Identification and decay characteristics of $^{132}I^m$ †

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The 83.6-min isomer of ^{132}I has been produced both by fission of uranium with medium-energy (30–85 MeV) protons and by the reaction $^{130}Te(\alpha, pn)^{132}I$, using tellurium enriched in mass 130. The isomeric transition is by a 98-keV γ ray (86%), the remainder decaying by β^- emission to levels in ^{132}Xe. Three new levels, viz. 2650.1 ± 0.9, 2829.1 ± 0.9, and 2960.1 ± 1.2 keV in ^{132}Xe have been found. A decay scheme for $^{132}I^m$ is presented.

[RADIOACTIVITY $^{132}I^m$; produced in medium-energy proton fission ^{238}U and reaction $^{130}Te(\alpha,pn)$, measured $T_{1/2}$, IT, ^{132}Xe deduced levels, decay scheme $^{132}I^m$.]

I. INTRODUCTION

Isomerism has been found in the following odd-odd isotopes of iodine: ^{130}I (9.2 min),[1,2] ^{134}I (3.56 min),[3–5] and ^{136}I (48, 83, and 100 sec).[6–8] $^{130}I^m$ was produced by the reaction $^{129}I(n,\gamma)^{130}I^m$. $^{134}I^m$ is not produced from the decay of its precursor, ^{134}Te (42 min), but has been produced independently in the thermal-neutron fission of uranium. No such isomer had been found for ^{132}I in thermal-neutron fission, since at these energies, Z_p, the most probable nuclear charge formed in fission, would be far[9] removed from that of ^{132}I and the independent yield of this nuclide would be very low. This is not true at higher energies since, with increasing bombarding energy, Z_p moves[10] towards Z_A, the most stable nuclear charge for mass A. The discovery and preliminary data about the decay of $^{132}I^m$, prepared initially in the bombardment of uranium with protons of energies 30–85 MeV and verified by the reaction $^{130}Te(\alpha,pn)$, have been briefly described previously.[11] The present paper describes the above work in detail and further work to characterize the decay of this isomer.

The decay of the 2.29-h ground state of ^{132}I has been extensively studied by many workers,[12–19] as has been the level structure in ^{132}Xe, produced by a variety of nuclear reactions,[20–24] and from the radioactive decay[25] of ^{132}Cs. In all of these investigations, where a source of ^{132}I had been used, this had been prepared from an equilibrated ^{132}Te-^{132}I source. No $^{132}I^m$ would have been present, since the expected high-spin $^{132}I^m$ would not have been produced in the decay of ^{132}Te.

II. EXPERIMENTAL PROCEDURES

A. Bombardments and preparation of sources

The sources of $^{132}I^m$ employed in this work were initially prepared by proton bombardments of natural uranium foils followed by radiochemical purification of iodine activities from the fission products. The internal circulating beam of the McGill synchrocyclotron was employed with protons ranging in energy between 30 and 85 MeV for various experiments.

Additional experiments were carried out with $^{132}I^m$ sources prepared from 26- and 46-MeV α-particle bombardments of enriched ^{130}Te (99.49%) with the Washington University, St. Louis, and Brookhaven National Laboratory cyclotrons, respectively, to produce the $^{130}Te(\alpha,pn)^{132}I$ reaction.

In the first set of experiments the uranium metal foil was dissolved in concentrated HCl (containing a few drops of concentrated HNO_3), 10–20-mg iodide carrier were added, the solution was made alkaline by addition of 2 M Na_2CO_3, the iodine was oxidized to periodate by 1-ml 5% NaOCl solution, and then reduced to the zero oxidation state with 1 M $NH_2OH \cdot HCl$ acid solution. The elementary iodine was extracted with CCl_4, reduced, and extracted into aqueous solution with a few drops of 1 M $NaHSO_3$ solution. The iodide was oxidized into CCl_4, reduced, and reextracted into water. The oxidation-reduction cycles were repeated several times until a γ spectrum showed only peaks which could be attributed to iodine isotopes or their xenon decay products. The sample was

finally precipitated as AgI for γ or γ-γ coincidence measurements.

In the second set of experiments $UO_2(NO_3)_2 \cdot 6H2O$ was irradiated under conditions similar to those described previously. No iodine carrier was added, since these samples were intended for x-ray measurements and it was desired to minimize the fluorescent x rays which would have been produced from the inactive iodine. The uranyl nitrate was dissolved in water, made 0.5 N with respect to HNO_3, and the iodine separated using heterogeneous exchange[26,27] on to AgBr.

In the third set of experiments, sources were prepared via the $^{130}Te(\alpha, pn)^{132}I$ reaction for β-γ or γ-γ coincidence measurements with less than 1-mg iodine carrier to minimize β^- absorption in the source. The source was wrapped in a thin (0.006 mm) Mylar foil.

In the fourth set of experiments sources were prepared via the (α, pn) reaction for measurement of conversion electrons by electrodeposition of iodine on a silver foil from a solution which contained 20-μg iodine carrier.

