¹³⁶Ιβ⁻ decay (83.4 s) 1977We04,1991Ma07

| | | History | |
|-----------------|-----------------|---------------------|------------------------|
| Туре | Author | Citation | Literature Cutoff Date |
| Full Evaluation | E. A. Mccutchan | NDS 152, 331 (2018) | 1-Apr-2018 |

Parent: ¹³⁶I: E=0.0; $J^{\pi}=(1^{-})$; $T_{1/2}=83.4$ s 4; $Q(\beta^{-})=6884$ 14; % β^{-} decay=100.0

1991Ma07: ¹³⁶I activity from ²³⁵U(n,F) with E=thermal followed by mass separation (TRISTAN). Measured $E\gamma$, $I\gamma$, Ece, Ice using a Ge detector and a Si(Li) detector; deduced conversion coefficients.

1977We04: ¹³⁶I activity from ²³⁵U(n,F) followed by mass separation at the TRISTAN on-line isotope separator facility at the Ames reserach reactor. Measured E γ , I γ , γ (t), $\gamma\gamma$ using two Ge(Li) detectors.

1980KeZQ: ¹³⁶I activity from ²³⁵U(n,F) with E=thermal followed by mass separation (LOHENGRIN). Measured E γ , E β , β - γ coincidences using plastic scintillator telescope and Ge(Li) detector; deduced β end point energies.

1959Jo37: U(n,F), chemistry. Measured γ 's and $\gamma\gamma$ (NaI) and β 's and $\beta\gamma$ (anthracene).

Others: 1982Al01, 1974Bu28.

Decay scheme is from 1977We04 with some modifications as proposed by 1979Pe02 (since 1583.5 γ and 597.8 γ have only a 83.4-s component and 2178.4 γ only a 46.6-s component, 1979Pe02 proposed that the 3873 level is a doublet). 1991Ma07 have introduced 0⁺ levels at 2582 and 3420 based upon observed E0 transitions. They also do not show feeding of 2608 level in g.s. decay. 1977We04 present a composite decay scheme; for clarity the data are presented here as three separate schemes, for 83.4-s, 46.6-s, and 83.4-s + 46.6-s decay. The latter tables and drawing contain those transitions which could not be classified as belonging to either the 83.4-s or the 46.6-s decay.

A total energy release of 6900 keV 110 as calculated by the code RADLST, is in good agreement with the total available energy of the decay of 6884 keV 14.

 α : Additional information 1.

¹³⁶Xe Levels

| E(level) [†] | $J^{\pi \ddagger}$ |
|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|
| 0.0 | 0^{+} | 2979.11 22 | $1^+, 2^+$ | 5016.99 21 | $(1,2^+)$ | 6103.9? 3 | 1- |
| 1313.028 10 | 2+ | 3211.90 20 | $(1,2^+)$ | 5217.8 4 | | 6114.5? 7 | 1 |
| 1694.387 12 | 4+ | 3275.22 13 | 3- | 5321.06? 24 | $(1^+, 2^+)$ | 6126.4? 5 | 1 |
| 2125.70 6 | 3+,4+ | 3873.13 14 | (3 ⁻) | 5608.1? 4 | 1 | 6169.9? 8 | $(1,2^{+})$ |
| 2289.53 8 | 2+ | 4269.33 9 | $2^{(+)}$ | 5760.2 <i>3</i> | | 6200.1? 13 | $(1,2^+)$ |
| 2414.74 11 | 2+ | 4320.1? 10 | 0^{+} | 5800.1? 3 | 1 | 6253.5? 8 | 1 |
| 2559.88 7 | (4^{+}) | 4454.07 16 | $1^{(-)}, 2^{(+)}$ | 5832.2? 6 | $(2^+, 3, 4^+)$ | 6409.0? 8 | $(1,2^{+})$ |
| 2582.4 10 | 0^{+} | 4474.05? 22 | 1 | 5870.8? 12 | 1 | 6624.07 18 | |
| 2634.16 7 | $1^+, 2^+$ | 4545.0 <i>3</i> | $1,2^{(+)}$ | 5968.5? 10 | $(1,2^+)$ | | |
| 2849.41 9 | $(1,2^+)$ | 4711.2 <i>4</i> | 1 | 6013.0? 10 | $(1,2^+)$ | | |
| 2869.00 10 | (2+) | 4947.5 <i>3</i> | | 6052.6? 4 | $(1,2^+)$ | | |

[†] From a least-squares fit to $E\gamma$, by evaluator.

[‡] From the Adopted Levels.

β^- radiations

No decomposition of singles spectrum into components possible due to presence of several strong \approx 5–MeV β 's in the decay of the two isomers (1980KeZQ).

<E β >=1.97 MeV 8 from 1982Al01 (OSIRIS; Si(Li),Ge(Li)) compares favorably with <E β >=1.96 MeV 6 from the decay scheme.

| Level | | $E\beta$ ($\beta\gamma$ coin)† | | |
|-------|----------|---|----------|--------|
| g.s. | 7000 100 | (1959Jo37), 6955 <i>120</i> | | |
| 1313 | 5620 150 | (singles), 5600 150 (1.32-MeV γ) (1959Jo37) | | |
| 2290 | 4735 180 | (977γ), 4635 <i>180</i> (2290γ) | | |
| 2634 | 4300 150 | (singles), 4230 200 (1.32-MeV γ) (1959Jo37); | 4240 210 | (345γ) |
| | 4305 180 | $(1313\gamma+1321\gamma)$, 4165 210 (2634 γ) | | |

