

LETTERS TO THE EDITOR

K/L_3 , M/L AND $(N + O + \dots) / M$ RATIOS FOR 239 keV $M1$

TRANSITION IN ^{212}Bi

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Received 21 November 1968

Hager and Seltzer¹⁾ and Pauli²⁾ have recently prepared the tables of internal conversion coefficients, which in the first published parts contain the results for the non-penetrating part only (Rose³⁾ approximation). Compared with Sliv and Band tables⁴⁾ based on surface current model the values for K/L_3 ratios in $M1$ transitions differ by 10%. Since the differences are larger than the errors which could be expected from measurements, it might be of interest to obtain the information from experiments.

We have measured the ratios for the 239 keV transition in ^{212}Bi , which is believed to be pure $M1$, as no $E2$ admixture has been detected.

The results are presented in Table 1 and compared with theoretical values in Table 2 obtained by interpolations from the tables. The error quoted represents the standard deviation of the mean value of several measurements. Our results close to those of Latyshew group^{5, 6)}, rather surprisingly show a better agreement with the non-penetrating model.

We have also measured the ratios of M/L to compare them with recent tables^{1, 2)} and $(N + O + \dots) / M$ to provide data for more precise total conversion coefficients. Our values of M/L ratios agree well with theoretical predictions.

Table 1

Experimental results

Ratio	E. M. Krisyouk <i>et al</i> ⁵⁾	V. D. Vorobyov <i>et al</i> ⁶⁾	H. Daniel and G. Lukos ⁷⁾	Present paper
K/L_3	878	1007	—	910 ± 21
M/L	0.240	0.238	0.247 ± 0.011	0.227 ± 0.003
$(N+O+\dots)M$	0.333	0.370	0.362 ± 0.047	0.30 ± 0.02

Table 2
Theoretical results

Ratio	M. E. Rose ³⁾	L. A. Sliv and T. M. Band ⁴⁾	H. C. Pauli ²⁾	R. S. Hager and E. C. Seltzer ¹⁾
K/L_3	900	814	892	886
M/L	—	—	0.227	0.284

- 1) R. S. Hager and E. C. Seltzer, Internal Conversion Tables, California Institute of Technology, Pasadena, California, USA (1967);
- 2) H. C. Pauli, Tables of Internal Conversion Coefficients of the K, L and M Shell for heavy Nuclei (Basel) 1967;
- 3) M. E. Rose, Internal Conversion Coefficients, North-Holland Publishing Co., Amsterdam (1958);
- 4) L. A. Sliv and I. M. Band, Tables of Internal Conversion in Alpha, Beta and Gamma Ray Spectroscopy, edited by K. Siegbahn, North-Holland Publishing Company, Amsterdam (1965);
- 5) E. M. Krisyouk, A. G. Sergeev, G. D. Latyshev and V. D. Vorobyov, Nucl. Phys. 4 (1957) 579;
- 6) V. D. Vorobyov, K. I. Illin, I. I. Kollchinskaya, G. D. Latyshev, A. G. Sergeev, I. N. Trofimov and U. I. Fadeyev, Izv. Akad. Nauk SSSR, ser. phys. 21 (1957) 954;
- 7) H. Daniel and G. Luhrs, Z. Phys. 176 (1963) 30.