B. Detection equipment and methods of measurements

The γ- and x-ray spectra were obtained with 30- and 0.4-cm^3 Ge(Li) detectors, respectively, which fed into a 4096-channel pulse-height analyzer. The full width at half-maximum resolution of the two detectors was 2.8 and 0.500 keV, respectively, at 1.33 MeV and 122 keV. Several spectra were also taken with the Washington University Compton suppression spectrometer.[28] In these experiments a 45-cm^3 Ge(Li) detector (resolution 2.0 keV at 1.33 MeV) was used. The source was positioned about 30 cm from the detector which was well shielded with lead.

For the γ-γ coincidence measurements a 30-cm^3 Ge(Li) detector (resolution 3.1 keV at 1.33 MeV) was used with the 45-cm^3 detector mentioned above. The two detectors were placed at 120° to each other. In order to minimize "cross talk" the source was placed between two 5-mm Pb plates with a hole ~8-mm diam in the center. The resolving time of the instrument was 150 ns. Coincidence events were recorded on magnetic tape using the buffer tape capability of the 4096-channel pulse-height analyzer which was interfaced with a PDP-8/L on-line computer.

The x-γ and γ-low-energy γ coincidences were measured with Ge(Li)-Ge(Li), or Ge(Li)-Si(Li) combinations involving two Ge(Li) detectors of 30- and 0.4-cm^3 active volume, or a Ge(Li) and a Si(Li) detector of 45- and 0.030-cm^3 active volume with resolution of 3.0 and 0.5 keV at 1.33 MeV and 122 keV, or 2.0 and 0.17 keV at 1.33 MeV and 5.9 keV, respectively.

Conversion electrons were detected by a Si(Li) detector with 100-mm^2 active area and 500-μm depletion depth. *In vacuo* at liquid N_2 temperatures with 200 V of bias applied, this detector had a resolution of 4.0 keV at 100 keV. For β^--particle measurement a 5.1-cm × 2.6-cm plastic scin-

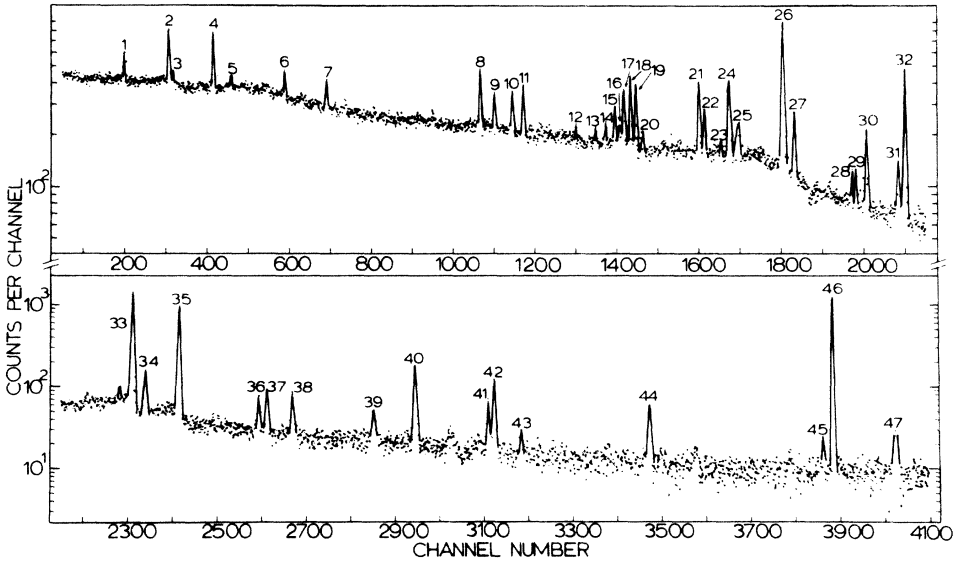

FIG. 1. γ-ray spectrum of purified iodine sample obtained from fission of uranium. The spectrum shown was obtained 18 min after chemical separation from tellurium precursors and 31 min after the end of irradiation. The energies are given in keV and the peaks labeled by 1, 2, 2M, and 3–6 are associated with the decay of iodine isotopes with mass numbers 131, 132, 132M, and 133–136, respectively. (See Table I for peak numbers and energies).

TABLE I. The peak numbers and energies for iodine isotopes shown in Fig. 1. The peaks labeled by 1, 2, 2M, and 3–6 are associated with the decay of iodine isotopes with mass numbers 131, 132, 132M, and 133–136, respectively.

Peak No.	Energy (keV)	Iodine isotope	Peak No.	Energy (keV)	Iodine isotope
1	98.1	2M	25	629.3	4+2
2	136.0	4	26	667.2	2+6
3	139.0	4	27	676.7	4
4	174.4	2M	28	727.0	2
5	187.8	4	29	729.9	4
6	235.0	4	30	738.7	6
7	272.0	4M	31	766.7	4+3
8	404.7	1+4	32	772.1	2
9	417.1	4	33	846.3	4
10	432.6	4	34	856.6	4+3
11	442.2	8	35	883.3	4
12	488.5	4	36	947.1	4
13	504.0	2	37	953.8	2
14	513.7	4	38	973.7	4
15	522.2	2	39	1035.0	2
16	526.0	5	40	1038.8	4
17	529.3	3	41	1071.8	4
18	535.5	6	42	1130.4	4
19	540.1	4	43	1135.5	2
20	545.8	2	44	1259.9	5
21	594.7	4	45	1398.2	2
22	599.5	2M	46	Pulser	
23	614.0	2M	47	1457.8	4
24	621.0	4+2			

tillator (Pilot B), coupled to a 5.1-cm photomultiplier tube was used.