† From 1980KeZQ, except as noted

| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | E(decay) | E(level) | Ιβ ^{-#} | Log ft | Comments |
|--|--------------------------------|----------|------------------------------|----------|---|
| $ \begin{array}{c} (475^{60} \ I A) & 6400.0^{\circ} & 0.045 \ I A & 5.66 \ I S & av E = 144.4 \ 50 \\ (631^{60} \ I A) & 6233.5^{\circ} & 0.033 \ I O & 6.21 \ I A & av E = 220.5 \ 53 \\ (648^{10} \ I A) & 6200.1^{\circ} & 0.011 \ 6 & 6.52 \ A & av E = 220.5 \ 54 \\ (714^{60} \ I A) & 6169.9^{\circ} & 0.011 \ 6 & 6.52 \ A & av E = 223.0 \ 53 \\ (780^{60} \ I A) & 6169.9^{\circ} & 0.016 \ A & 6.78 \ I S & av E = 223.3 \ 55 \\ (780^{60} \ I A) & 6103.9^{\circ} & 0.057 \ 20 & 6.21 \ I A & av E = 223.3 \ 55 \\ (780^{60} \ I A) & 6013.9^{\circ} & 0.057 \ 20 & 6.21 \ I A & av E = 223.3 \ 55 \\ (81^{60} \ I A) & 6013.9^{\circ} & 0.057 \ 20 & 6.21 \ I A & av E = 223.3 \ 55 \\ (81^{60} \ I A) & 603.9^{\circ} & 0.057 \ 20 & 6.21 \ A & av E = 237.5 \ 56 \\ (81^{60} \ I A) & 5968.5^{\circ} & 0.14 \ I Z & 6.2 \ A & av E = 230.5 \ 58 \\ (1052^{60} \ I A) & 5870.8^{\circ} & 0.072 \ 20 \ 7.0 \ A & av E = 3505 \ 58 \\ (1052^{60} \ I A) & 5870.8^{\circ} & 0.072 \ 20 \ 7.0 \ A & av E = 3505 \ 58 \\ (1052^{60} \ I A) & 5870.8^{\circ} & 0.072 \ 20 \ 7.0 \ A & av E = 396.1 \ 59 \\ (1276^{60} \ I A) & 5500.2 \ 0.25 \ 3 & 6.12 \ 4 & av E = 396.1 \ 59 \\ (1276^{60} \ I A) & 5201.06^{\circ} & 0.24 \ 3 \ 6.60 \ av E = 396.1 \ 59 \\ (1276^{60} \ I A) \ 5201.06^{\circ} & 0.24 \ 3 \ 6.80 \ av E = 396.1 \ 59 \\ (1276^{60} \ I A) \ 5201.06^{\circ} & 0.24 \ 3 \ 6.80 \ av E = 396.1 \ 59 \\ (1276^{60} \ I A) \ 5201.06^{\circ} & 0.24 \ 3 \ 6.80 \ av E = 396.1 \ 59 \\ (1276^{60} \ I A) \ 5201.06^{\circ} & 0.24 \ 3 \ 6.80 \ av E = 396.1 \ 59 \\ (1276^{60} \ I A) \ 5201.06^{\circ} & 0.24 \ 3 \ 6.80 \ 122 \ 7.21 \ 8 \ av E = 279.3 \ 6.2 \\ (1867 \ I A) \ 501.5 \ 7.77 \ av E = 279.7 \ 6.5 \ 6.5 \\ (1867 \ I A) \ 501.5 \ 7.77 \ av E = 279.7 \ 6.5 \ 6.5 \\ (2176^{60} \ I A) \ 5201.06^{\circ} & 0.24 \ 3 \ 6.80 \ 122 \ 7.83 \ 6.5 \ 6.5 \\ (2156^{60} \ I A) \ 545.5 \ 6.5 \ $ | (260 14) | 6624.07 | 0.55 4 | 3.71 9 | av E β =73.1 44 |
| $ \begin{array}{c} (631^{\circ0} \ I 4) & (253.5? \\ (684^{\circ0} \ I 4) & (200.1? \\ 0.011 \ 6 & (82.24) & w \ Eg=220.5 \ 53 \\ (684^{\circ0} \ I 4) & (6169.9? \\ 0.014 \ 6 & (5.81 \ 3a \ Eg=220.5 \ 53 \\ (710^{\circ0} \ I 4) & (6169.9? \\ 0.014 \ 6 & (5.81 \ 3a \ Eg=230.5 \ 54 \\ (710^{\circ0} \ I 4) & (6125.4? \\ 0.09 \ 3 & (6.67 \ 5a \ vec{} Eg=233.3 \ 55 \\ (710^{\circ0} \ I 4) & (6125.6? \\ 0.16 \ 2 & (5.23 \ 3c \ 5c \ 5a \ column{} ef{} eg=233.3 \ 55 \\ (810^{\circ0} \ I 4) & (603.9? \\ 0.05 \ 2 & (5.23 \ 3c \ 5c \ column{} ef{} eg=233.3 \ 55 \\ (811^{\circ0} \ I 4) & (603.9? \\ 0.015 \ I 2 & (710^{\circ0} \ I 4) \ 2 \ 555 \ 6a \ vec{} Eg=237.4 \ 55 \\ (811^{\circ0} \ I 4) & (603.6? \\ 0.015 \ I 2 & (710^{\circ0} \ I 4) \ 5570.8? \\ (811^{\circ0} \ I 4) \ 5565.7 \\ (811^{\circ0} \ I 4) \ 5565.7 \\ (915^{\circ0} \ I 4) \ 5565.7 \\ (902^{\circ0} \ I 4) \ 5580.1? \\ (1052^{\circ0} \ I 4) \ 5580.1? \\ (1023^{\circ0} \ I 4) \ 5580.1? \\ (1124 \ I 4) \ 5760.2 \\ 0.23 \ 6.12 \ 5a \ vec{} Eg=379.5 \ 58 \\ (1124 \ I 4) \ 5760.2 \\ 0.23 \ 6.12 \ 5a \ vec{} Eg=379.5 \ 58 \\ (1124 \ I 4) \ 5760.2 \\ 0.24 \ 3a \ 6.80 \ 6a \ vec{} Eg=379.5 \ 58 \\ (1124 \ I 4) \ 5760.2 \\ 0.25 \ 3a \ Eg=370.15 \ 6a \ column{} (1126^{\circ0} \ I 4) \ 521.78 \\ 0.127^{\circ0} \ (I 4) \ 521.78 \\ 0.127^{\circ0} \ (I 4) \ 521.78 \\ 0.12 \ (I 126^{\circ0} \ I 