

Improved limits on $\beta^+\text{EC}$ and ECEC processes in ^{112}Sn

New limits on $\beta^+\text{EC}$ and ECEC processes in ^{112}Sn have been obtained using a 380 cm³ HPGe detector and an external source consisting of 100 g enriched tin (94.32% of ^{112}Sn). A limit with 90% C.L. on the ^{112}Sn half-life of $1.3 \cdot 10^{21}$ y for the ECEC(0v) transition to the 0+3 excited state in ^{112}Te (1871.0 keV) has been established. This transition is discussed in the context of a possible enhancement of the decay rate. The limits on other $\beta^+\text{EC}$ and ECEC processes in ^{112}Sn were obtained on the level of $(0.1\text{--}1.6) \cdot 10^{21}$ y at the 90% C.L. In addition, it has been demonstrated that, in the future larger-scale experiments, the sensitivity to the ECEC(0v) processes for ^{112}Sn can reach the order of 10^{26} y. Thus there is a chance of detecting the $\beta^+\text{EC}(2v)$ transition of ^{112}Sn to the ground state and ECEC(2v) transition to the 0+1 excited state.

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