C. Analysis of data

The area of each full-energy peak was calculated by subtracting a straight-line background from the total peak area. A third-degree polynomial function was used as an energy calibration curve. The decay curves were analyzed by the CLSQ computer code.[29]

The intensity of the β^- branching directly from the isomer will affect the shape of the decay curves, the full-energy peaks (FEP) having contributions both from the decay of the isomer and the ground state. The contribution of the two components to a FEP is given by

$$A_t = \left(A_g^0 + \frac{\lambda_g}{\lambda_m - \lambda_g} A_m^0 F\right) B_g e^{-\lambda_g t} + \left[(1-F)B_m - \frac{\lambda_g}{\lambda_m - \lambda_g} F B_g\right] A_m^0 e^{-\lambda_m t} , \quad (1)$$

where A_t is the activity at time t from any γ ray fed by both metastable and ground states; A_g^0 is the activity at $t=0$ from $^{132}I^g$ decay; A_m^0 is is the activity at $t=0$ from $^{132}I^m$ decay; λ_g, λ_m are the decay constants of $^{132}I^g$ and $^{132}I^m$, respectively; B_g is the fraction of $^{132}I^g$ decaying by this

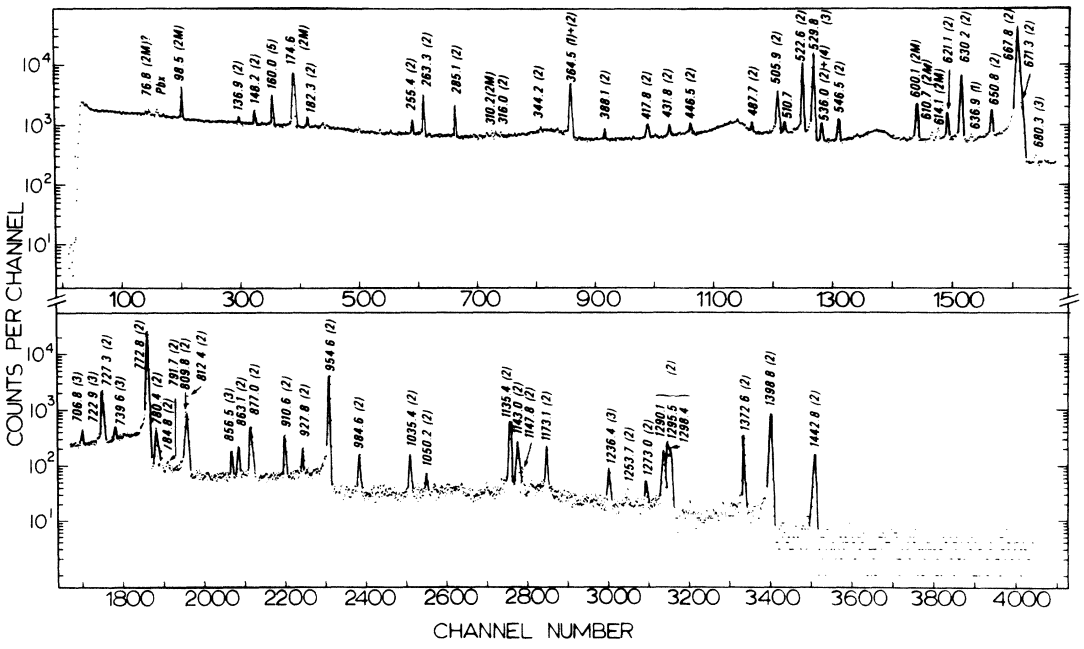

FIG. 2. Compton-suppressed γ-ray spectrum of ^{132}I produced by the reaction $^{130}Te(\alpha,pn)^{132}I$ with 26-MeV α particles. The peaks are labeled as in Fig. 1.

