measured peaks at energies of 18.5, 20.0, and 26.0 MeV, corresponding to the levels $T = 1/2$, $I = 1/2^+$; $T = 1/2$, $I = 3/2^+$; and $T = 3/2$, $I = 1/2^+$, respectively. However, the most intense transitions in the energy region 21–25 MeV occur to the excited nuclear states $T = 3/2$, $I = 3/2^+$ at energies 24.3 and 24.5 MeV, and for $T = 3/2$, $I = 1/2^+$, at 24.8 MeV, whereas the main peak obtained in our experiments is located at an energy of 23.5 MeV.

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RADIATION OF Pd^{100}

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An investigation of the radiation of the radioactive isotope Pd^{100} was made with the aid of a "ketron" type magnetic spectrometer, a scintillation gamma spectrometer (single and double), and a total-absorption gamma spectrometer. The Pd source was prepared by chemical separation from a silver target bombarded with 660-MeV protons.

Figure 1 shows the soft region of the Pd-fraction conversion-electron spectrum. A group of lines with an intensity that decreases with a half-life of 3.7 ± 0.3 days, is observed. The gamma transition energy and the relative intensities of the conversion lines are given in the table. The values obtained for K – L, L – M, and K – M show convincingly that the transitions occur in the Rh nucleus.

According to the literature data, Pd^{100} has a half-life of 4.0 days.[1] To interpret the observed activity, the accumulation and decay curve was plotted for the 2380 keV gamma line belonging to the Pd^{100}–Rh^{100} daughter isotope (Fig. 2). An analysis of the curve gave respective values of 20 hours and 3.7 days for the half-life. It is there-

Transition energies, energy differences K – L and K – M, and relative intensities of the conversion lines and γ transitions, and the results of the $\gamma\gamma$ coincidences

№	$h\nu$, keV	Observed lines	$K-L$, keV	$K-M$, keV	K/K_{84keV}	K/L	$J_\gamma/J_{\gamma 84keV}$	γ transitions coinciding with given $h\nu$, keV
1	32.4±0.2	K, L, M	L—M =2.84±0.05	—	—	—	1.5±0.5	—
2	41,9±0,5	K	—	—	—	—	1,5±0,6	—
3	51.7±0.5	K	—	—	—	—	—	—
4	74.4±0.4	K, L, M	20.0±0.2	22.8±0.2	52±8	8.4±0,8	45	84
5	83.8±0.4	K, L, M	19.9±0.2	22.8±0,2	100	9.0±0.9	100	32. 42. 74
6	126.5±0,5	K, L	19.6±0,2	—	1,6±0.3	—	10	32
7	158,1±0.5	K, L	—	—	—	—	1,3	None

Relative intensities $J\gamma/J\gamma_{84}$ keV are given with an error not more than 20%.

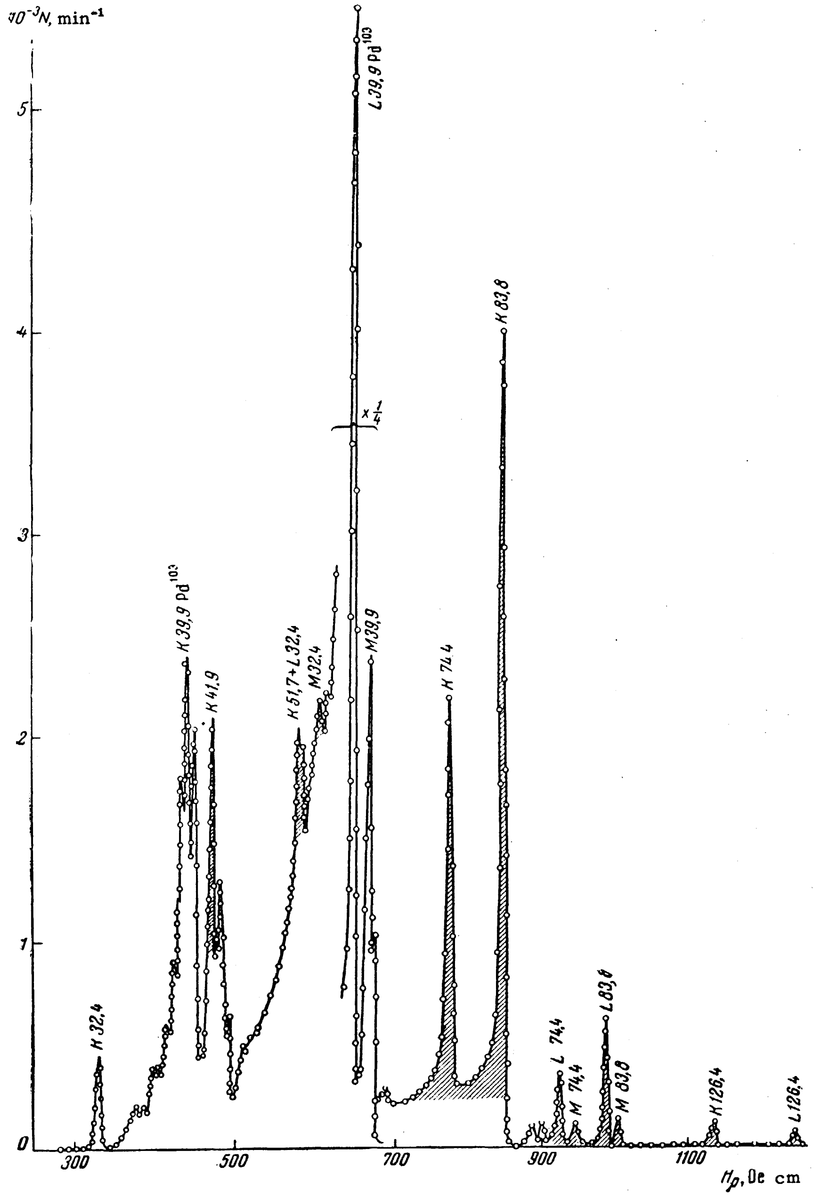

FIG. 1. Spectrum of conversion electrons of the Pd fraction from 8 to 130 keV. The lines belonging to Pd^{100} are shaded. The abscissas are the energies in Hρ, Oe-cm.

