

β -decay data requirements for reactor decay heat calculations: study of the possible source of the γ -ray discrepancy in reactor heat summation calculations

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The decay heat of fission products plays an important role in predictions of the heat up of nuclear fuel in reactors. The released energy is calculated as the summation of the activities of all fission products $P(t) = \sum E_i \lambda_i N_i(t)$, where E_i is the decay energy of nuclide i , λ_i is the decay constant of nuclide i and $N_i(t)$ is the number of nuclide i at cooling time t . Even though the reproduction of the measured decay heat has improved in recent years, there is still a long standing discrepancy in the $t \sim 1000s$ cooling time for some fuels. A possible explanation to this improper description has been found in the work of Yoshida *et al* [1], where it has been shown that the incomplete knowledge of the β -decay of some Tc isotopes can be the source of the systematic discrepancy.

Motivated by [1], we have recently measured the β -decay process of some Tc isotopes using a total absorption spectrometer at the IGISOL facility in Jyväskylä. The results of our measurements as well as the their consequences on summation calculations will be discussed.

[1] T. Yoshida, T. Tachibana, F. Storrer, K. Oyamatsu and J. Katakura, J. Nucl. Sci. Technol., 36 (1999) 135.

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