completely. Therefore at the present time we can only speak of the possible observation of He^8 nuclei.

If such nuclei are actually formed in the process of fragmentation, further confirmation of their existence can be obtained through investigation of the T-shaped tracks in an emulsion sensitive to particles with minimal ionization, by successfully establishing the emission of two decay electrons at the stopping point.

We take the occasion to express our gratitude to Professor N. A. Perfilov for discussion of the results.

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A NOTE CONCERNING π-Λ RESONANCE

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Submitted to JETP editor February 7, 1961

J. Exptl. Theoret. Phys. (U.S.S.R.) **40**, 1520-1522 (May, 1961)

IT is well known that a connection exists between the possible resonances of the pion-hyperon system and the scattering amplitude. In particular, in the phenomenological analysis of the data on the K^--proton interaction[1] one finds that if one assumes that only the S state is involved and that the real part of the K^--p scattering amplitude is negative, there exists in the nonphysical region a singularity that corresponds to a pion-hyperon resonance.

In the recently published papers by Tuan[2] and by Ross and Shaw[3] the experimentally observed Λ-π resonance was identified with the above resonance. However, the investigations of the interference between Coulomb and nuclear scattering seem to indicate that this interference is constructive.[5] But in that case there should be no resonances in the pion-hyperon system which would correspond to a K^--p interaction in an S state.* Since the K^- meson is supposedly a pseudoscalar particle[6] the orbital angular momenta on both sides of the reaction

$$K^- + p \rightarrow \Lambda + \pi^0 \qquad (1)$$

have to be the same.

From this it follows that the observed Λ-π resonance should not be related to an S state. Since the momentum of the particles in the center-of-mass system at resonance is ~ 200 Mev/c, it is natural to assume that it cannot be due to D waves. This way it follows that if the foregoing propositions are true then the observed π-Λ resonance has to be in a P state.†

This conclusion is supported by the circumstance that in the K^--p reaction the yield of Λ hyperons is small compared to that of Σ hyperons for K^- capture at rest, while it increases rapidly at momenta of 300 to 400 Mev/c where P waves become important.‡

A strong resonance of the π-Λ system in a P state indicates an analogy with the $(3/2, 3/2)$ resonance of the π-N system.

At present there exist published data on the different channels of the K^--p reaction for capture at rest and for the momenta 300, 400 and 1150 Mev/c. The ratio of the Λ to Σ yields at 1150 Mev/c is still larger than at 300 and 400 Mev/c. This can be an indication of either a continuous increase of the yield ratio in the considered energy interval** or of the chance that there is some resonance of the Λ-π system close to 1150 Mev/c. In this connection one can remark that if one would want to extend the analogy between the π-Λ and π-N systems and expect a second π-Λ resonance corresponding to the second $I = 3/2$ resonance of the π-N system as well as that c.m.s. momenta are close (which they are for the first resonance), then the second resonance of reaction (1) should lie close to a K^- momentum of 1.1 Bev/c in the laboratory system.

At present there do not exist direct experimental data on the cross section of reaction (1) at 1150 Mev/c. The existing data at this energy for the different hyperon production channels[7,4] are insufficient to perform the necessary analysis in isospin states. However, approximate calculations performed on their basis show that the cross section of reaction (1) at 1150 Mev/c seems to be larger than that of any reaction leading to the production of a Σ hyperon and a π meson.

The author expresses his gratitude to B. N. Valuev, V. I. Ogievetskii and L. B. Okun' for discussions.

*We consider here resonances connected with noticeable cross sections, of which the Λ-π resonance is one.

†Evidently, if the K meson were even the resonance would be in an S state.

‡The decay $Y^* \to \Sigma + \pi$ also has to take place. It is however considerably rarer than the $Y^* \to \Lambda + \pi$ decay, firstly, because of the smaller phase space (roughly by a factor 3) and, secondly, because it is not a pure isospin I = 1 state. In this connection we remark that $\Sigma\pi$ resonances can exist with I = 0 and 2.

**We note that qualitatively such a behavior of the Λ to Σ yield ratio could be expected if the Sakata model were valid: Σ hyperons, being composite particles, should dissociate at high energies to form Λ-hyperons.

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MAGNETIC PROPERTIES OF POLYCRYSTALLINE ALLOY OF Cu *WITH 22.8 ATOMIC PERCENT* Mn

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Submitted to JETP editor February 24, 1961

J. Exptl. Theoret. Phys. (U.S.S.R.) **40**, 1522-1523 (May, 1961)

THE magnetic properties of solid solutions of copper and manganese have been studied in a number of investigations.[1-6] Scheil and Wachtel[6] showed that among all the alloys of the copper-manganese system, the alloy with 22.5 atomic percent manganese content has the largest magnetic susceptibility, being antiferromagnetic in the disordered state and ferromagnetic in the ordered.

Because we considered these peculiarities of the magnetic properties of this alloy very significant, we decided to carry out a somewhat more detailed study of its physical properties in the disordered state. For this purpose an alloy containing, according to the results of a chemical analysis, 22.8 atomic % manganese was prepared by high-frequency melting in vacuum. The necessary specimens were cut from the ingot thus obtained and were subjected to a prolonged anneal and to subsequent quenching.

The results of measurement showed that the magnetic susceptibility of the alloy is independent of the field at magnetic fields up to 3000 oe and goes through a maximum at temperature 94° K; furthermore, in the range of fields mentioned the magneto-caloric effect has the negative sign. From this we concluded that the alloy Cu + 22.8 atomic % Mn is antiferromagnetic, with a Néel point near 94° K. However, this antiferromagnet, at temperatures below T_N and at external magnetic fields exceeding a certain critical or threshold value H_t, exhibits properties characteristic of ferromagnets: measurements of the magnetocaloric effect, which is positive, reveal the presence of spontaneous magnetization; and in fields above 10 000 oe the magnetization approaches saturation.

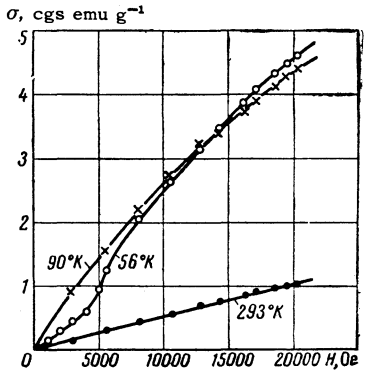

FIG. 1