^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 172,1 (2021)	31-Jan-2021

History

Parent: ^{100}Nb: E=314 *23*; J$^\pi$=(5)$^+$; T$_{1/2}$=2.99 s *11*; Q(β^-)=6396 *8*; %β^- decay=100

^{100}Nb-E,J$^\pi$,T$_{1/2}$: From ^{100}Nb Adopted Levels.

^{100}Nb-Q(β^-): From 2017Wa10.

2019Gu20 (also 2019Gu03): ^{100}Nb isotope from U(p,F),E=25 MeV at the IGISOL facility and JYFLTRAP double Penning trap system at the university of Jyvaskyla. Measured Eγ, Iγ, Eβ, $\beta\gamma$-coin, total absorption γ spectrum (TAGS) using Decay Total Absorption γ-ray Spectrometer (DTAS) with 18 NaI(Tl) crystals, a plastic β detector and an HPGe detector. Deduced β feedings, absolute cumulative γ-intensities deexciting the main levels in ^{100}Mo,average γ and β energies. Discussed impact on antineutrino spectrum summation calculations. Comparison with evaluated data in ENSDF, ENDF/B-VII.1 and JEFF-3.1.1. The β feedings were obtained from the authors in a private communication.

2012Ro01: ^{100}Nb produced at IGISOL facility, via proton-induced fission of uranium, and mass separated using JYFLTRAP Penning trap system and Ramsey laser technique to separate the ground state and isomeric activities at Jyvaskyla accelerator facility. The detector array consisted of a plastic β scintillator, two Ge clovers, and one Ge LOAX detector. Complete isolation of the two activities could not be achieved in this study.

2001Su11: ^{100}Nb isotope obtained from proton fission of ^{238}U at E(p)=25 MeV. Mass separated source with A=100 isobars collected on a moving tape at Jyvaskyla accelerator facility. Measured Eγ, Iγ and $\gamma\gamma$ using four Ge detectors. It was claimed that the observed γ rays belonged almost entirely to the isomeric activity. Comparison with QRPA calculations.

1987Me06: source of ^{100}Nb from mass separation of fission fragments using JOSEF separator at Julich. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$ for a mixed activity of ground state and isomer.

1976Ah06: ^{100}Nb source from mass separation of fragments using TRIGA reactor at Mainz. Measured energies of 11 γ rays, placed among nine excited states up to 2468 keV. Source had mixed g.s. and isomeric activity. The γ-ray intensities and energy uncertainties were not provided.

1972He37: ^{100}Nb source from ^{100}Mo(n,p),E=14.8 MeV. Measured Eγ, Iγ, $\gamma\gamma$-coin, Eβ, $\beta\gamma$-coin. Deduced levels, Iβ feedings, log *ft*. A total 27 γ rays were reported and 20 placed among ten levels up to 2563 keV. The ^{100}Nb source used was a mixture of the two activities. Only the composite intensities were provided. Energy uncertainties were not given.

Others:

1984Pa19, 1983Ke09: ^{100}Nb from mass separation of fission fragments using OSTIS separator at ILL-Grenoble. Measured $\beta\gamma$-coin using mixed activity. Deduced Q(β) value.

1988GrZX, 1980KeZP: measured $\beta\gamma$-coin, deduced Q(β^-).

1984BuZS: measured $\gamma\gamma$-coin for nine γ rays. No other details given.

1979Bo26: measurement of precise energies of 535.6- and 528.3-keV γ rays using curved-crystal spectrometer.

1978St02: ^{100}Nb from mass separation of fission fragments using LOHENGRIN separator at ILL-Grenoble. Measured $\beta\gamma$-coin using mixed activity. Deduced Q(β) value.

1972Tr08: a 7.1-s activity in ^{100}Nb reported from observation of three γ rays. This half-life is actually for ^{100}Zr decay.

1970Ei02: ^{100}Nb from mass separation of fission fragments using gas-filled Online mass separator at the FRJ-2 reactor in Julich. Measured energies of three main gamma rays placed from three excited states, $\gamma\gamma$-coin and $\beta\gamma$-coin. Deduced Q(β) value. Half-life of 6.6 s *2* actually is for ^{100}Zr decay.