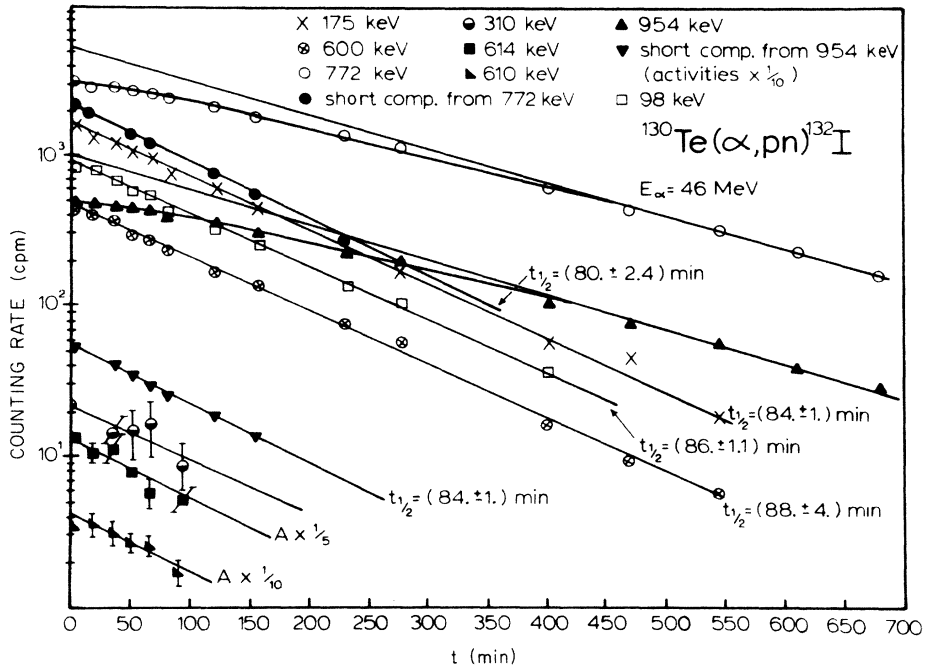

FIG. 3. Decay curves of 98-, 175-, and 600-keV γ rays produced in the reaction $^{130}Te(\alpha,pn)^{132}I^m$ by 46-MeV α particles. In addition decay curves of the 773- and 954-keV γ rays from levels fed by both $^{132}I^m$ and $^{132}I^g$ are shown.

particular γ ray; B_m is the fraction of $^{132}I^m$ decaying by this particular γ ray; and F is the fraction of $^{132}I^m$ decaying by isomeric transition (IT).

III. RESULTS

In Fig. 1 is shown a typical γ-ray spectrum (taken 31 min after the end of the irradiation and 18 min after chemical separation) of a purified iodine sample obtained from the fission of uranium The peaks are all attributable to isotopes of iodine ranging in mass from ^{128}I to ^{135}I and are so identified in the diagram. From such spectra the following γ rays, 98.0 ± 1.0, 175.0 ± 0.5, and 599.8 ± 0.4 keV were found to decay with a half-life of average value of 84 min and have been assigned to the decay of $^{132}I^m$. Additional γ rays at 310.0 ± 0.8, 610.0 ± 0.8, and 614.0 ± 0.8 keV, decaying with the same half-life were found from purified iodine samples obtained via the ^{130}Te-$(\alpha, pn)^{132}I$ reaction. In Fig. 2 is shown a typical Compton-suppressed spectrum obtained from samples prepared via the (α, pn) reaction.

The γ rays at 98.0, 175.0, and 599.8 keV were observed to decay simply with an average 84-min half-life as shown in Fig. 3. Evidence that $^{132}I^m$ undergoes β^- decay in addition to isomeric transition is derived from the fact that γ rays at 147.2, 522.6, 621.0, 650.5, 667.7, 772.6, 954.6, and 1136.0 keV known from the decay of $^{132}I^g$ were

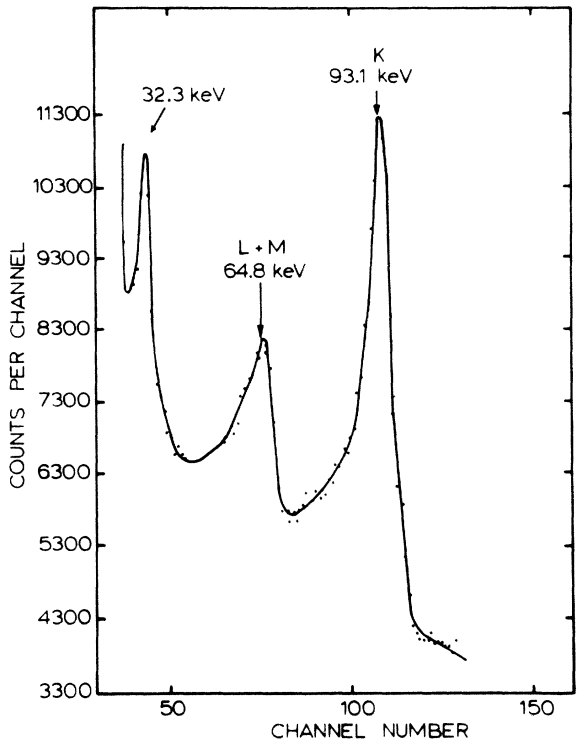

FIG. 4. Spectrum of the conversion electrons from the 98-keV isomeric transition. The 32.3-keV peak is due to iodine x ray.

observed in this work to exhibit decay curves with 84-min and 2.29-h half-periods. Examples of the resolution of such composite curves are shown in Fig. 3 for the 772.6- and 954.6-keV γ rays.