4) \ 521.78 \\ 0.12 \ (I 126^{\circ0} \ I 4) \ 521.78 \\ 0.12 \ (I 126^{\circ0} \ I 4) \ 521.78 \\ 0.12 \ (I 126^{\circ0} \ I 4) \ 521.78 \\ 0.12 \ (I 14) \ 4454.07 \\ 0.15 \ J \ 7.19 \ av \ Eg=718.5 \ 63 \ column{} (I 127^{\circ0} \ I 4) \ 521.6 \ column{} (I 127^{\circ0} \ I 4) \ 521.6 \ column{} (I 127^{\circ0} \ I 4) \ 4454.07 \\ 0.15 \ J \ 7.19 \ av \ Eg=718.5 \ 65 \ column{} (I 127^{\circ0} \ I 4) \ 4454.07 \ 1.37 \ Column{} (I 128^{\circ0} \ I 14^{\circ0} \ I 148^{\circ0} \ I \ I 128^{\circ0} \ I 148^{\circ0} \ I 128^{\circ0} \ I 148^{\circ0} \ $ | (475 [@] 14) | 6409.0? | 0.045 14 | 5.66 15 | av E β =144.4 50 |
| | (631 [@] 14) | 6253.5? | 0.033 10 | 6.21 14 | av E β =200.5 53 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (684 [@] 14) | 6200.1? | 0.011 6 | 6.82 24 | av E β =220.5 54 |
| $ \begin{aligned} & (758^{\circ} \ 14) \ 6126.4? \\ & (710^{\circ} \ 14) \ 6114.5? \\ & (0.067 \ 20) \ 6.21 \ 14 \\ & av \ E\beta=237.4 \ 55 \\ & (831^{\circ} \ 14) \ 6013.9? \\ & (0.23 \ 3 \ 5.77 \\ & av \ E\beta=237.4 \ 55 \\ & (831^{\circ} \ 14) \ 6052.6? \\ & (0.16 \ 2 \ 5.95 \ 6 \\ & av \ E\beta=237.4 \ 55 \\ & (811^{\circ} \ 14) \ 6013.0? \\ & (0.15 \ 2 \ 5.95 \ 6 \\ & av \ E\beta=237.5 \ 56 \\ & (811^{\circ} \ 14) \ 5068.5? \\ & (0.112^{\circ} \ 0.16 \ 2 \ 2 \ 4 \\ & av \ E\beta=330.5 \ 58 \\ & (1052^{\circ} \ 14) \ 5870.8? \\ & (0.027 \ 20 \ 7.0 \ 4 \\ & av \ E\beta=330.5 \ 58 \\ & (1052^{\circ} \ 14) \ 5870.8? \\ & (0.027 \ 20 \ 7.0 \ 4 \\ & av \ E\beta=330.5 \ 58 \\ & (1124 \ 14) \ 5800.1? \\ & (0.293 \ 6.12 \ 2 \ 53 \ 6.24 \ 6 \\ & av \ E\beta=395.5 \ 58 \\ & (1124 \ 14) \ 5608.1? \\ & (0.25 \ 3 \ 6.24 \ 6 \\ & av \ E\beta=395.5 \ 58 \\ & (1124 \ 14) \ 5608.1? \\ & (0.25 \ 3 \ 6.24 \ 6 \\ & av \ E\beta=395.5 \ 58 \\ & (1124 \ 14) \ 5608.1? \\ & (0.25 \ 3 \ 6.24 \ 6 \ av \ E\beta=395.6 \ 59 \\ & (1126^{\circ} \ 14) \ 5608.1? \\ & (0.24 \ 3 \ 6.24 \ 6 \ 6 \ 4x \ E\beta=396.1 \ 59 \\ & (1126^{\circ} \ 14) \ 5608.1? \\ & (0.24 \ 6 \ 6 \ 4x \ E\beta=396.1 \ 59 \\ & (1126^{\circ} \ 14) \ 5121.6? \\ & (0.243 \ 6.0 \ 6 \ 4x \ E\beta=584.0 \ 62 \\ & (166^{\circ} \ 14) \ 5121.6? \\ & (0.243 \ 14) \ 5121.6? \\ & (0.243 \ 14) \ 5121.6? \\ & (0.243 \ 14) \ 5121.6? \\ & (0.53 \ 4) \ 4371.16 \ 6.407 \ 512 \ av \ E\beta=582.0 \ 62 \\ & (1867 \ 14) \ 501.69 \ 0.354 \ 4 \ 375 \ 3v \ E\beta=783.6 \ 65 \\ & (2430 \ 14) \ 4474.05? \\ & (0.53 \ 14) \ 42470.5$ | (714 [@] 14) | 6169.9? | 0.014 4 | 6.78 13 | av E β =232.0 54 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (758 [@] 14) | 6126.4? | 0.09 3 | 6.06 15 | av E β =248.7 55 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (770 [@] 14) | 6114.5? | 0.067 20 | 6.21 14 | av E β =253.3 55 |
| $ \begin{array}{llllllllllllllllllllllllllllllllllll$ | (780 [@] 14) | 6103.9? | 0.23 3 | 5.70 7 | av E β =257.4 55 |
| | (831 [@] 14) | 6052.6? | 0.16 2 | 5.95 6 | av E β =277.5 56 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (871 [@] 14) | 6013.0? | 0.015 12 | 7.1 4 | av E β =293.1 56 |
| $ \begin{array}{llllllllllllllllllllllllllllllllllll$ | (916 [@] 14) | 5968.5? | 0.14 12 | 6.2 4 | av E β =310.9 57 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | $(1013^{@} 14)$ | 5870.8? | 0.027 20 | 7.0 4 | av E β =350.5 58 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $(1052^{@} 14)$ | 5832.2? | 0.10 3 | 6.53 14 | av E β =366.3 58 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $(1084^{@} 14)$ | 5800.1? | 0.29 3 | 6.12 5 | av E β =379.5 58 |
| $\begin{array}{llllllllllllllllllllllllllllllllllll$ | (1124 14) | 5760.2 | 0.25 3 | 6.24 6 | av E β =396.1 59 |
