ^0 hyperon produced may form a hyperfragment. On the other hand, absorption of a Σ^- hyperon almost always leads to the production of a Λ^0 hyperon by the process



(the charge exchange reaction $\Sigma^- + p \rightarrow \Lambda^0 + n$ is rather unlikely).

Comparing the results of investigation of K^- and Σ^- interactions at rest in which hyperfragments are produced we notice some differences which may be due to different interaction modes. In spite of the higher probability of Λ^0 hyperon production by Σ^- capture it has experimentally been established that the emission of hyperfragments from these interactions is considerably less intense than in the case of K^- interactions (1) (2) (3).

In a work of S. Mora (1) a model of hyperfragment production by Σ^- capture has been described. According to this model the Λ^0 hyperon remains bound to the residual nucleus, forming thus a hyperfragment.

In this work a part of an Ilford K-5 nuclear emulsion stack of the European K^- (Terminus) Collaboration was used as the experimental material. An analysis was made of interactions of K^- mesons and Σ^- hyperons at rest with light nuclei of the emulsion leading to the formation of hyperfragments. The criterion for cap-

ture on a light nucleus in nuclear emulsion requires that the capture star contain a track of a length of 2-32 μm (4). Mesonic hyperfragments, which were emitted from a light nucleus of the emulsion and hence were certainly light, were identified by applying the Gajewski program (5) and according to a definite criterion (6).

458 hyperfragments from K^- interactions and only 13 hyperfragment from Σ^- interactions were identified. In order to increase the statistics for Σ^- interactions we combined our results with those reported by Frodesen et al. (7), so that we obtained all together 22 hyperfragments from Σ^- captures. The results are summarized in Table 1. The ratio $z \geq 3/z \leq 2$ for Σ^- captures exceeds that for K^- captures. This result might support the Nora's model (1) mentioned above.

Table 1

Identified hyperfragments with	$z \leq 2$	$z \geq 3$	$z \geq 3/z \leq 2$
From K^- absorptions	395	63	0.159 \pm 0.028
From Σ^- absorptions	14	8	0.571 \pm 0.354

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