The 98.0-keV γ ray, decaying with a pure 86-min half-life, was found not to be in coincidence with any other γ ray, nor does it fit as a possible transition between any of the known[19] levels in ^{132}Xe, the closest in energy being 99.1 keV (3058.2 $\rightarrow$ 2959.1), and thus has been assigned to the isomeric transition. The multipolarity of this isomeric transition was deduced from measurements of the $\alpha_K/(\alpha_L+\alpha_M)$ ratio which for the 98.0-keV transition was found to be 0.45 ± 0.05, very close to 0.495 which is the theoretical value[30] for an $E3$ transition [for this transition energy Z, no other multipolarity has a value of $\alpha_K(\alpha_L+\alpha_M)<1$, except $E4=0.141$ which, in addition to being far removed from the experimentally deduced value, can be ruled out from lifetime arguments]. The low-energy portion of a conversion electron spectrum is shown in Fig. 4 where the K and $L+M$ lines from the 98.0-keV transition are seen.

Additional definitive evidence for the existence of an isomeric transition in iodine samples with an 84-min half-life is obtained from the decay of the iodine x rays recorded with a low-energy photon spectrometer. A typical spectrum of the x rays from an iodine sample from the ^{130}Te(α, pn) reaction is shown in Fig. 5. The decay of the characteristic iodine x rays from a sample of fissioned uranium exhibited components of $3.8m$, $9m$, and $86m$, attributed to ^{134}I^m, ^{130}I^m, and ^{132}I^m, respectively. The decay of the iodine x rays from the ^{130}Te(α, pn) reaction exhibited, as expected, only one component with a half-life between 82.6 and 86.0 min. The half-life obtained by x-ray measurements was usually slightly longer than that obtained by γ-ray measurements. This was shown in the following way to be due to fluorescent x rays obtained from inactive iodine impurities in the AgBr used in the heterogeneous exchange separations. Addition of small amounts of inactive carrier iodide (20 μg $\rightarrow$ 200 μg) to the AgBr showed an increasing half-life because of the small nondecaying background thus created.

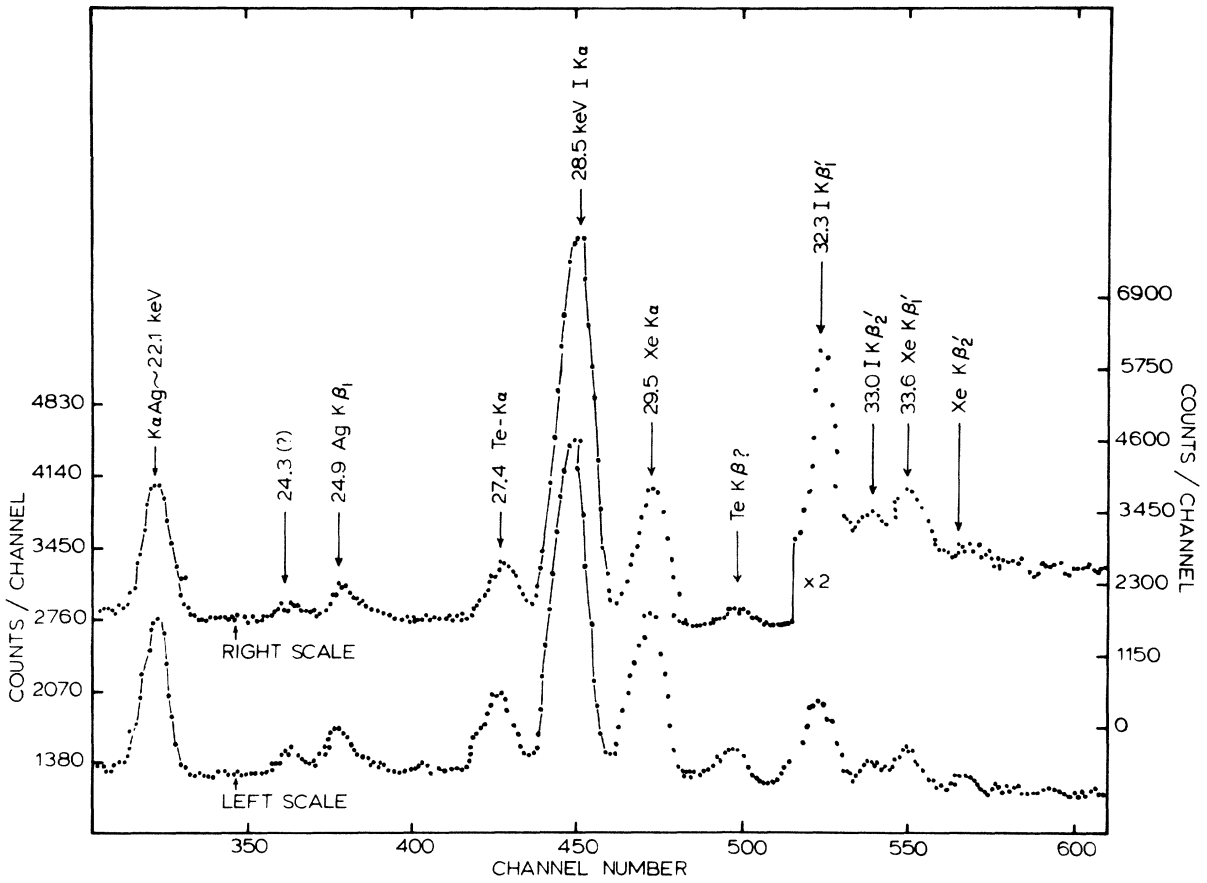

FIG. 5. X-ray spectra obtained from a purified iodine sample obtained from the reaction ^{130}Te$(\alpha,pn)^{132}$I produced by 26-MeV α particles.