| $ \begin{array}{llllllllllllllllllllllllllllllllllll$ | (1276 [@] <i>14</i>) | 5608.1? | 0.15 4 | 6.67 12 | av E β =460.0 60 |
| $ \begin{array}{llllllllllllllllllllllllllllllllllll$ | (1563 [@] 14) | 5321.06? | 0.24 3 | 6.80 6 | av E β =584.0 62 |
| $ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$ | (1666 [@] 14) | 5217.8 | 0.12 2 | 7.21 8 | av E β =629.3 62 |
| $ \begin{array}{llllllllllllllllllllllllllllllllllll$ | (1867 14) | 5016.99 | 0.50 9 | 6.79 8 | av $E\beta = 718.5 \ 63$ |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (1937 14) | 4947.5 | 0.38 4 | 6.97 5 | av E β =749.7 63 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $(2173 \bullet 14)$ | 4711.2 | 0.053 14 | 8.03 12 | av $E\beta = 856.4 \ 64$ |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $(2339\ 14)$ | 4545.0 | 0.15 3 | 7.719 | av $E\beta = 932.064$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | (2410 - 14) (2430 - 14) | 44/4.05? | 0.374 | 1.37 3 | av $E\beta = 964.5 \text{ 65}$ |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (2430 14) (2615 14) | 4269.33 | 4.71 16 | 6.407 19 | $av E\beta = 1058.5.65$ |
| $ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$ | (3011 14) | 3873.13 | 0.19 8 | 8.06 19 | av $E\beta = 1241.8 \ 65$ |
| $\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$ | (3672 14) | 3211.90 | 0.23 7 | 8.34 14 | av $E\beta = 1550.2 \ 66$ |
| (4015 14)2869.004.6 47.20 4av $E\beta=1711.0$ 66 E(decay): other: 4060 120 (1980KcZQ).(4035 14)2849.410.86 117.94 6av $E\beta=1720.2$ 66(4250 14)2634.16 34^{\dagger} 26.44 3av $E\beta=1821.3$ 66(4302 14)2582.4 ≈ 0.1 ≈ 9.0 av $E\beta=1821.3$ 66(4324 14)2559.882.5 27.61 4av $E\beta=1856.2$ 66Log ft:inconsistent with $\Delta J=3$ transition and possibily indicates unobserved feeding to this level.(4469 14)2414.746.0 47.29 3av $E\beta=1924.5$ 66 E(decay): other: 4570 180 (1980KcZQ).(4594 14)2289.539.9 77.12 4av $E\beta=1983.4$ 66 E(decay): other: see table above.(5571 14)1313.02828.8 [†] 197.03 3av $E\beta=3061.7$ 66 E(decay): other: see table above.(6884 14)0.0 $\approx 3^{\ddagger}$ ≈ 8.4 av $E\beta=3061.7$ 66 E(decay): other: see table above. | (3905 14) | 2979.11 | 0.31 5 | 8.32 7 | av $E\beta = 1659.3 \ 66$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | (4015 14) | 2869.00 | 4.6 4 | 7.20 4 | av $E\beta = 1/11.0.66$ E(decay), other 4060, 120 (1080KeZO) |
| (4250 14) 2634.16 $34^{\dagger} 2$ 6.44 3 av $E\beta$ =1821.3 66 (4302 14) 2582.4 ≈ 0.1 ≈ 9.0 av $E\beta$ =1845.6 66 (4324 14) 2559.88 2.5 2 7.61 4 av $E\beta$ =1856.2 66 (4469 14) 2414.74 6.0 4 7.29 3 av $E\beta$ =1924.5 66 (4594 14) 2289.53 9.9 7 7.12 4 av $E\beta$ =1983.4 66 E(decay): other: see table above. (5571 14) 1313.028 28.8 [†] 19 7.03 3 av $E\beta$ =2443.3 66 E(decay): other: see table above. (6884 14) 0.0 $\approx 3^{\ddagger} \approx 8.4$ av $E\beta$ =3061.7 66 E(decay): other: see table above. | (4035 14) | 2849.41 | 0.86 11 | 7.94 6 | E(decay): other: 4000 120 (1980 ReZQ). av $E\beta = 1720.2.66$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | (4250, 14) | 2634.16 | 34^{\dagger} 2 | 6.44.3 | av $E\beta = 1821.3$ 66 |
| (4302 14) 2582.4 ≈ 0.1 ≈ 9.0 av $E\beta = 1845.6$ β^{-1} : from I(ce) (1991Ma07). (4324 14) 2559.88 2.5 2 7.61 4 av $E\beta = 1856.2$ 66 Log ft: inconsistent with $\Delta J = 3$ transition and possibily indicates unobserved feeding to this level. (4469 14) 2414.74 6.0 7.29 3 $av E\beta = 1924.5$ 66 (4594 14) 2289.53 9.9 7 7.12 4 $av E\beta = 1983.4$ 66 E(decay): other: set table above. $(5571 14)$ 1313.028 28.8^{\dagger} 19 7.03 3 $av E\beta = 3061.7$ 66 E(decay): other: see table above. $av E\beta = 3061.7$ 66 $E(decay)$: other: see table above. | (120017) | 200 1110 | 0 | 01110 | E(decay): other: see table above. |
