cluded.

One can detect a metastable state by measurements of "delayed" $\beta-\gamma$ and $\beta-\alpha$ coincidences. The usual method for such measurements was employed. The impulses of a β-counter were fed to the coincidence circuit with a time delay t_d which could be adjusted from zero to a few thousand microseconds. Recording of "delayed" $\beta-\gamma$ coincidences were carried out without a selection in energies of the β- and γ-radiation. In these measurements, no metastable state was detected with half-life within the range 0.5 to 400 μ secs.

In registering "delayed" $\beta-\alpha$ coincidences, an aluminum filter was placed between the source and the β-counters. The thickness of the filter corresponded to the absorption of all the β-particles which give coincidences with γ-quanta, i.e., β-particles pertaining to the highest energy β-transition were registered. An exponential dependence of the number of $\beta-\alpha$ coincidences on t_d was obtained, corresponding to the α-decay of RaC′. It is obvious that this result excludes the possibility of the existence of a metastable state with long lifetime, preceding the α-decay.

Thus, comparison of the results from measurement of "delayed" β-γ and $\beta-\alpha$ coincidences allows one to assume that the β-transition with limiting energy 3.17 mev does not proceed to an isomeric level. The data obtained are in agreement with the decay scheme proposed by Johanson[4] and confirms that the total energy of the β-transition equals 3.17 mev.

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Decay of a τ'-Meson

V. V. ALPERS* AND A. P. MISHAKOVA

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UPON further examination of a photographic emulsion[1] exposed in the stratosphere in May 1955, a particle was found to have stopped in the emulsion, decaying into a single positive pion which exhibited a typical picture of $\pi \to \mu \to e$-decay. The range of the μ-meson is $550\,\mu$. The track of the primary particle is inclined at a large angle to the emulsion, and that of the secondary particle (the pion) is parallel to the emulsion. This complicates an interpretation of the event which might still be considered as the scattering of a pion. Measurements were carried out on the grain density of several pion tracks inclined at the same angle and going in the same direction as the primary particle. Comparison of the grain densities of these tracks with the density of the track under consideration indicated that the scattering of a pion is definitely excluded. This must therefore be a particle decay event.

The path of the pion measures $600\,\mu$ and its energy is $E = 4.6$ mev; this excludes the decay of a K-particle according to the scheme $K \to \pi + \pi^0 + Q$. The event may therefore be interpreted as the decay of a τ-meson according to an alternative decay scheme into one positive and two neutral π-mesons ($\tau' \to \pi^+ + 2\pi^0$)[2-4]. Upon retracting the τ-meson trajectory, it was found that the meson had entered the emulsion having been created outside, and covered a distance of 3.76 cm in the emulsion. It is difficult to determine the τ'-meson mass exactly because its track makes a large angle with the plane of the emulsion.

Grain density measurements were carried out for the given track and for the tracks of pions and protons lying at the same angle. Results of ionization measurements indicate that the mass of the particle in question is smaller than the mass of a proton but greater than that of a pion.

One may therefore conclude on the basis of ionization measurements that the particle might be a K-meson.

In conclusion, we should like to thank Prof. I. I. Gurevich for his expression of interest in this work.

* Deceased.

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Inelastic Scattering Cross Sections of Nuclei for 2.5 MEV Neutrons

V. I. STRIZHAK
Institute of Physics
Academy of Sciences, Ukrainian SSR
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IN this communication we present briefly the results of measurements of inelastic cross sections for 2.5 mev neutrons. These measurements were carried out in the Institute of Physics of the Academy of Sciences, Ukrainian SSR during 1951-1952.

Inelastic scattering cross sections for neutrons can be measured rather easily by attenuation methods, using radioactive threshold detectors. In such experiments, the shapes of the scatterer and detector must be chosen in such a way as to eliminate the effect of elastic scattering or else make possible the evaluation of this effect. The threshold of the detector should be high enough so that the inelastically scattered neutrons cannot activate it. These problems were solved in two ways. In one method, a spherical scatterer was surrounded by a thin wrapper of the detector such that all neutrons elastically scattered by the scatterer had a chance to pass through the detector and activate it. Since inelastically scattered neutrons lose a significant fraction of their energy and do not activate the detector the experiment gives the attenuation of the neutron beam as a result of inelastic scattering.

In the second method, the spherical threshold detector was surrounded by a wrapping of scatterer. Here the neutrons scattered elastically by the part of the scatterer between the source of neutrons and the detector and not impinging on the detector will be compensated (completely or partly) by neutrons elastically scattered into the detector by other parts of the scatterer. It follows that in this way also the decrease in activation of the detector due to inelastic scattering can be determined after establishing the amount of cancellation .

A detailed analysis showed that both methods of measurement are valid under the experimental conditions used.

The reaction $P^{31}(n, p)Si^{31}$ was used as a threshold detector. The effective threshold here is equal to ~2 mev; the half-life is about 170 min. The neutrons were obtained from the D(*d*, *n*)He reaction. A thick, heavy ice target was bombarded with 190 kev deuterons obtained from a low voltage accelerator constructed for this purpose.

The measurements were carried out in the following fashion. A detector with scatterer and a detector without a scatterer were placed symmetrically with respect to the target at an angle of 90° relative to the deuteron beam. The irradiations of the two detectors were carried out simultaneously. After the end of the irradiation the activity of the detectors was measured using counters.

TABLE. Inelastic Scattering Cross Sections for 2.5 mev Neutrons.

Scatterer	Cross section for inelastic scattering, in barns	Scatterer	Cross section for inelastic scattering, in barns
Na	0,53±0.26	Zn	1.88±0,15
Mg	0,77±0,25	Se	1.88±0,17
Al	0,96±0,17	Mo	1,9±0.3
P	0,7±0,2	Ag	2.1±0,2
S	0,54±0,21	Cd	2.2±0.2
Cl	0,6±0,3	Sn	2,2±0.2
Ca	0.4±0.2	Sb	1.9±0.2
Cr	1.4±0.3	Te	2.0±0,35
Fe	1.16±0.12	J	1,96±0,25
Co	1.40±0.11	Ba	1.6±1.0
Ni	0.83±0.12	W	2,6±0.25
Cu	1,58±0.15	Hg	2,6±0.3
		Pb	1.7±0.3
		Bi	0.7±0.3