1969WiZX: ^{100}Nb from fission fragments of ^{252}Cf SF decay. Measured Eγ, deduced first excited state of ^{100}Mo.

1967Hu09: measured Eγ.

Total decay energy deposit of 6766 keV *325* calculated by RADLIST code is in agreement with expected value of 6710 keV *24*.

^{100}Mo Levels

E(level)[†]	J$^\pi$[@]
0.0	0$^+$
535.666 *14*	2$^+$
695.18 *10*	0$^+$
1063.930 *23*	2$^+$
1136.15 *9*	4$^+$

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^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20 (continued)

^{100}Mo Levels (continued)

E(level)†	J$^\pi$@	E(level)†	J$^\pi$@	E(level)†	E(level)†
1464.04 *13*	2+	2980# *20*		3820# *20*	4660# *20*
1607.25 *14*	(3+)	3020# *20*		3860# *20*	4700# *20*
1771.46 *15*	(4+)	3060# *20*		3900# *20*	4740# *20*
1847.16 *22*	6+	3100# *20*		3940# *20*	4780# *20*
2103.07 *14*	4+	3140# *20*		3980# *20*	4820# *20*
(2189.56‡ *15*)		3180# *20*		4020# *20*	4860# *20*
2289.1 *5*	(4,5+)	3220# *20*		4060# *20*	4900# *20*
2310.13 *20*	(4+)	3260# *20*		4100# *20*	4940# *20*
2380# *20*		3300# *20*		4140# *20*	4980# *20*
2416.56 *19*	(4+)	3340# *20*		4180# *20*	5020# *20*
2460# *20*		3380# *20*		4220# *20*	5060# *20*
2500# *20*		3420# *20*		4260# *20*	5100# *20*
2564.23 *16*	(4)+&	3460# *20*		4300# *20*	5140# *20*
2652.89 *22*	(4+,5+)	3500# *20*		4340# *20*	5180# *20*
2700# *20*		3540# *20*		4380# *20*	5220# *20*
2740# *20*		3580# *20*		4420# *20*	5260# *20*
2780# *20*		3626.5 *6*	(4+,5,6)	4460# *20*	5300# *20*
2820# *20*		3647.3 *7*	(5−)	4500# *20*	5340# *20*
2860# *20*		3700# *20*		4540# *20*	5380# *20*
2900# *20*		3740# *20*		4580# *20*	
2940# *20*		3780# *20*		4620# *20*	

† From least-squares fit to Eγ data.
‡ Level population suggested by 2019Gu20 (and priv. comm.) from TAGS data. Energy is taken from the Adopted Levels.
# Pseudo-level from 40-keV binned TAGS data 2019Gu20 (and priv. comm.). Uncertainty of 20 keV is assigned by evaluators based on 40-keV binned experimental data. This level is not included in the Adopted Levels.
@ From the Adopted Levels.
& 2001Su11 assign (5,6)+ on the basis that no transition is seen to levels of J<4, but L(p,p′)=4 for a 2563 *5* level suggests 4+.

β^- radiations

E(decay)	E(level)	Iβ^-†#	Log *ft*	Comments
(1330 *32*)	5380	0.005‡ *4*	6.6 *4*	av Eβ=494 *14* Iβ^-: 0.005 +*2*−*5*.
(1370 *32*)	5340	0.009‡ *5*	6.4 *3*	av Eβ=511 *14* Iβ^-: 0.009 +*3*−*6*.
(1410 *32*)	5300	0.016‡ *4*	6.2 *1*	av Eβ=529 *14* Iβ^-: 0.016 *4*.
(1450 *32*)	5260	0.024‡ *6*	6.0 *1*	av Eβ=547 *14* Iβ^-: 0.024 +*7*−*4*.
(1490 *32*)	5220	0.027‡ *8*	6.0 *2*	av Eβ=564 *14* Iβ^-: 0.027 +*12*−*3*.
(1530 *32*)	5180	0.022‡ *3*	6.2 *1*	av Eβ=582 *14* Iβ^-: 0.022 +*2*−*3*.
(1570 *32*)	5140	0.015‡ *5*	6.4 *2*	av Eβ=600 *14*