| $(4324\ 14)$ 2559.88 $2.5\ 2$ $7.61\ 4$ $I\beta^-$: from I(ce) (1991Ma07). av $E\beta$ =1856.2 66 Log ft: inconsistent with ΔJ =3 transition and possibily indicates unobserved feeding to this level. $(4469\ 14)$ 2414.74 $6.0\ 4$ $7.29\ 3$ av $E\beta$ =1924.5 66 E(decay): other: $4570\ 180\ (1980KeZQ).$ $(4594\ 14)$ 2289.53 $9.9\ 7$ $7.12\ 4$ av $E\beta$ =1983.4 66 E(decay): other: see table above. $(5571\ 14)$ $1313.028\ 28.8^{\dagger}\ 19$ $7.03\ 3$ av $E\beta$ =2443.3 66 E(decay): other: see table above. $(6884\ 14)$ $0.0\ \approx 3^{\ddagger}$ ≈ 8.4 av $E\beta$ =3061.7 66 E(decay): other: see table above. | (4302 14) | 2582.4 | ≈0.1 | ≈9.0 | av E β =1845.6 66 |
| (4324 14)2559.882.5 27.61 4av $E\beta$ =1856.2 66Log ft:inconsistent with ΔJ =3 transition and possibily indicates unobserved feeding to this level.(4469 14)2414.746.0 47.29 3av $E\beta$ =1924.5 66(4594 14)2289.539.9 77.12 4av $E\beta$ =1983.4 66(5571 14)1313.02828.8 [†] 197.03 3av $E\beta$ =2443.3 66(6884 14)0.0 $\approx 3^{\ddagger}$ ≈ 8.4 av $E\beta$ =3061.7 66(6284 14)0.0 $\approx 3^{\ddagger}$ ≈ 8.4 | (1224 1.0) | 2550.00 | 252 | 7 (1) | $I\beta^{-1}$: from I(ce) (1991Ma07). |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | (4324-14) | 2559.88 | 2.5 2 | 7.61 4 | av $B\beta = 1856.2$ 66 |
| (4469 14) 2414.74 6.0 4 7.29 3 av $E\beta$ =1924.5 66 (4594 14) 2289.53 9.9 7 7.12 4 av $E\beta$ =1983.4 66 (5571 14) 1313.028 28.8 [†] 19 7.03 3 av $E\beta$ =2443.3 66 (6884 14) 0.0 $\approx 3^{\ddagger}$ ≈ 8.4 av $E\beta$ =3061.7 66 (cleary): other: see table above. (cleary): other: see table above. | | | | | feeding to this level. |
| (4594 14) 2289.53 9.9 7 7.12 4 E(decay): other: 4570 180 (1980KeZQ). av E β =1983.4 66 E(decay): other: see table above. (5571 14) 1313.028 28.8 [†] 19 7.03 3 av E β =2443.3 66 E(decay): other: see table above. (6884 14) 0.0 $\approx 3^{\ddagger}$ ≈ 8.4 av E β =3061.7 66 E(decay): other: see table above. | (4469 14) | 2414.74 | 6.0 4 | 7.29 3 | av E β =1924.5 66 |
| (4594 14) 2289.53 9.9 7 7.12 4 av $E\beta$ =1983.4 66 E(decay): other: see table above. (5571 14) 1313.028 28.8 [†] 19 7.03 3 av $E\beta$ =2443.3 66 E(decay): other: see table above. (6884 14) 0.0 $\approx 3^{\ddagger}$ ≈ 8.4 av $E\beta$ =3061.7 66 E(decay): other: see table above. | | | | | E(decay): other: 4570 180 (1980KeZQ). |
| $(5571 \ 14) \qquad 1313.028 \qquad 28.8^{\dagger} \ 19 \qquad 7.03 \ 3 \qquad \text{av } E\beta = 2443.3 \ 66 \\ E(\text{decay}): \text{ other: see table above.}$ $(6884 \ 14) \qquad 0.0 \qquad \approx 3^{\ddagger} \qquad \approx 8.4 \qquad \text{av } E\beta = 3061.7 \ 66 \\ E(\text{decay}): \text{ other: see table above.}$ | (4594 14) | 2289.53 | 9.9 7 | 7.12 4 | av $E\beta = 1983.4$ 66 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | | 1010.000 | a a a [†] ta | 7.02.2 | E(decay): other: see table above. |
| (6884 14) $0.0 \approx 3^{\ddagger} \approx 8.4$ av $E\beta$ =3061.7 66 E(decay): other: see table above. | (55/1 14) | 1313.028 | 28.8 19 | 7.03 3 | av $E\beta = 2443.3$ 60 E(decay): other: see table above |
| E(decay): other: see table above. | (6881 11) | 0.0 | ~3‡ | ~81 | Equilater r_{1} , other above, r_{2} = 2061.7.66 |
| | (000+14) | 0.0 | ~5. | ~0.4 | E(decay): other: see table above. |

