NUCLEAR EXCITATION BY ELECTRON TRANSITION

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S u m m a r y

A theory of the nuclear excitation by an electron transition (NEET) induced by x-rays is developed on the basis of the strict collision theory. All stages of the process are considered, including the formation of a hole in an inner electronic shell, its decay leading to the excitation of the nucleus, as well as the subsequent filling of the upper level vacancy and the deexcitation of the nucleus. The cross sections are calculated for NEET and the photoabsorption of x-rays near the absorption edge. The results agree with the data of Kishimoto *et al.* for NEET on ^{197}Au. In addition, we discuss the NEET mechanism of triggering of the 31-year isomer $^{178}\mathrm{Hf}^{m2}$ via an intermediate level induced by x-rays. We have shown that the 2% decay acceleration of this isomer declared by Collins *et al.* is realistic if the nucleus attributes a triaxial shape in the intermediate state, and there exists an additional rotational band with the 13^- level.