Accelerated Emission of Gamma Rays from the 31-yr Isomer of 178 Hf Induced by X-Ray Irradiation

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A sample of $6.3x10^{14}$ nuclei of the 4-quasiparticle isomer of ^{178}Hf having a half-life of 31-yr and excitation energy of 2.446 MeV was irradiated with x-ray pulses from a device typically used in dental medicine. It was operated at 15 mA to produce bremsstrahlung radiation with an end point energy set to be 70 or 90 keV. Spectra of the isomeric target were taken with a high purity Ge detector. Intensities of selected transitions in the normal decay cascade of the ^{178}Hf isomer were found to increase by about 4%. Such an accelerated decay is consistent with an integrated cross section of $1x10^{-21}$ cm^2 keV for the resonant absorption of x-rays to induce gamma decay.