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^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20 (continued)

β^- radiations (continued)

E(decay)	E(level)	$I\beta^{-\dagger\#}$	Log *ft*	Comments
				$I\beta^-$: 0.015 *+4−5*.
(1610 *32*)	5100	0.013‡ *6*	6.5 *2*	av Eβ=618 *15* $I\beta^-$: 0.013 *+5−6*.
(1650 *32*)	5060	0.015‡ *5*	6.5 *2*	av Eβ=636 *15* $I\beta^-$: 0.015 *+5−4*.
(1690 *32*)	5020	0.023‡ *4*	6.3 *1*	av Eβ=654 *15* $I\beta^-$: 0.023 *+6−2*.
(1730 *32*)	4980	0.031‡ *15*	6.2 *2*	av Eβ=672 *15* $I\beta^-$: 0.031 *+17−12*.
(1770 *32*)	4940	0.036‡ *21*	6.2 *3*	av Eβ=690 *15* $I\beta^-$: 0.036 *+21−20*.
(1810 *32*)	4900	0.040‡ *19*	6.2 *2*	av Eβ=708 *15* $I\beta^-$: 0.040 *+16−22*.
(1850 *32*)	4860	0.049‡ *15*	6.1 *2*	av Eβ=726 *15* $I\beta^-$: 0.049 *+9−20*.
(1890 *32*)	4820	0.061‡ *8*	6.1 *1*	av Eβ=744 *15* $I\beta^-$: 0.061 *+7−8*.
(1930 *32*)	4780	0.065‡ *10*	6.1 *1*	av Eβ=763 *15* $I\beta^-$: 0.065 *+13−6*.
(1970 *32*)	4740	0.058‡ *14*	6.2 *1*	av Eβ=781 *15* $I\beta^-$: 0.058 *+20−8*.
(2010 *32*)	4700	0.051‡ *7*	6.3 *1*	av Eβ=799 *15* $I\beta^-$: 0.051 *+7−6*.
(2050 *32*)	4660	0.052‡ *6*	6.3 *1*	av Eβ=818 *15* $I\beta^-$: 0.052 *+3−9*.
(2090 *32*)	4620	0.066‡ *14*	6.2 *1*	av Eβ=836 *15* $I\beta^-$: 0.066 *+3−24*.
(2130 *32*)	4580	0.10‡ *3*	6.1 *2*	av Eβ=854 *15* $I\beta^-$: 0.098 *+21−38*.
(2170 *32*)	4540	0.15‡ *5*	5.9 *2*	av Eβ=873 *15* $I\beta^-$: 0.153 *+60−46*.
(2210 *32*)	4500	0.25‡ *9*	5.7 *2*	av Eβ=891 *15* $I\beta^-$: 0.25 *+12−5*.
(2250 *32*)	4460	0.42‡ *11*	5.6 *1*	av Eβ=910 *15* $I\beta^-$: 0.42 *+15−7*.
(2290 *32*)	4420	0.63‡ *8*	5.4 *1*	av Eβ=928 *15* $I\beta^-$: 0.626 *+81−77*.
(2330 *32*)	4380	0.74‡ *6*	5.4 *1*	av Eβ=947 *15* $I\beta^-$: 0.743 *+67−43*.
(2370 *32*)	4340	0.70‡ *7*	5.4 *1*	av Eβ=966 *15* $I\beta^-$: 0.696 *+36−97*.
(2410 *32*)	4300	0.56‡ *7*	5.5 *1*	av Eβ=984 *15* $I\beta^-$: 0.564 *+51−80*.
(2450 *32*)	4260	0.44‡ *5*	5.7 *1*	av Eβ=1003 *15* $I\beta^-$: 0.442 *+57−42*.
(2490 *32*)	4220	0.36‡ *3*	5.8 *1*	av Eβ=1021 *15* $I\beta^-$: 0.360 *+48−11*.
(2530 *32*)	4180	0.32‡ *3*	5.9 *1*	av Eβ=1040 *15* $I\beta^-$: 0.324 *+46−15*.
(2570 *32*)	4140	0.34‡ *3*	5.9 *1*	av Eβ=1059 *15*

