The agreement between these values and those of earlier investigations is good. The most probable means of the corresponding earlier Q-values are -1.28, 0.00, and 2.30 Mev. Furthermore, the lowest Q-value, -1.24 Mev, is in very good agreement with the highest Q-value of -1.27 Mev found by Brolley, Sampson, and Mitchell,[1] who used 22-Mev cyclotron α-particles.

For the boron reaction, we studied 200 tracks and found the Q-values -1.75, -0.55, -0.00, and 0.63 Mev.

The most reliable earlier investigation seems to be the second one of Creagan.[2] There is, however, a difference of about 0.63 Mev between his and our corresponding Q-values. If Creagan's Q-values are diminished by 0.21 Mev, we get the values shown in Fig. 3.

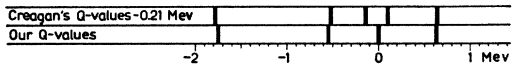

FIG. 3. Comparison between our Q-values for the B(α, p)C reaction and the corresponding Creagan values, reduced by 0.21 Mev.

Our 0.00-Mev group seems to be the unresolved mean of two of Creagan's groups. Apart from this, the agreement between the groups is good.

A further description of our investigations and a possible explanation of the discrepancy noted above will appear in *Arkiv för Fysik*.

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[2] R. J. Creagan, Phys. Rev. **76**, 1769 (1949).

Low Intensity Radiations in I^{131} Decay*

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IN a search for previously unobserved transitions in I^{131} decay an essentially weightless, electrically conducting, 10-mc source was prepared by electrodeposition of iodine onto a 0.02-mg/cm^2 evaporated silver film supported by a 0.02-mg/cm^2 Formvar film. This source was used in a thin magnetic lens spectrometer with an anthracene crystal scintillation spectrometer[1] as the detector. The data shown in curve A of Fig. 1 were taken with the thin lens spectrometer using the scintillation spectrometer to discriminate against scattered electrons with energies less than 350 kev. All points on this curve decayed with a 8-day half-life of I^{131} for a period of two weeks.

Kurie plots of the data corrected for instrument resolution[2] are shown in Fig. 2. The K-conversion line of the 364-kev gamma-ray was used as an internal standard for energy calibration. In addition to the main beta-group with a maximum energy of 606±4 kev this analysis indicates a low intensity beta-group with a maximum energy of 810±5 kev. This beta-group has been postulated[3,4] as a transition from the ground state in I^{131} to the 12-day metastable level in Xe^{131}. Since only a small region of the 810-kev beta-energy distribution could be measured, the relative intensity and the shape are uncertain. Assuming either an allowed or a first-forbidden shape, the 810-kev beta-transition occurs in somewhat less than 1 percent of the I^{131} disintegrations. This is in reasonable agreement with the fraction[5] of I^{131} atoms decaying to the 12-day metastable level of Xe^{131}, indicating that most of the transitions to this level are through the 810-kev beta-group.

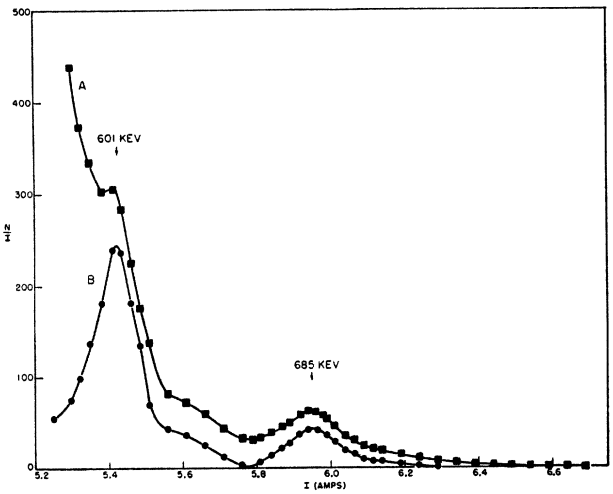

FIG. 1. Momentum distribution of I^{131} electrons at energies greater than 564-kev. (A) Original data. (B) After subtraction of beta-distributions.

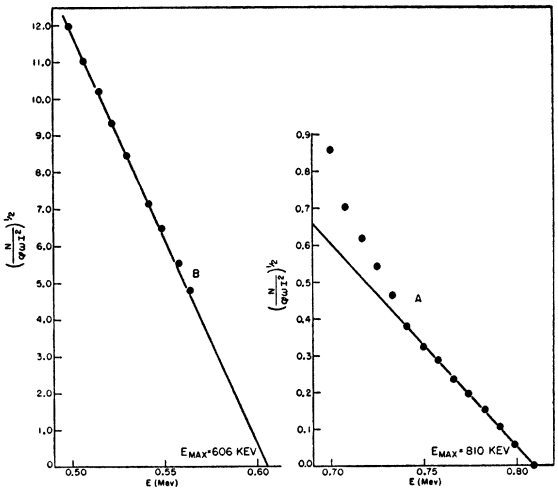

FIG. 2. Kurie plots of two I^{131} beta-groups.

Curve B in Fig. 1 shows the electron momentum distribution after subtraction of the two beta-groups. This curve shows the presence of conversion lines of 635±6-kev and 720±4-kev gamma-rays. The intensity of the 720-kev gamma-K conversion peak was found to be $\frac{1}{5}$ that of the 635-kev gamma-K conversion peak. The intensity of the 635-kev gamma-K conversion peak was 4×10^{-4} times the intensity of the 606-kev beta-group. A very rough measurement of the relative intensities of the unconverted gamma-rays with a Tl activated NaI scintillation spectrometer indicated that the K-conversion coefficients of the 635-kev and 720-kev gamma-rays were equal within a factor of two.

The 720-kev gamma-ray is probably a transition to the ground state from the 717-kev level[6] in Xe^{131}. The presence of this gamma-ray lends support to the value[7] of 250 kev for the end point of the low energy beta-group of I^{131}.

* This document is based on work performed for the Atomic Energy Commission at Oak Ridge National Laboratory.
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[2] G. E. Owen and H. Primakoff, Phys. Rev. **74**, 1406 (1948).
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[7] Kern, Mitchell, and Zaffarano, Phys. Rev. **76**, 94 (1949).

The High Energy Gamma Radiation† from Ta^{181}

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SINCE our earlier report[1] on the low energy gamma-emission of Ta^{181}, several investigations have been made of its high energy gamma-spectrum. These measurements have been made