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*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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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.

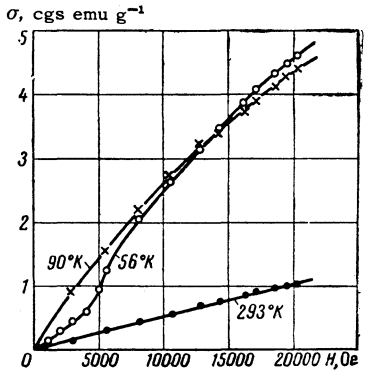

FIG. 1

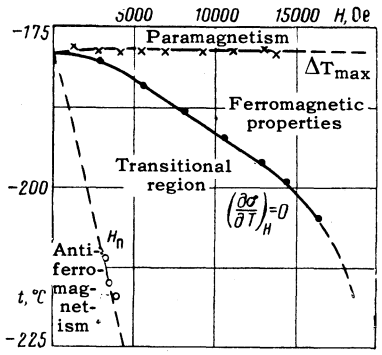

FIG. 2

The magnitude of the threshold field changes with change of temperature and, for example, is equal to 4000 oe at 56° K. Above 94° K, the alloy studied is paramagnetic and obeys the Curie-Weiss law at all values of the external magnetic field.

Figure 1 shows magnetization curves taken at temperatures below, near, and above the magnetic transformation point. Figure 2 gives, by way of graphic representation, an approximate diagram of the magnetic states of the alloy as they depend on the temperature and on the intensity of the external magnetic field. T_{max} corresponds to the temperature at which, in the given magnetic field, the magnetocaloric effect reaches a maximum.

It should be mentioned that the alloy we studied is similar in its magnetic properties to the intermetallic compound $MnAu_2$. It would be very valuable to study the magnetic structure of this alloy by neutron diffraction and to compare it with the magnetic structure of $MnAu_2$, which consists of a complicated spiral distribution of magnetic moments.[6]

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A SEARCH FOR NEAR-THRESHOLD ANOMALIES IN THE ENERGY DEPENDENCE OF THE TOTAL CROSS SECTION FOR INTERACTION OF PROTONS

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As has been shown by Wigner and by Baz',[1] the energy dependence of the cross section for the elastic scattering of two particles can have an anomalous character near the threshold for the production of a new particle. The shape of such an anomaly is a narrow "peak" or "step"; the anomaly is associated with a sharp change of the derivative of the cross section at threshold point. Near-threshold anomalies can also occur in the energy dependence of the total cross section for the interaction of two particles (for more details see the review article by Fonda[2]).

We have made a search for these anomalies in the neighborhood of the thresholds for the production of π-meson pairs in proton collisions (580 — 600 Mev). Studies of the energy dependence of the total cross section σ for the interaction of protons were also made in regions above and below the thresholds. Observations of anomalies in such cases could be an indication of the existence of new particles[3] and could make it possible to determine their masses.

A differential ionization chamber was used for the registration of the protons. This made it possible to achieve an accuracy in determining the relative shape of the energy dependence of the cross section which is an order of magnitude better than the accuracy characteristic of earlier experiments,[4] in which particle counters were used to measure σ.

The proton beam brought out from the chamber of the six-meter synchrocyclotron of the Joint In-