TABLE II. Energy and intensity of the γ rays associated with the decay of $^{132}I^m$.

Measured γ-ray energy (keV)	Measured[a] γ-ray intensity	Transition[a,b] intensities (%)	Transition between levels (keV)
98.0 ± 1.0	28.8 ± 0.7	86 ± 2	Isomeric transition
175.0 ± 0.5	63 ± 4	10.4 ± 0.7	2215.1 → 2040.1
310.0 ± 0.8	4.6 ± 0.9	0.63 ± 0.12	2960.1 → 2650.1
599.8 ± 0.4	100 ± 5	13.2 ± 0.6	2040.1 → 1440.1
610.0 ± 0.8	10.5 ± 1.5	1.4 ± 0.2	2650.1 → 2040.1
614.0 ± 0.8	18 ± 5	2.4 ± 0.7	2829.1 → 2215.1

[a] Limits are for weighted averages ($\approx 3\delta$).

[b] Corrected for internal conversion; 175.0 γ, assumed $E2$ ($\alpha_T = 0.257$), and 310.0 γ, assumed $E2$ or $M1$ ($\alpha_T = 0.038$).

The value of F, the fraction of $^{132}I^m$ decaying by isomeric transition was calculated from Eq. (1) using the relative intensities of pairs of γ rays, such as 600, 668 keV, 600, 773 keV, 175, 668 keV, and 175, 773 keV, that involve one γ ray fed only by β decay of the isomer and one fed by the isomer via the ground state. The branching fractions B_m and B_g for these γ rays are known either from the decay[18] of $^{132}I^g$ or from the present decay scheme as discussed below. From this analysis the value of 0.86 ± 0.02 for the fraction of isomeric transition was obtained. In turn, from this information and the intensity of the observed 98-keV γ ray, an experimental value of 21.8 ± 1.4 for α_T, the total conversion coefficient for the 98-keV isomeric transition, was obtained. This is in excellent agreement with the theoretical value[30] of 22.3 for an $E3$ transition.

The best values for the half-lives of the isomers of iodine, obtained by CLSQ[29] analysis of the γ-ray data, are 8.9 ± 0.2 min, 83.6 ± 1.7 min, and 3.8 ± 0.1 min for $^{130}I^m$, $^{132}I^m$, and $^{134}I^m$, respectively.

The energies and intensities of the γ rays associated with the decay of $^{132}I^m$ are summarized in the first two columns of Table II and are reported relative to the 599.8-keV γ ray taken as 100.

The γ-γ coincidence relationships were established from a two-parameter experiment and are summarized in Table III.

The β-γ coincidence measurements have shown two groups of β particles in coincidence with 175- and 600-keV γ rays. The Fermi-Kurie plots are shown in Fig. 6, where E and ϵ are the kinetic energy of the electron and the total electron energy, respectively, in units of mc^2, η is the electron momentum in units of mc^2, and $f(z, \eta)$ is the Fermi function.[31] Analysis of the Fermi-Kurie plots gave the following maximum β^- energies: 1470 ± 10 and 840 ± 40 keV in coincidence with the 175-keV γ ray, and 1450 ± 30 and 730 ± 50 keV in coincidence with the 600-keV γ ray. The intensities (percentage of decay of $^{132}I^m$) of the β^- groups were calculated from the γ-ray intensities of Table II and are shown in Fig. 7.

TABLE III. Summary of the γ-γ coincidence relationships established in this work.

Gate on E_γ (keV)	γ rays observed in coincidence (keV)
98	None[a]
175	600, 614, 668, 773
600	175, 310, 610, 614, 668, 773
772	175, 523,[b] 600, 668, 727,[b] 955[b]

[a] No other γ ray or iodine K x rays were observed in coincidence with this γ ray.

[b] Known to be strongly fed in $^{132}I^g$ decay and to be in coincidence with both 668 and 772 γ rays; Ref. 19.

The Fermi-Kurie plots have been resolved into their components by use of a linear least-squares computer code, in which each point has been weighted with its error.

Finally, a separation of iodine from fission-produced tellurium showed only 2.3-h $^{132}I^g$ produced from the 77-h ^{132}Te.

IV. CONSTRUCTION OF THE DECAY SCHEME FOR $^{132}I^m$

The 98-keV γ ray has been shown to have a multipolarity of $E3$. The ground state of ^{132}I has[18] $J^\pi = 4^+$. In all probability J^π of $^{132}I^m$ is 8^-, analogous to $^{134}I^m$ and $^{134}Cs^m$. The transition $8^- \rightarrow 4^+$ is $M4$, not $E3$ and thus another state (probably 5^+) must exist as an intermediate in the deexcitation to the ground state, again analogous[4] to $^{134}I^m$. A search of iodine K x rays in coincidence with the 98-keV γ ray gave negative results and this establishes the possible 5^+ state below the K binding energy, i.e., < 32.9 ± 0.6 keV. This is consistent with the value of 120 keV for the energy of the isomer deduced from the present values for the end-point energies of the β groups, which give $Q_{\beta^-} = 3680 \pm 15$ keV for the decay of the isomer, and the value[15,32] of 3560 ± 15 keV for the decay of $^{132}I^g$.