[†] I(\leq 4.3–MeV β)/I(5.62-MeV β)=3.6 (1959Jo37) compared to 1.47 *11* derived from the decay scheme. [‡] From I(5.6-MeV β) and I(7.0-MeV β)/I(5.6-MeV β)=0.1 (1959Jo37). Evaluator considers this ratio to be approximate due to the

¹³⁶**I** β^{-} decay (83.4 s) 1977We04,1991Ma07 (continued)

β^{-} radiations (continued)

presence of several strong \approx 5–MeV β 's in the decay of the two isomers. [#] Absolute intensity per 100 decays.

[@] Existence of this branch is questionable.

$\gamma(^{136}\text{Xe})$

Iy normalization: from $\Sigma I(\gamma + ce)(to g.s.) + I\beta(g.s.) = 100$ with assumption of a 50% uncertainty in I $\beta(g.s.)$ (evaluator) and including tentatively placed transitions. If tentative transitions are excluded, the normalization becomes 0.0674 12.

| E_{γ}^{\dagger} | $I_{\gamma}^{\dagger \# a}$ | E_i (level) | \mathbf{J}_i^{π} | \mathbf{E}_{f} | \mathbf{J}_f^{π} | Mult. | α | Comments |
|------------------------|-----------------------------|---------------|-------------------------|------------------|----------------------|---------|------------|--|
| 219.33 15 | 12.3 10 | 2634.16 | 1+,2+ | 2414.74 | 2+ | not E1 | | $\alpha(K)\exp=0.174 \ 44 \ (1991Ma07)$ Mult : from $\alpha(K)\exp$ |
| 270.2 3 | 3.1 8 | 2559.88 | (4 ⁺) | 2289.53 | 2^{+} | | | multi nom u(n)exp. |
| 309.1 2 | 5.1 5 | 2869.00 | (2^{+}) | 2559.88 | (4^{+}) | | | |
| 344.72 10 | 36 3 | 2634.16 | 1+,2+ | 2289.53 | 2+ | M1+E2 | 0.0277 9 | $\alpha(K)\exp=0.022 \ 4 \ (1991Ma07)$ $\alpha(K)=0.0235 \ 11; \ \alpha(L)=0.0034$ $3; \ \alpha(M)=0.00069 \ 6;$ $\alpha(N)=0.000142 \ 11;$ $\alpha(O)=1.71\times10^{-5} \ 7$ |
| 262.5.4 | 10.2 | 2211.00 | (1.0+) | 20.40.41 | (1.0+) | | | Mult.: from $\alpha(K)$ exp. |
| 362.5 4 | 1.9 3 | 3211.90 | (1,2') | 2849.41 | (1,2') | | | |
| (381.359 7) | 14.0 ^w 13 | 1694.387 | 4+ | 1313.028 | 2+ | E2 | 0.0198 | $\alpha(K)=0.01652 24; \alpha(L)=0.00259 4; \alpha(M)=0.000532 8; \alpha(N)=0.0001085 16 \alpha(O)=1.274 \times 10^{-5} 18$ |
| 396.0 2 | 6.4 8 | 4269.33 | $2^{(+)}$ | 3873.13 | (3^{-}) | | | |
| 431.38 12 | 3.0 10 | 2125.70 | $\frac{1}{3^{+}.4^{+}}$ | 1694.387 | 4 ⁺ | | | |
| 434.18 11 | 11.9 9 | 2559.88 | (4^{+}) | 2125.70 | 3+,4+ | | | |
| 597.8 2 | 5.4 6 | 3873.13 | (3 ⁻) | 3275.22 | 3- | | | |
| 812.63 8 | 13 4 | 2125.70 | 3+,4+ | 1313.028 | 2+ | | | |
| 865.5 <i>3</i> | 9.6 8 | 2559.88 | (4^{+}) | 1694.387 | 4+ | | | |
| 976.5 2 | 40 <i>3</i> | 2289.53 | 2+ | 1313.028 | 2^{+} | | | |
| 994.2 2 | 24.2 13 | 4269.33 | $2^{(+)}$ | 3275.22 | 3- | | | |
| 1057.4 4 | 4.3 7 | 4269.33 | $2^{(+)}$ | 3211.90 | $(1,2^+)$ | | | |
| 1101.4 <i>3</i> | 7.2 11 | 2414.74 | 2+ | 1313.028 | 2^{+} | | | |
| 1178.6 <i>3</i> | 3.3 5 | 4454.07 | $1^{(-)}, 2^{(+)}$ | 3275.22 | 3- | | | |
| 1246.84 10 | 34.0 18 | 2559.88 | (4 ⁺) | 1313.028 | 2+ | | | |
| 1313.02 1 | 1000 | 1313.028 | 2+ | 0.0 | 0^{+} | | | |
| 1321.08 10 | 372 26 | 2634.16 | 1+,2+ | 1313.028 | 2+ | M1(+E2) | 0.00105 72 | $\alpha(K)\exp=0.00097\ 22$ (1991Ma07) $\alpha(K)=0.00089\ 11;$ $\alpha(L)=0.000110\ 12;$ $\alpha(M)=2.21\times10^{-5}\ 25;$ $\alpha(N)=4.6\times10^{-6}\ 5;$ $\alpha(O)=5.7\times10^{-7}\ 7$ Mult.: from $\alpha(K)\exp$. |
| 1399.9 5 | 1.6 4 | 4269.33 | $2^{(+)}$ | 2869.00 | (2^+) | | | . / . |
| 1536.4 <i>1</i> | 19.4 11 | 2849.41 | $(1,2^+)$ | 1313.028 | 2+ | | | |
| 1555.97 <i>15</i> | 7.0 5 | 2869.00 | (2^{+}) | 1313.028 | 2+ | | | |
| 1583.5 2 | 3.8 5 | 3873.13 | (3 ⁻) | 2289.53 | 2+ | | | |
| 1624.8 [°] 3 | 3.5 5 | 4474.05? | 1 | 2849.41 | $(1,2^+)$ | | | |
| 1635.2 2 | 5.6 6 | 4269.33 | $2^{(+)}$ | 2634.16 | $1^+, 2^+$ | | | |

