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TRIGGERING OF $^{178}\text{Hf}^{\text{m}2}$ BY PHOTOINDUCED ELECTRON TRANSITION

We considered the NEET (nuclear excitation by electron transition) as a possible triggering mechanism of the isomer $^{178}\text{Hf}^{\text{m}2}$ during ionization of the L_3 atomic shell by x-rays. This 16^+ isomer is assumed to be excited into an intermediate state 15^- by E1 electronic transition between M_5 and L_3 shells. Simple nonrelativistic formulas are derived for the NEET probability. The estimations show the probability to be less than the experimental data of [1] by one order of magnitude. The intermediate level is found to decay bypassing the isomeric level 16^+ , if the nucleus attributes a triaxial shape in the 15^- state and, besides, there exists a level 13^- shifted with respect to 15^- by 400 keV. We have shown also that the NEET cross section $\sigma_{\text{NEET}}(E)$ as a function of the energy of x-ray photons E , has to accept constant value above the L_3 photoionization threshold in contrast to narrow peak observed by [1].

Keywords: nuclear isomers, NEET, induced nuclear decay, x-rays, hafnium, nuclear spectra.