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^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^- †#	Log *ft*	Comments
				Iβ^-: 0.336 *+45−15*.
(2610 *32*)	4100	0.42‡ *6*	5.8 *1*	av Eβ=1078 *15* Iβ^-: 0.415 *+73−41*.
(2650 *32*)	4060	0.58‡ *10*	5.7 *1*	av Eβ=1096 *15* Iβ^-: 0.58 *10*.
(2690 *32*)	4020	0.84‡ *12*	5.6 *1*	av Eβ=1115 *15* Iβ^-: 0.84 *+9−15*.
(2730 *32*)	3980	1.06‡ *9*	5.5 *1*	av Eβ=1134 *15* Iβ^-: 1.06 *+6−11*.
(2770 *32*)	3940	0.98‡ *17*	5.6 *1*	av Eβ=1153 *15* Iβ^-: 0.98 *+20−15*.
(2810 *32*)	3900	0.63‡ *16*	5.8 *1*	av Eβ=1172 *15* Iβ^-: 0.63 *+20−13*.
(2850 *32*)	3860	0.35‡ *10*	6.1 *1*	av Eβ=1190 *15* Iβ^-: 0.35 *+14−5*.
(2890 *32*)	3820	0.26‡ *8*	6.2 *2*	av Eβ=1209 *15* Iβ^-: 0.26 *+5−11*.
(2930 *32*)	3780	0.38‡ *19*	6.1 *2*	av Eβ=1228 *15* Iβ^-: 0.38 *+21−17*.
(2970 *32*)	3740	1.0‡ *5*	5.7 *2*	av Eβ=1247 *15* Iβ^-: 0.97 *+55−37*.
(3010 *32*)	3700	2.3‡ *6*	5.3 *1*	av Eβ=1266 *15* Iβ^-: 2.34 *+60−53*.
(3063 *25*)	3647.3	0.5 *2*	6.0 *2*	av Eβ=1291 *12* Iβ^-: 2.94 *+53−46* (2019Gu20 and priv. comm.) for 3660.
(3084 *25*)	3626.5	0.9 *2*	5.8 *1*	av Eβ=1301 *12* Iβ^-: 1.77 *+68−53* (2019Gu20 and priv. comm.) for 3620.
(3130 *32*)	3580	0.78‡ *34*	5.9 *2*	av Eβ=1323 *15* Iβ^-: 0.78 *+41−26*.
(3170 *32*)	3540	0.44‡ *13*	6.2 *1*	av Eβ=1341 *15* Iβ^-: 0.44 *+12−14*.
(3210 *32*)	3500	0.39‡ *4*	6.2 *1*	av Eβ=1360 *15* Iβ^-: 0.388 *+17−46*.
(3250 *32*)	3460	0.48‡ *8*	6.2 *1*	av Eβ=1379 *15* Iβ^-: 0.481 *+90−73*.
(3290 *32*)	3420	0.61‡ *12*	6.1 *1*	av Eβ=1398 *15* Iβ^-: 0.61 *+18−7*.
(3330 *32*)	3380	0.64‡ *7*	6.1 *1*	av Eβ=1417 *15* Iβ^-: 0.644 *+77−58*.
(3370 *32*)	3340	0.58‡ *6*	6.2 *1*	av Eβ=1436 *15* Iβ^-: 0.578 *+63−59*.
(3410 *32*)	3300	0.50‡ *7*	6.2 *1*	av Eβ=1455 *15* Iβ^-: 0.496 *+48−93*.
(3450 *32*)	3260	0.44‡ *5*	6.3 *1*	av Eβ=1474 *15* Iβ^-: 0.439 *+21−73*.
(3490 *32*)	3220	0.41‡ *6*	6.4 *1*	av Eβ=1493 *15* Iβ^-: 0.405 *+16−85*.
(3530 *32*)	3180	0.38‡ *9*	6.4 *1*	av Eβ=1512 *15* Iβ^-: 0.375 *+80−90*.
(3570 *32*)	3140	0.34‡ *9*	6.5 *1*	av Eβ=1531 *15* Iβ^-: 0.342 *+82−89*.

