

DOUBLE INTERNAL BREMSSTRAHLUNG IN THE L-ELECTRON CAPTURE
DECAY OF ^{37}Ar

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Double internal bremsstrahlung has been observed in the electron capture decay of ^{37}Ar ¹⁾. The energy distribution and angular correlation of photons emitted in this process have been measured ^{1,2)} and theoretical predictions were compared with experimental data ³⁾. For higher energy γ rays the agreement between the theoretical predictions and experimental data was found. For photons below ≈ 100 keV this process was not investigated.

In our experiment the energy distribution of the two photons has been investigated, using a three-parameter puls-height analysis system, at an angle of 90° between two photon propagation vectors. The average activity of ^{37}Ar source during the experiment was about 350 uCi. Photons were recorded in $1/2'' \times 2''$ and $2'' \times 2''$ NaI (Tl) detectors in the energy intervals of 7-181 keV and 35-773 keV, respectively. The total number of coincidences in this energy range, collected during 444 hours was 955 ± 91 . Counts corresponding to the constant energy in one of the detectors were summed and projected on the energy axis of this detector. The data were compared with theoretical predictions available for K-shell electrons only. The discrepancies between experimental and calculated data, found at low energies were attributed to the double internal bremsstrahlung accompanying L-shell electron capture.

References

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