a photon with energy more than 1 Mev is 3×10^{-4} per ordinary decay. The average photon energy per decay is 12 kev. It would be of interest to have an experimental determination of these quantities.

In the interaction (1) we have assumed that a π-meson interacts directly with a μ-meson. Of the alternative assumptions concerning the mechanism of the decay, that in which the mesons interact only through nucleons[12] might be of special interest and is under consideration.

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Internal Conversion in the *L*-Shell*

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In a previous paper,[1] the authors have given the results of calculations for the internal conversion of γ-radiation in the L_{I}-shell. The present communication contains a summary of these results together with the corresponding results for the L_{II}- and L_{III}-shells. The calculations reported here complete a program undertaken with the object of providing a table of internal conversion coefficients for the L-shell covering the range of γ-ray energies and atomic numbers employed by Reitz.[2]

All values given for the internal conversion coefficient are based on formulas derived from those obtained by Goertzel and Rose.[3] The method of derivation of those formulas has been reported earlier, together with a summary of the actual formulas for: the L_{I}-shell—electric dipole, electric quadrupole, and magnetic dipole; the L_{II}-shell—electric dipole; and the L_{III}-shell—electric dipole.

The additional modified formulas required for the present calculations are quite similar and we hope to publish them at a later date. It should be noted that these formulas take account of relativistic terms but not the effects of screening. It is expected that numerical values for internal conversion coefficients for the L-shell will be computed by a method which, like that of Reitz, allows for screening effects; at that time the present results should furnish a good estimate of the importance of screening effects for internal conversion in the L-shell.

Tables I, II, and III give values for the internal conversion coefficient in the electric dipole, the electric quadrupole, and the magnetic dipole cases, respectively. Values are shown for each of three atomic numbers and for three γ-ray energies. Except for the use of IBM machines in the calculation of the hypergeometric functions, all numerical work was done on Marchant and Friden desk calculating machines.

Table I. Internal conversion coefficients for electric dipole radiation (observed L_N-electrons/observed photons of energy k).

Atomic number Z	Gamma-ray energy k (mc^2 units)	L_{I} shell	L_{II} shell	L_{III} shell	L shell
92	0.09273	0.2372	0.2567	0.2856	0.7795
	0.2927	0.02097	0.009763	0.007779	0.03851
	0.6427	0.003916	0.001076	0.0006813	0.005673
84	0.0833	0.2910	0.2606	0.3544	0.9060
	0.2333	0.03011	0.01241	0.01185	0.05437
	0.5333	0.004569	0.001080	0.0008520	0.006501
49	0.0283	2.202	1.347	2.531	6.080
	0.2083	0.01520	0.001819	0.002605	0.01962
	0.4083	0.002440	0.0001763	0.0002468	0.002863

Table II. Internal conversion coefficients for electric quadrupole radiation (observed L_N-electrons/observed photons of energy k).

Atomic number Z	Gamma-ray energy k (mc^2 units)	L_{I} shell	L_{II} shell	L_{III} shell	L shell
92	0.09273	9.199	235.2	202.9	447.3
	0.2927	0.1548	1.239	0.7025	2.096
	0.6427	0.01694	0.04557	0.01660	0.07911
84	0.0833	5.300	195.4	195.9	396.6
	0.2333	0.1103	1.617	1.184	2.911
	0.5333	0.01546	0.04494	0.02219	0.08259
49	0.0283	5.787	1792.	3260.	5058.
	0.2083	0.1026	0.1059	0.1188	0.3273
	0.4083	0.01176	0.004734	0.005271	0.02176

Table III. Internal conversion coefficients for magnetic dipole radiation (observed L_N-electrons/observed photons of energy k).

Atomic number Z	Gamma-ray energy k (mc^2 units)	L_{I} shell	L_{II} shell	L_{III} shell	L shell
92	0.09273	43.98	4.244	0.06309	48.29
	0.2927	1.896	0.1758	0.002150	2.074
	0.6427	0.2079	0.02046	0.0003458	0.2287
84	0.0833	27.85	2.397	0.02979	30.28
	0.2333	1.381	0.1123	0.002503	1.496
	0.5333	0.1313	0.01071	0.0003588	0.1424
49	0.0283	19.22	1.299	0.05643	20.58
	0.2083	0.05396	0.001244	0.0004160	0.05562
	0.4083	0.007751	0.0001476	0.00007558	0.007974

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Fine Structure and Angular Correlation in Po^{210}*

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Polonium[210] is usually considered as a pure α-emitter, although the presence of a weak γ-radiation (energy 803 kev, intensity about 10^{-5} per α) is definitely established.[1,2] The low energy α-particles preceding these γ-rays have escaped observation despite repeated attempts to study the fine structure of Po.

By using a coincidence method we were able to detect the low energy α-group and to study its angular correlation relative to the γ-rays following it.

For the first part of our experiments a source of Po was immersed in a scintillating solution (terphenyl phenylcyclohexane) and the height of the scintillation pulses was studied with a differential pulse-height selector (Fig. 1, curve I). Then, a thick piece of stilbene was located near the α-source and used to detect the γ-rays in coincidence with the α-particles. A fast coincidence circuit[3] (3×10^{-9} sec resolving time) was used in order to minimize the random counting rate. The pulse-height distribution produced by α-particles in coincidence with γ-rays is shown in Fig. 1, curve II. The shift between the two curves of Fig. 1 is, within experimental error, in agreement with an energy difference of 0.8 Mev.