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^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^- [†#]	Log *ft*	Comments
(3610 *32*)	3100	0.32[‡] *6*	6.5 *1*	av Eβ=1550 *15* Iβ^-: 0.315 +*39*−*75*.
(3650 *32*)	3060	0.32[‡] *5*	6.6 *1*	av Eβ=1569 *15* Iβ^-: 0.315 +*25*−*64*.
(3690 *32*)	3020	0.33[‡] *4*	6.6 *1*	av Eβ=1588 *15* Iβ^-: 0.330 +*23*−*62*.
(3730 *32*)	2980	0.35[‡] *6*	6.6 *1*	av Eβ=1608 *15* Iβ^-: 0.351 +*22*−*9*.
(3770 *32*)	2940	0.36[‡] *9*	6.6 *1*	av Eβ=1627 *15* Iβ^-: 0.36 +*4*−*14*.
(3810 *32*)	2900	0.30[‡] *16*	6.7 *3*	av Eβ=1646 *15* Iβ^-: 0.30 +*14*−*17*.
(3850 *32*)	2860	0.19[‡] *11*	6.9 *3*	av Eβ=1665 *15* Iβ^-: 0.19 +*9*−*12*.
(3890 *32*)	2820	0.11[‡] *5*	7.1 *2*	av Eβ=1684 *15* Iβ^-: 0.110 +*40*−*57*.
(3930 *32*)	2780	0.12[‡] *5*	7.1 *2*	av Eβ=1703 *15* Iβ^-: 0.115 +*44*−*57*.
(3970 *32*)	2740	0.34[‡] *24*	6.7 *3*	av Eβ=1722 *15* Iβ^-: 0.34 +*28*−*19*.
(4010 *32*)	2700	1.9[‡] *11*	6.0 *3*	av Eβ=1741 *15* Iβ^-: 1.9 +*13*−*9*.
(4057 *25*)	2652.89	5.2 *7*	5.5 *1*	av Eβ=1764 *12* Iβ^-: 6.9 +*12*−*21* (2019Gu20 and priv. comm.) for 2660.
(4146 *25*)	2564.23	12.3 *11*	5.2 *1*	av Eβ=1806 *12* Iβ^-: 1.71 +*25*−*88* for 2540 *20*, 3.2 +*15*−*10* for 2580 *20* and 7.6 *16* for 2620 *20* (2019Gu20 and priv. comm., TAGS data) adds to 12.5 *21*, which seems to agree with 14.1 *13* for 2564 level, although, TAGS data suggests different levels in the vicinity of 2540 and 2640 keV excitation energy.
(4210 *32*)	2500	2.9[‡] *11*	5.9 *2*	av Eβ=1837 *15* Iβ^-: 2.9 +*11*−*10*.
(4250 *32*)	2460	8.2[‡] *21*	5.4 *1*	av Eβ=1856 *15* Iβ^-: 8.2 +*19*−*23*.
(4293 *25*)	2416.56	10.3 *23*	5.4 *1*	av Eβ=1877 *12* Iβ^-: from 10.3 +*9*−*37* (2019Gu20 and priv. comm., TAGS data) for 2420. From γ-transition intensity balance, evaluators obtain Iβ=24% *3*, implying that ≈14% apparent β feeding to this level is due to unobserved γ rays to this level from higher levels.
(4330 *32*)	2380	4.8[‡] *25*	5.7 *2*	av Eβ=1894 *15* Iβ^-: 4.8 +*18*−*31*.
(4400 *25*)	2310.13	3.7 *11*	5.9 *1*	av Eβ=1927 *12* Iβ^-: from 3.7 +*18*−*6* (2019Gu20 and priv. comm., TAGS data) for 2310. From γ-transition intensity balance, evaluators obtain Iβ=8.3% *11*, implying that 4.6% *16* apparent β feeding to this level is due to unobserved γ rays to this level from higher levels.
(4421 *25*)	2289.1	1.4 *4*	6.3 *1*	av Eβ=1938 *12* Iβ^-: 3.7 +*22*−*4* (2019Gu20 and priv. comm.).
(4520[@] *25*)	(2189.56)	1.0[‡] *10*	6.5 *5*	av Eβ=1985 *12* Iβ^-: 1.0 +*11*−*9* (2019Gu20 and priv. comm.).
(4607 *25*)	2103.07	12.5 *19*	5.4 *1*	av Eβ=2027 *12* Iβ^-: 13.2 +*18*−*12* (2019Gu20 and priv. comm.).
(4863 *25*)	1847.16	3.6 *7*	6.1 *1*	av Eβ=2149 *12* Iβ^-: 1.89 +*37*−*41* (2019Gu20 and priv. comm.).

