

Electron-Electron Decay of the 393-keV Isomeric State
in ^{113}In

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In an earlier experiment Sommer, Knauf and Klewe-Nebenius[⌘] set the limit for the ratio of the double-electron KK decay and single K-electron conversion of the 393-keV isomeric state in ^{113}In , $\text{KK}/\text{K} \leq 2 \cdot 10^{-5}$.

In the present experiment a similar arrangement of two liquid-nitrogen-cooled electron detectors was applied. However, the analysis of pulses from the detectors was made in a three-parameter pulse-height analyzer. Amplitudes of pulses from the detectors and the time difference were recorded. Energy resolution for the 364-keV K-conversion electrons was about 6 keV, and time resolution about 20ns.

The events due to KK and K(L+M+...) were identified by the conditions of simultaneity and constant energy sum of 334 and 360 keV, respectively. Energy resolution of the system was not sufficient to resolve KL from KM events. Thresholds of the discriminators were set at about 35 keV to avoid excessive coincidence rates due to simultaneous emission of K-conversion electrons and K X rays. K(L+M..) events are clearly seen when sharing of energy between the two electrons is such that one electron has low energy. As its energy rises the probability falls off sharply. The probability of KK emission is considerably smaller than of the K(L+M+...) emission.

[⌘]H. Sommer, K. Knauf, and H. Klewe-Nebenius, Z. Physik
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