

E8 $2^+ - 2^+$ Transition of 693 keV in ^{154}Gd

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E9 The Multipolarity Mixture of the 793 keV $2^+ - 2^+$ Transition in ^{184}W

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E10 Measurement of the Internal Conversion K/L_3 , M/L and $(N+O+\dots)/M$ Ratios for $E2$ Transitions

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Internal conversion ratios $L_1/L_2/L_3$ were measured for 8 transitions, and K/L_3 , M/L and $(N+O+\dots)/M$ for 12 transitions of the pure $E2$ type in nuclei with charge $Z=56-80$ in the energy interval 80–500 keV. The measurements were made with a 50 cm radius iron-free double-focussing spectrometer.

The preliminary measurements of $L_1/L_2/L_3$ indicated that L_1/L_2 and L_1/L_3 ratios were larger than the theoretically predicted ones, while L_2/L_3 agree with theory. In the most recent and very precise measurements the experimental ratios were found to be 5–8% larger than theoretical.

One could expect that any effect in $L_1/L_2/L_3$ ratios due to $s_{1/2}$ — electrons would also show up in K/L_3 ratios.

There are five different tables of internal conversion coefficients (see ref.¹⁾). The calculations differ in treatment of (i) the screening of the atomic electrons, and (ii) the effect of the nucleus.

For the range of energies and atomic numbers covered in our experiments, the recent calculations of Pauli, Hager-Seltzer and Bhalla agree with Sliv and Banc's tables within 3%.

Comparison of experimental and theoretical data lead to the following conclusions:

1) In the interval of energies and mass numbers covered, the experimental K/L_3 ratios for pure $E2$ transitions agree quite well with all the available theoretical results.

2) The K/L_3 ratio is sensitive to the multipole order and can be used as independent information for the determination of multipole mixture ratios.