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^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^- †#	Log *ft*	Comments
(4939 *25*)	1771.46	3.3 *10*	6.1 *2*	av Eβ=2186 *12* Iβ^-: 1.18 *+34−15* (2019Gu20 and priv. comm.).
(5103@ *25*)	1607.25			av Eβ=2264 *12* Iβ=1.5 *13*, almost consistent with zero feeding, as expected for ΔJ=(2), $\Delta\pi$=no β transition.
(5574 *25*)	1136.15	10 *6*	5.9 *3*	av Eβ=2490 *12* Iβ^-: 0.0 *+13−0* (2019Gu20 and priv. comm.).

† For discrete levels, β feedings are from transition-intensity balances. All the values for pseudolevels above 3150 are from TAGS data (2019Gu20 and priv. comm.). The β feeding of 43.2 *38* from TAGS data for levels in ^{100}Mo above 2350 keV is not connected with the observed γ-ray data. However, based on TAGS data in 2019Gu20, 17% *3* apparent β feeding to the 2416.6-keV level, and 4.6% *16* to the 2310.1-keV level from γ-ray data is in excess which seems contributed by unobserved γ-rays from higher levels. This 21.6 *34%* feeding probably gets distributed among the pseudolevels above 2350 keV. This analysis suggests that net total of 21.6% *51* from TAGS data is not accounted for by the γ-ray data.

‡ From TAGS data (2019Gu20 and priv. comm.). The uncertainties are systematic which dominate the statistical uncertainties. The latter were also provided by the authors of 2019Gu20, but as all these were negligible as compared to the systematic uncertainties listed here.

Absolute intensity per 100 decays.

@ Existence of this branch is questionable.

γ(^{100}Mo)

Iγ normalization: From Σ(I(γ+ce)(536γ+695γ+1063γ))=78.4 *51*, considering that 21.6% *51* of β feeding from TAGS data is not included in the γ-ray data and assuming no g.s. feeding. Other: 0.74 *7* if only the γ rays belonging to 2.99-s isomer decay are chosen for γ-normalization, i.e. Σ(I(γ+ce)(461γ+543γ+600γ+639γ+708γ+952γ+1071γ))=78.4 *51*.

2012Ro01 list two γ rays of 1022.5 and 1501.9 keV with intensities of 4.0 *6* and 5.9 *10*, respectively assigned to the decay of the isomeric activity, but both these γ rays deexcite 0$^+$ levels, thus are not expected to be populated by the decay of the (5$^+$) isomer. These are omitted here.

