other than $E2$ may be excluded by the present data. The total internal pair coefficient (which is proportional to the area under a curve of counts/momentum) was found to be 4.0 percent greater than that predicted for $E2$ radiation. This is not felt to be as significant as the previous comparison because of the extra weight given the low-momentum points.

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Production of I^{124} by the Deuteron Bombardment of Tellurium

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We have observed a nuclear reaction not previously reported: the production of I^{124} by the deuteron bombardment of tellurium. The I^{124} was identified by decay and gamma-ray pulse-height studies using a well-type scintillation counter. We report also some observations on the relative amounts of the different iodine isotopes produced by the bombardment.

FOR those who are interested in the use of radioactive iodine isotopes, we would like to call attention to a means of producing I^{124}, which apparently has not been reported previously in the literature.[1] We have observed that substantial amounts of I^{124} are produced when ordinary tellurium is bombarded with the deuteron beam of a cyclotron, the reactions presumably being $Te^{124}(d,2n)$ and $Te^{123}(d,n)$.

In our work the tellurium was exposed to a beam of 20-Mev deuterons for 50-microampere hours. The I^{124} was identified by the study of its gamma-ray spectrum with a well-type (2-in. $\times$ $1\frac{5}{8}$-in. diameter) NaI scintillation crystal and a single-channel pulse-height analyzer. After five days (during which time the I^{130} component in the product decayed to an insignificant amount) the bulk of the gamma radiation, apart from the contribution from I^{131}, was observed to count in the pulse-height range between 0.50 and 0.75 Mev, while the main I^{124} gamma lines have been reported to be 0.60 and 0.73 Mev.[2] Scintillation pulses were observed in much weaker intensity up to about 2 Mev but not higher, which is consistent with the reported weak gamma rays of 1.7 and 1.95 Mev from I^{124}. Also, decay data taken between eight and thirty days after bombardment gave a half-life for the pulses between 0.75 and 1.4 Mev of 4.6 days, coinciding well with the reported I^{124} half-life of 4.5 days.[3]

In the deuteron bombardment of tellurium, iodine isotopes 124, 126, 130, and 131 are produced. No study was made of the relatively short-lived 130 component, but the relative amounts of the others were obtained from analysis of decay data taken between six and thirty days after bombardment. For I^{126}, whose gamma spectrum and counting efficiency in the crystal are quite similar to I^{131}, we found the activity (extrapolated back to bombardment time) to be 0.4 times the activity of the 131 component. For I^{124}, the counting efficiency in the crystal is quite different, but we estimate the I^{124} activity to be approximately twice the I^{131} activity immediately after bombardment.

The iodine was separated from the tellurium prior to the measurements by chemical procedures which should have precluded the presence of tellurium or any other elements. The fact that all the activity was from iodine isotopes was confirmed by a chemical reaction: When the active material was coupled to antibody protein, its degree of combination was the same as that of I^{131} in the sample.

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[1] The compilation of Hollander, Perlman, and Seaborg, Revs. Modern Phys. **25**, 469 (1953) lists three means of producing I^{124}: the spallation of tin, the alpha-particle bombardment of antimony, and the proton bombardment of tellurium.

[2] The values quoted for the radiations from I^{124} are taken from *Nuclear Data*, National Bureau of Standards Circular No. 499 (U. S. Government Printing Office, Washington, D. C., 1950).

[3] The decay data were taken in this pulse-height band, despite its exclusion of the main I^{124} lines, in order to avoid any counts from the 0.64-Mev gamma line of I^{131}. The observed pulses were from Compton scattering of the high-energy I^{124} gamma rays.