Continued on next page (footnotes at end of table)

| | | | 136 I β^- decay | (83.4 s) | 1977We | e04,1991Ma07 (continued) |
|--------------------------------------|-----------------------------|------------------------|----------------------------|------------------|--------------------------------|--------------------------|
| | | | | $\gamma(^{136})$ | Xe) (con | tinued) |
| E_{γ}^{\dagger} | $I_{\gamma}^{\dagger \# a}$ | E _i (level) | J^{π}_i | E_f | \mathbf{J}_f^{π} | Mult. |
| 1666.0 4 | 2.6 4 | 2979.11 | $1^+.2^+$ | 1313.028 | 2+ | |
| 1709.4 2 | 10.4 7 | 4269.33 | $2^{(+)}$ | 2559.88 | (4^+) | |
| 1820.0.3 | 3.2.4 | 4454.07 | $1^{(-)}.2^{(+)}$ | 2634.16 | 1+.2+ | |
| 1911.1 4 | 1.4 3 | 4545.0 | $1.2^{(+)}$ | 2634.16 | $1^{+}.2^{+}$ | |
| 1962.2 3 | 34.2 19 | 3275.22 | 3- | 1313.028 | 2+ | |
| 1968.4 <i>4</i> | 2.5 4 | 4947.5 | | 2979.11 | $1^+, 2^+$ | |
| 1979.6 <i>3</i> | 2.0 3 | 4269.33 | $2^{(+)}$ | 2289.53 | 2^{+} | |
| 2039.2 4 | 2.4 4 | 4454.07 | $1^{(-)}, 2^{(+)}$ | 2414.74 | 2^{+} | |
| 2168.2 11 | 1.2 8 | 5016.99 | $(1,2^{+})$ | 2849.41 | $(1,2^+)$ | |
| 2289.6 2 | 156 8 | 2289.53 | 2+ | 0.0 | 0^{+} | |
| 2382.7 3 | 3.2 4 | 5016.99 | $(1,2^+)$ | 2634.16 | $1^+, 2^+$ | |
| 2414.6 2 | 102 5 | 2414.74 | 21 | 0.0 | $(1, 2^{+})$ | |
| 2548.2 4 | 1.9 4 | 3700.2 | 0+ | 5211.90 | (1,2) | no [†] |
| 2582.4 | 1.9.0 | 2382.4 | $(1, 2^{+})$ | 0.0 | 0^{+} | E0* |
| 2001.8 9 | 1.8 9 | 2634 16 | (1,2) 1+2+ | 2414.74 | 2 0+ | |
| $2657 \text{ obc} \Lambda$ | $1 \sqrt{b} 2$ | 2034.10 4047 5 | 1,2 | 2280.53 | 0 2+ | |
| 2037.9 4 | 1.4 2 | 4947.J | | 2209.33 | (4^{\pm}) | |
| 2037.9° 4 | 1.4 2 | 5217.8 | 1- | 2009.88 | (4^{+}) | |
| 2828.5 5 | 0.5.2 | 2849 41 | $(1 2^+)$ | 0.0 | 0^{+} | |
| 2868.9 2 | 59 <i>5</i> | 2869.00 | (2^+) | 0.0 | 0^{+} | |
| 2956.3 2 | 10.8 6 | 4269.33 | 2(+) | 1313.028 | 2+ | |
| 2979.1 <i>3</i> | 4.6 4 | 2979.11 | $1^+, 2^+$ | 0.0 | 0^{+} | |
| 3141.1 <i>3</i> | 10.4 6 | 4454.07 | $1^{(-)}, 2^{(+)}$ | 1313.028 | 2+ | |
| 3195.4 ^c 4 | 2.5 3 | 5321.06? | $(1^+, 2^+)$ | 2125.70 | 3+,4+ | |
| 3211.8 3 | 7.7 5 | 3211.90 | $(1,2^+)$ | 0.0 | 0+ | |
| 3272.2 7 | 1.3 3 | 5832.2? | $(2^+,3,4^+)$ | 2559.88 | (4^{+}) | |
| 3349.23 | 2.95 | 4047.5 | | 1212.029 | 5 2+ | |
| 3034.0° 3 | $1.8^{\circ} 2$ | 4947.5 | | 1313.028 | Z' 2+ 4+ | |
| 3634.0° 3 3673.9 <mark>° 4</mark> | $1.8^{\circ} 2$ | 5760.2 5800.1? | 1 | 2125.70 | $3^{+},4^{+}$ $3^{+},4^{+}$ | |
| 3775.0 ^{bc} 10 | 0.40^{b} 18 | 6409.0? | (1.2^+) | 2634.16 | $1^+.2^+$ | |
| $3775 0^{bc} 10$ | 0.40^{b} 18 | 6624.07 | (1,2) | 2849 41 | $(1 2^+)$ | |
| 4063.9 [°] 4 | 2.5.3 | 6624.07 | | 2559.88 | (1,2) (4^+) | |
| 4208.9 5 | 0.69 17 | 6624.07 | | 2414.74 | 2+ | |
| 4269.5 2 | 5.3 3 | 4269.33 | $2^{(+)}$ | 0.0 | 0^{+} | |
| 4320 | | 4320.1? | 0^{+} | 0.0 | 0^{+} | E0 [‡] |
| 4454.5 7 | 0.60 15 | 4454.07 | $1^{(-)}, 2^{(+)}$ | 0.0 | 0^{+} | |
| 4473.8 [°] 3 | 2.0 2 | 4474.05? | 1 | 0.0 | 0^{+} | |
| 4519.1 [°] 10 | 0.22 10 | 5832.2? | $(2^+, 3, 4^+)$ | 1313.028 | 2+ | |
| 4544.4 5 | 0.86 17 | 4545.0 | $1,2^{(+)}$ | 0.0 | 0^+ | |
| 4711.1 4 | 0.8 2 | 4711.2 | 1 | 0.0 | 0^+ | |
| 4/39.1° 5 | 1.6 2 1.71 <i>18</i> | 6052.6? 6624.07 | $(1,2^{+})$ | 1515.028 | 2' 4+ | |
| 5017.0.3 | 1 30 14 | 5016 99 | $(1 2^+)$ | 0.0 | $^{+}_{0^{+}}$ | |
| 5217.5 [°] 11 | 0.40 14 | 5217.8 | (1,2) | 0.0 | 0^{+} | |
| 5320.9 [°] 3 | 1.1 2 | 5321.06? | $(1^+, 2^+)$ | 0.0 | 0^{+} | |
| 5608.0 [°] 4 | 2.2 5 | 5608.1? | 1 | 0.0 | 0^{+} | |
| 5800.5 ^{&c} 4 | 1.9 4 | 5800.1? | 1 | 0.0 | 0^{+} | |
| 5870.7 ^{&c} 12 | 0.4 3 | 5870.8? | 1 | 0.0 | 0^{+} | |
| 5968.4 ^{&c} 10 | 0.21 18 | 5968.5? | $(1,2^{+})$ | 0.0 | 0^{+} | |
| | | | | | | |

