Erratum

Erratum: Levels in $^{146, 147, 148}$Gd observed following the decay of their terbium parents including a new isotope, ^{146}Tb [Phys. Rev. C 9, 674 (1974)]

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In the above named study of terbium nuclides we reported on the decay of the 1.9-min ^{147}Tb($h_{11/2}$) high-spin isomer to levels in ^{147}Gd. A tentative level at 1778.9 keV was proposed because: (1) a 1778.9-keV γ ray had a half-life ~2 min, and (2) an extremely weak 381.2-keV γ ray appeared to have a similar half-life and its energy was such that it fit as a transition between the tentative 1778.9-keV level and one at 1397.7 keV. We are now investigating dysprosium isotopes with $A \leq 149$, produced in ^{12}C and ^{14}N bombardments of ^{142}Nd and ^{141}Pr, respectively. As before a capillary transport system is used to extract recoil products from a helium-gas-jet reaction chamber to a shielded area where γ-ray counting can be made. Data accumulated in these experiments show that the 1778.9-keV transition does not belong to the decay of 1.9-min ^{147}Tb and, therefore, the tentative level of the same energy does not exist in ^{147}Gd.

The conclusion is inescapable because the intensity of the 1778.9-keV γ ray with respect to those of the most intense ^{147}Tb γ rays, i.e., 1397.7 and 1797.8 keV was found to vary from experiment to experiment, depending on bombarding energy, the projectile used, the amount of target material, etc. Figure 1(a) illustrates this point; it shows the high-energy portion of a singles γ-ray spectrum measured when ^{141}Pr was bombarded with 142-MeV ^{14}N ions. Here the 1778.9-keV γ ray is about twice as intense as the 1797.8-keV γ ray. Previously the ratio of the two intensities had been measured to be ~0.14. Coincidence data were also obtained in this ^{14}N + ^{141}Pr experiment. Figures 1(b) and 1(c) show spectra [covering a similar energy range as in Fig. 1(a)] in coincidence with the

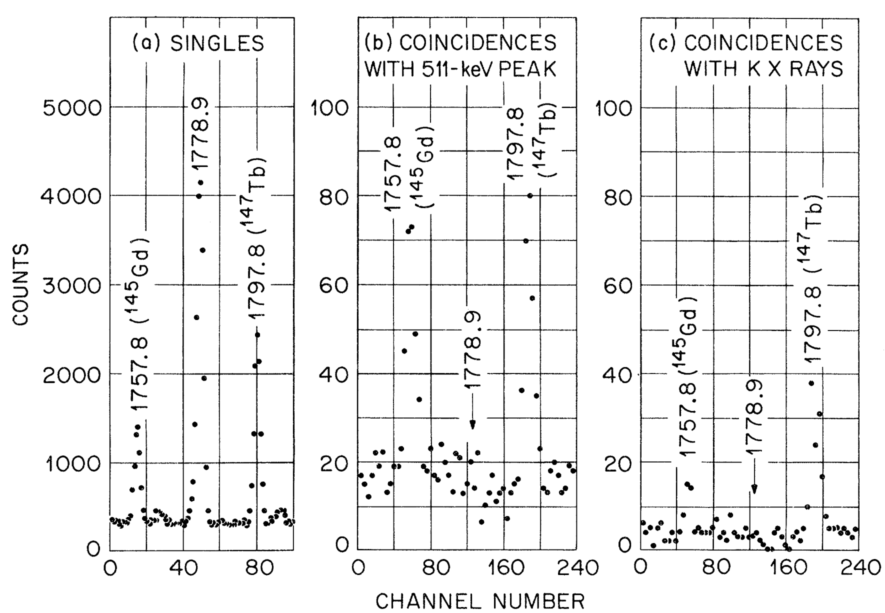

FIG. 1. Portions of γ-ray spectra measured when ^{141}Pr was bombarded with 142-MeV ^{14}N ions. Part (a) shows the singles spectrum; parts (b) and (c) show spectra observed in coincidence with annihilation radiation and with rare-earth K x rays, respectively. Arrows in parts (b) and (c) indicate the expected locations of the 1778.9-keV γ ray seen in the singles spectrum.

annihilation radiation peak and rare-earth K x rays. The ^{145}Gd and ^{147}Tb γ rays are seen, while the 1778.9-keV transition is absent. The evidence from these coincidence data is that the γ ray is associated with neither a highly neutron-deficient isotope nor a rare earth nuclide.

From a recent survey of known nuclides it appears that a candidate which fits both the transition's energy and half-life is ^{28}Al. The source of the ^{28}Al could be its production from the aluminum gas-jet reaction chamber by: (1) neutron capture on ^{27}Al, and/or (2) heavy-ion-induced single-neutron transfer on ^{27}Al.

In the original investigation three firm levels in ^{147}Gd were observed to be populated in the decay of the $h_{11/2}$ ^{147}Tb isomer. Two of these levels, 1397.7 and 1797.8 keV, were found to be fed strongly ($\log ft$ values $\lesssim 4.4$), prompting $\frac{9}{2}^-$ assignments for both states. The third level, at 997.6 keV, was populated weakly ($\log ft$ value ~5.9) even though an in-beam γ-ray investigation (Ref. 3) had assigned a $\frac{9}{2}^-$ spin to that state as well. This particular dilemma has now been resolved since a recent in-beam study [P. Kleinheinz, M. R. Maier, R. M. Diamond, F. S. Stephens, and R. K. Sheline, Phys. Letters 53B, 442 (1975)] has shown that the spin of the 997.6-keV level is $\frac{13}{2}^+$.

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