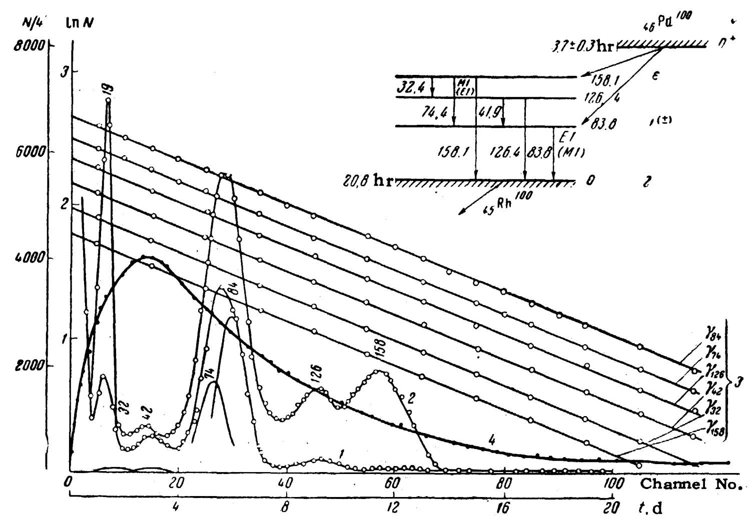

FIG. 2. Single gamma spectrum of Pd^{100}—curve 1; total absorption gamma spectrum of Pd^{100} gamma radiation—curve 2; decrease in gamma-line intensity with half life 3.7 ± 0.3 days—curves 3; accumulation and decay of intensity of gamma lines 2380 keV in Ra^{100}—curve 4; upper right—proposed decay scheme of Pd^{100}. Ordinates N/4' —number of counts in 4 minutes.

fore concluded that the observed activity with a half-life of 3.7 ± 0.3 days should be ascribed to Pd^{100}

The gamma spectrum of Pd^{100} is shown in Fig. 2. The relative intensities of the gamma transitions and the results of the investigation of the $\gamma\gamma$ coincidence spectra are listed in the table. The intensity of all the observed gamma lines decreased with $T_{1/2} = 3.7 \pm 0.3$ days. The total absorption spectrum of the Pd^{100} gamma radiation is shown also in Fig. 2. The sum lines with energies 158, 126, and 84 keV are clearly seen, in agreement with the data on the $\gamma\gamma$ coincidences of Pd^{100}.

From the aggregate of the obtained results we have deduced the decay scheme of Pd^{100}. This scheme contains all the gamma transitions observed by us except for the gamma transition with energy ~ 52 keV. The high values of the ratio K/L for the most intense 74.4- and 83.8-keV γ transitions show that these transitions can be of the type M1 or E1.

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STUDY OF THE (γ, p) REACTION IN CARBON

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ALTHOUGH a large number of investigations have been devoted to the study of the photodisintegration of carbon, at the present time considerable uncertainty still exists both as to the shape and as to the magnitude of the photodisintegration cross section. Calculations of the dipole levels of the carbon nucleus, carried out on the basis of the shell model by Vinh-Mau and Brown[1] and Nilsson et al[2] have shown that there should be a rather intense dipole level at an energy above 30 MeV. Up to the present time this level has not been observed experimentally. In this connection it has been of interest to carry out a study of the photodisintegration of carbon at energies above 30 MeV. In the present work we have studied the (γ, p) reaction on carbon by means of a cloud chamber in a magnetic field, operating in a bremsstrahlung beam with a maximum energy of 170 MeV.

The cross section of the (γ, p) reaction has been calculated on the assumption that the final nucleus B^{11} is left in its ground state. The energy of the proton was determined from its momentum, which in turn was found from the curvature of the track. The energy of the recoiling nucleus was determined by its range. The accuracy of the energy determinations was 6–7% for the

Yield of various reactions on carbon

Type of reaction	No. of events observed	Yield relative to total yield, %	Type of reaction	No. of events observed	Yield relative to total yield, %
(γ, p)	2207	42	(γ, 3α)	137	2.5
(γ, n)	1541	31	(γ, $2\alpha\alpha'n$)		
(γ, pn)	408	8	[$C^{12}(\gamma, nHe^3)2He^4$]	42	0.8
(γ,α')[$C^{12}(\gamma, He^3)Be^9$]	83	1.5	including	301	5.5
(γ, αn)	92	1.8	4-prong stars		
including	542	10	(γ, $3pn$)	32	0.6
3-prong stars			(γ, $2p2\alpha$)	99	1.8
(γ, $p\alpha$)	229	4.5	(γ, $2\alpha pt$)	141	2.7
(γ, $p\alpha n$)	52	1	5-prong stars	28	0.5
(γ, $2p$)	51	1	6-prong stars	5	0.1
(γ, $2pn$)	31	0.6			