

"HIDDEN EFFECTS" IN INTERNAL CONVERSION PROCESSES

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The noncoherence of contributions of different multipolarities to an internal conversion process, combined with the hardly predictable penetration effects in the dipole conversion (predominantly), lead to the trivial mathematical non-uniqueness in the formation of a total internal conversion probability. Interesting physical arguments in certain cases may yield unexpected resolution of the ambiguity:

- 1) 208 keV transition in ^{237}Np : Conversion coefficient equals its no-penetration value, however, the penetration parameter is large^(1,2) ($\lambda \approx 50$ - "hidden penetration effect"). This value is suggested by the single-particle model⁽³⁾.
- 2) 191 keV transition in ^{197}Au : Dipole conversion is retarded due to the great penetration effect and the full value of the conversion coefficient is reached with the 30 electrons⁽⁴⁾ ("hidden monopole conversion"). The great 30 conversion rate is requested by the single-particle models.
- 3) 340 keV transition in ^{233}U : Situation similar to that in gold⁽⁵⁾.

Extrapolation leads to the conclusion that penetration effects might play a more important role in internal conversion processes than it is nowadays commonly assumed.

References:

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