Continued on next page (footnotes at end of table)

136 I β^- decay (83.4 s) 1977We04,1991Ma07 (continued)

$\gamma(^{136}$ Xe) (continued)

| E_{γ}^{\dagger} | $I_{\gamma}^{\dagger \# a}$ | E _i (level) | \mathbf{J}_i^{π} | $\mathbf{E}_f \mathbf{J}_f^{\pi}$ | ${\rm E_{\gamma}}^{\dagger}$ | $I_{\gamma}^{\dagger \# a}$ | E _i (level) | \mathbf{J}_i^{π} | $\mathbf{E}_f \mathbf{J}_f^{\pi}$ |
|------------------------------|-----------------------------|------------------------|----------------------|------------------------------------|-------------------------------|-----------------------------|------------------------|----------------------|------------------------------------|
| 6012.9 ^{&c} 10 | 0.22 18 | 6013.0? | $(1,2^+)$ | $0.0 \ 0^+$ | 6169.7 <mark>&</mark> c 8 | 0.21 6 | 6169.9? | $(1,2^+)$ | $0.0 \ 0^+$ |
| 6052.8 <mark>&c</mark> 5 | 0.8 2 | 6052.6? | $(1,2^+)$ | $0.0 \ 0^+$ | 6199.9 <mark>&c</mark> 13 | 0.17 8 | 6200.1? | $(1,2^+)$ | $0.0 \ 0^+$ |
| 6104.2 ^{&c} 6 | 2.0 4 | 6103.9? | 1- | $0.0 \ 0^+$ | 6253.3 ^{&c} 8 | 0.50 15 | 6253.5? | 1 | $0.0 \ 0^+$ |
| 6114.4 ^{&c} 7 | 1.0 3 | 6114.5? | 1 | $0.0 \ 0^+$ | 6408.5 ^{&c} 12 | 0.28 10 | 6409.0? | $(1,2^+)$ | $0.0 \ 0^+$ |
| 6126.3 <mark>&c</mark> 5 | 1.4 4 | 6126.4? | 1 | $0.0 \ 0^+$ | | | | | |

[†] From 1977We04, except where noted.

[‡] ce seen but no corresponding γ ray (1991Ma07).

[#] Normalized to $I\gamma(1321\gamma)=372$ so that $I\gamma(1313\gamma)=1000$ for both 46.6-s and 83.4-s decay.

[@] E γ from 1979Bo26 (curved crystal spectrometer). I γ from intensity imbalance.

[&] These gammas were assumed to be g.s. transitions by 1977We04 from comparison of E γ to Q(β^{-}).

^{*a*} For absolute intensity per 100 decays, multiply by 0.0667 11.

^b Multiply placed with undivided intensity.

^c Placement of transition in the level scheme is uncertain.

¹³⁶I β^- decay (83.4 s) 1977We04,1991Ma07



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¹³⁶I β^- decay (83.4 s) 1977We04,1991Ma07



¹³⁶I β^- decay (83.4 s) 1977We04,1991Ma07