E_γ[†]	I_γ[‡&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[@]	α[a]	Comments
159.5 *1*	3.8 *5*	695.18	0$^+$	535.666	2$^+$	E2		0.222	α(K)=0.188 *3*; α(L)=0.0286 *5*; α(M)=0.00516 *8*; α(N+..)=0.000775 *12* α(N)=0.000746 *11*; α(O)=2.86$\times10^{-5}$ *5* E_γ: 159.5 *1* (1987Me06), 159.6 *2* (2001Su11). I_γ: I(γ+ce)=6.7 *11* (1987Me06). Iγ=14.3 *11* (2012Ro01).
^{x}234.5 *7*	1.4 *4*								Broad peak in coincidence with 535γ and 600γ, and weakly in coincidence with 471γ and 1046γ. Intensity is based on its possible placement above the 1136 level.
461.2 *2*	8.2 *5*	2564.23	(4)$^+$	2103.07	4$^+$				E_γ: 461.1 *2* (2001Su11), 461.3 *3* (1987Me06). I_γ: 4.2 *8* (2012Ro01), 6.6 *8* (1987Me06).
471.2 *3*	1.0 *4*	1607.25	(3$^+$)	1136.15	4$^+$				
495.4[b] *9*	0.6 *4*	2103.07	4$^+$	1607.25	(3$^+$)				
528.263[#] *18*	10.4 *13*	1063.930	2$^+$	535.666	2$^+$	E2+M1	+4.4 *+15−9*	0.00400	α(K)=0.00350 *6*; α(L)=0.000416 *7*; α(M)=7.45$\times10^{-5}$ *12*; α(N+..)=1.180$\times10^{-5}$ *18* α(N)=1.121$\times10^{-5}$ *17*; α(O)=5.91$\times10^{-7}$ *9* E_γ: others: 528.0 *2* (2001Su11), 528.3 *1* (1987Me06) from Ge detector. I_γ: 14.0 *12* (2012Ro01), 9.0 *17* (1987Me06).
535.666[#] *14*	100	535.666	2$^+$	0.0	0$^+$	E2		0.00388	α(K)=0.00339 *5*; α(L)=0.000403 *6*; α(M)=7.21$\times10^{-5}$ *10*; α(N+..)=1.143$\times10^{-5}$ *16* α(N)=1.085$\times10^{-5}$ *16*; α(O)=5.72$\times10^{-7}$ *8* E_γ: others: 535.4 *2* (2001Su11), 535.7 *1* (1987Me06) from Ge detector. I_γ: 100 *5* (2012Ro01), 100.0 *23* (1987Me06).
538.6 *4*	1.5 *5*	2310.13	(4$^+$)	1771.46	(4$^+$)				
543.2 *2*	5.5 *8*	1607.25	(3$^+$)	1063.930	2$^+$				E_γ: 543.5 *3* (2001Su11), 543.0 *2* (1987Me06). I_γ: 2.6 *5* (2012Ro01), 6.5 *14* (1987Me06).
549.7 *3*	2.0 *4*	2652.89	(4$^+$,5$^+$)	2103.07	4$^+$				
600.5 *1*	73 *6*	1136.15	4$^+$	535.666	2$^+$	(E2)		0.00280	α(K)=0.00246 *4*; α(L)=0.000289 *4*; α(M)=5.17$\times10^{-5}$ *8*; α(N+..)=8.21$\times10^{-6}$ *12*

$\gamma(^{100}$Mo) (continued)