A decay scheme incorporating all the information from the present work is shown in Fig. 7. Of the five γ rays at 175.0, 310.0, 599.8, 610.0, and 614.0 keV that result from the $^{132}I^m$ decay, the 599.8-keV γ ray is the most intense and it was observed in coincidence with the 667.7- and 772.6-keV γ rays. This confirms the level[20,21] at 2040.1 keV.

The 175.0-keV γ ray was observed in coincidence

with the 599.8- and 614.0-keV γ rays and since it is more intense than the 614.0-keV γ ray it must populate the 2040.1-keV level. This confirms levels[20,21] at 2215.1 and 2829.1 keV.

The 310.0- and 610.0-keV γ rays were observed in coincidence with the 599.8 keV, but not with the 175.0-keV γ ray. This would suggest the presence of two levels either at 2350.1 and 2650.1 keV or at 2650.1 and 2960.1 keV. (The 2350.67-keV level[19] decays differently from the possible level at 2350.1 keV considered here.) The two γ rays at 310.0 and 610.0 keV were too weak to be detected in coincidence with each other. The fact that the Fermi-Kurie plot of the β^- groups coincident with the 599.8-keV γ ray shows two end points at 1450 and 730 keV supports the latter alternative. Thus the assignment of two new levels at 2650.1 and 2960.1 keV is preferred, with the 310.0- and 610.0-keV γ rays placed in cascade.

On the basis of this decay scheme the percent populations of the levels in ^{132}Xe from the $^{132}I^m$ decay were obtained from the transition intensities of Table III. Values of logft were computed from the β^--group energies and intensities given in Fig. 7 using the tables of Ref. 33. Allowed β^- transitions were assumed to all levels except to the 2040.1-keV level, for which a second-forbidden unique character was assumed, but a correction for a first-forbidden unique shape was included in the calculation of the quoted ft value. The logft values obtained are listed in Fig. 7. The β^--group energies in Fig. 7 are based on the value of Q_β- = 3680 ± 15 keV obtained in this work, and the level energies are established from the γ-ray energies.

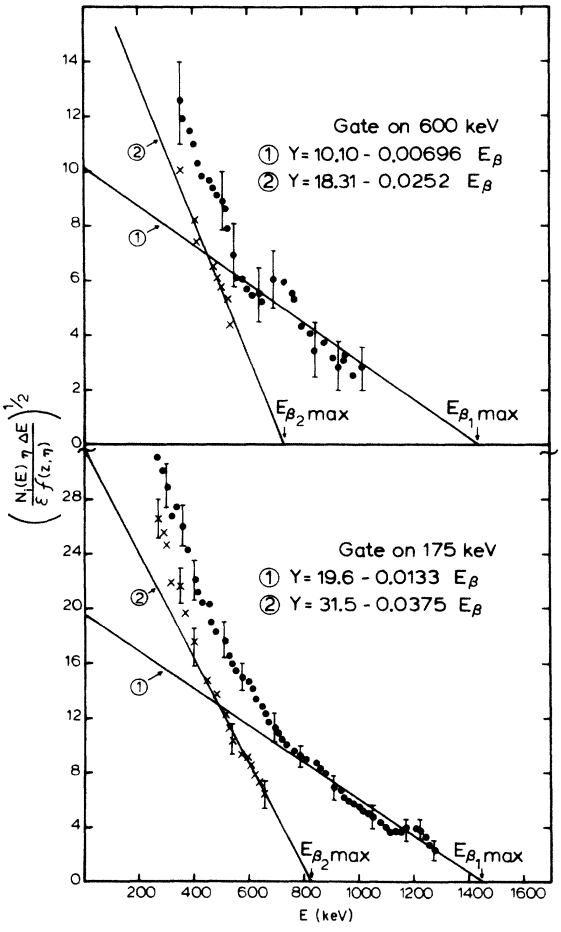

FIG. 6. Fermi-Kurie plots of electrons in coincidence with 175- and 600-keV γ rays.

