CONVERSION COEFFICIENTS STUDY IN THE BETA DECAY OF ⁷²Kr

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Nuclear Structure

Measurement of the Gamow-Teller strength distributions as a function of the excitation energy in the daughter nucleus, and the comparison with theoretical calculations can, under certain conditions, provide us the shape of parent nucleus in the ground state. Theoretical calculations [1] lead to very different Gamow-Teller strength distributions for different deformations of the ground state of the parent nucleus (prolate-spherical-oblate) for nuclei in the region of strong deformation around N=36.

Measurements of beta decay of ⁷²Kr were performed at ISOLDE with a Total Absorption Gamma Spectrometer (TAgS) but the analysis of the data has revealed the need for further information. A minimum knowledge of the decay scheme of the corresponding nucleus is needed in order to unfold the data. In particular, it is interesting the presence of a long life isomeric state at 101 keV in the daughter ⁷²Br of unknown multipolarity.

In order to overcome this lack of information and be able to extract the Gamow-Teller distribution of the N=Z ⁷²Kr decay complementary measurements have been performed at the ISOLDE facility to measure the conversion coefficients of the low energy transitions in ⁷²Br level scheme and half-life of the isomeric state and multipolar character of 101 keV transition. In addition, the ground state feeding to ⁷²Br that will independently allow us determine the spin of ⁷²Br which seems to have not been clearly established.

[1] P.Sarriguren et al., Nucl. Phys., A658, 13(1999)