V. ASSIGNMENT OF J^π VALUES AND DISCUSSION

The levels at 2040.1 and 2215.1 keV in ^{132}Xe have been well characterized as 5^- and 7^- from the in-beam ^{130}Te(α, $2n\gamma$) spectroscopic studies.[20,21,34] The strong β^- branch to the (7^-) 2215.1-keV level and the lack of decay to the (5^-) 2040.1-keV level is consistent with the J^π of 8^- for $^{132}I^m$. The logft values of 7.0, 7.4, 6.6, and 6.9 for the 2215.1-, 2650.1-, 2829.1-, and 2960.1-keV levels are consistent with allowed transitions in this region. Since the 2650.1-keV level was observed in this work to decay exclusively to the 5^- level at 2040.1 keV, its J^π value can be limited to 7^-. Only broad limits of $(7, 8, 9)^-$ can be placed for the 2829.1- and 2960.1-keV levels. The 2050.1-

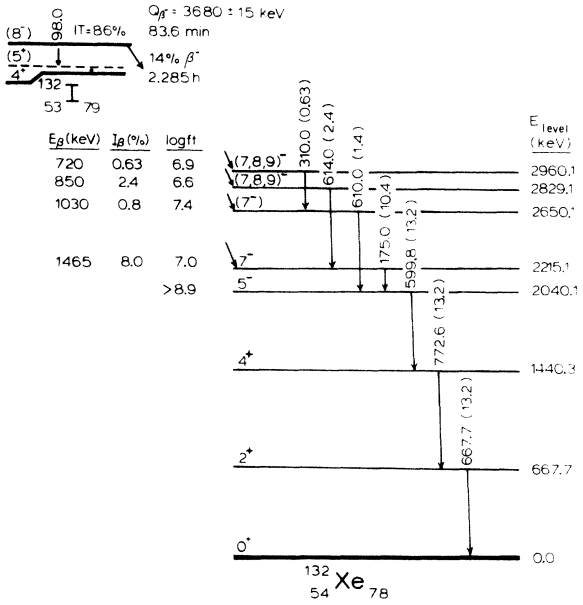

FIG. 7. Proposed scheme for the decay of 83.6-min $^{132}I^m$. The energies are given in keV and in parentheses the transition intensities are given for 100 decays of the $^{132}I^m$.

and 2829.1-keV levels have not been reported[36] to be populated in the $^{130}Te(\alpha, 2n\gamma)$ reaction studies,[20,21] although the 10^+ 8.4-ms 2752.8-keV state appears to be populated with reasonable cross section. In the singles spectrum shown in Fig. 1 of Ref. 34 two weak γ peaks are visible in approximately the energies of 610 and 614 keV. Furthermore, the unassigned γ ray at 312.5 keV could conceivably be the 310.0 ± 0.8-keV γ ray observed in this work. The angular correlation[34] for the 312.5-keV γ ray is consistent only with a dipole transition and this would be in agreement with the J^π assignments for the 2650.1- and 2960.1-keV levels as 7^- and $(7, 8, 9)^-$, respectively.

The configuration of the ground state ($J^\pi = 4^+$) of $^{132}I^g$ involves the coupling of the odd 53rd proton and a single neutron, similar to the configuration in $^{134}I^g$ and $^{134}Cs^g$. The $J^\pi = 4^+$ state could result from $(\pi g_{7/2} \nu d_{3/2})_4^+$, $(\pi d_{5/2} \nu d_{3/2})_4^+$, or $(\pi g_{7/2} \nu s_{1/2})_4^+$ coupling. The spin of ^{134}Cs, $J^\pi = 4^+$ arises from the coupling of a $g_{7/2}$ proton and a $d_{3/2}$ neutron with, in the case of the proton, a possible $d_{5/2}$ admixture.[35] The first excited state, $J^\pi = 5^+$, in ^{134}I[4] and ^{134}Cs[36] has a configuration $(\pi g_{7/2} \nu d_{3/2})_5^+$. The $J^\pi = 8^-$ isomer in these nuclei can be constructed either as a $(\pi g_{7/2} \nu h_{11/2})_8^-$ or $(\pi d_{5/2} \nu h_{11/2})_8^-$ state.

Since analogous 8^- isomers occur in $^{132}I^m$, $^{134}I^m$, and ^{134}Cs, it is of some interest to compare the $B(E3)$ values for these isomeric transitions. Using the expressions given by Skorka, Hertel, and Retz-Schmidt[37] for the single-proton estimates in Weisskopf units (W.u.), the $B(E3)$ values were found to be 2.1×10^{-4}, 7.5×10^{-5}, 5.3×10^{-5} W.u., for the IT in $^{132}I^m$, $^{134}I^m$, and ^{134}Cs, respectively. The theoretical values[30] for α_T of 21.6, 1.223, and 6.90, respectively, were used in these calculations. It is seen that $B(E3)$ for the IT in $^{132}I^m$ is 2.8 times larger than that in $^{134}I^m$. It has been suggested[4] that a small admixture of the $(\pi g_{7/2} \nu h_{11/2})_8^-$ configuration in the wave function for the 8^- state is indicated or required to account for the observed $B(E3)$ values. A similar situation is also applicable to the $^{132}I^m$ case.

It is interesting to note, as pointed out by Kerek *et al.*,[34] that the quasirotational band structure of the even Xe isotopes ceases to exist in ^{132}Xe. It was thus proposed[34] that the 7^- state in ^{132}Xe at 2215.1 keV has an $(\nu h_{11/2} \nu d_{3/2})_7^-$ neutron configuration. The observed $\log ft$ value of 7.0 for the decay of the 8^- isomer to this 7^- level is the same in the decay $^{134}I^m$ and it is not unusual for allowed transitions in this region.

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