E_γ[†]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	α[a]	$I_{(\gamma+ce)}$[&]	Comments
										α(N)=7.79×10^{-6} *11*; α(O)=4.16×10^{-7} *6* E_γ: 600.5 *1* (1987Me06), 600.3 *2* (2001Su11). I_γ: 37.4 *31* (2012Ro01), 67.0 *17* (1987Me06).
635.4 *3*	3.5 *5*	1771.46	(4$^+$)	1136.15	4$^+$					E_γ: 635.3 *3* (2001Su11), 635.7 *4* (1987Me06). I_γ: 4.6 *18* (1987Me06).
639.0 *3*	3.8 *5*	2103.07	4$^+$	1464.04	2$^+$					E_γ: 639.1 *3* (2001Su11), 638.7 *4* (1987Me06). I_γ: 7.2 *18* (1987Me06).
681.8 *4*	1.9 *4*	2289.1	(4,5$^+$)	1607.25	(3$^+$)					
695.0		695.18	0$^+$	0.0	0$^+$	E0			0.82 *16*	$I_{(\gamma+ce)}$: using branching for 695 transition from Adopted Gammas.
702.7 *3*	5.6 *8*	2310.13	(4$^+$)	1607.25	(3$^+$)					
707.5 *2*	6.6 *9*	1771.46	(4$^+$)	1063.930	2$^+$	(E2)		0.00180		α(K)=0.001579 *23*; α(L)=0.000183 *3*; α(M)=3.27×10^{-5} *5*; α(N+..)=5.22×10^{-6} *8* α(N)=4.95×10^{-6} *7*; α(O)=2.69×10^{-7} *4* E_γ: 707.5 *2* (2001Su11), 707.6 *5* (1987Me06). I_γ: 4.7 *17* (1987Me06).
711.0 *2*	6.8 *7*	1847.16	6$^+$	1136.15	4$^+$	(E2)		1.78×10^{-3}		α(K)=0.001559 *22*; α(L)=0.000181 *3*; α(M)=3.23×10^{-5} *5*; α(N+..)=5.15×10^{-6} *8* α(N)=4.89×10^{-6} *7*; α(O)=2.66×10^{-7} *4* E_γ: 711.0 *2* (2001Su11), 710.8 *4* (1987Me06). I_γ: 5.3 *14* (1987Me06).
768.8 *2*	5.2 *5*	1464.04	2$^+$	695.18	0$^+$	E2		1.45×10^{-3}		α(K)=0.001277 *18*; α(L)=0.0001473 *21*; α(M)=2.63×10^{-5} *4*; α(N+..)=4.20×10^{-6} *6* α(N)=3.98×10^{-6} *6*; α(O)=2.18×10^{-7} *3* E_γ: 768.7 *2* (2001Su11), 768.9 *2* (1987Me06). I_γ: 4.6 *10* (2012Ro01), 9.1 *19* (1987Me06).
792.8 *2*	4.2 *6*	2564.23	(4)$^+$	1771.46	(4$^+$)					I_γ: 1.7 *4* (2012Ro01).
928.4 *2*	3.7 *4*	1464.04	2$^+$	535.666	2$^+$	M1+E2	−0.27 *2*	9.42×10^{-4}		α(K)=0.000830 *12*; α(L)=9.28×10^{-5} *13*; α(M)=1.655×10^{-5} *24*; α(N+..)=2.67×10^{-6} *4* α(N)=2.52×10^{-6} *4*; α(O)=1.446×10^{-7} *21* E_γ: 928.2 *2* (2001Su11), 928.5 *2* (1987Me06). I_γ: 5.3 *6* (2012Ro01), 7.3 *20* (1987Me06).
952.5 *3*	4.9 *6*	2416.56	(4$^+$)	1464.04	2$^+$					E_γ: 952.5 *3* (2001Su11), 952.4 *6* (1987Me06). I_γ: 2.1 *4* (2012Ro01), 4.6 *32* (1987Me06).
966.9 *2*	17.3 *19*	2103.07	4$^+$	1136.15	4$^+$					E_γ: 967.0 *2* (2001Su11), 966.5 *4* (1987Me06). I_γ: 10.8 *12* (2012Ro01), 19.9 *17* (1987Me06).
1045.8 *6*	1.0 *4*	2652.89	(4$^+$,5$^+$)	1607.25	(3$^+$)					
1063.7 *2*	4.4 *9*	1063.930	2$^+$	0.0	0$^+$	E2		6.72×10^{-4}		α(K)=0.000591 *9*; α(L)=6.68×10^{-5} *10*;

$^{100}_{42}$Mo$_{58}$-8

$\gamma(^{100}$Mo) (continued)

E_γ[†]	I_γ[‡&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[@]	α[a]	Comments
									α(M)=1.192×10^{-5} *17*; α(N+..)=1.91×10^{-6} *3* α(N)=1.81×10^{-6} *3*; α(O)=1.015×10^{-7} *15* E_γ: 1063.5 *3* (2001Su11), 1063.9 *2* (1987Me06). I_γ: 8.0 *12* (2012Ro01), 5.2 *10* (1987Me06).
1071.6 *3*	3.8 *7*	1607.25	(3$^+$)	535.666	2$^+$				E_γ: 1071.7 *3* (2001Su11), 1071.5 *3* (1987Me06). I_γ: 1.8 *3* (2012Ro01), 5.9 *13* (1987Me06).
1246.4 *3*	2.7 *4*	2310.13	(4$^+$)	1063.930	2$^+$				I_γ: 2.9 *7* (2012Ro01).
1280.4 *2*	23.5 *25*	2416.56	(4$^+$)	1136.15	4$^+$	(M1+E2)	−0.7 *+10−13*	4.86×10^{-4} *13*	α(K)=0.000412 *13*; α(L)=4.58×10^{-5} *12*; α(M)=8.17×10^{-6} *22*; α(N+..)=2.05×10^{-5} *20* α(N)=1.25×10^{-6} *4*; α(O)=7.14×10^{-8} *25*; α(IPF)=1.92×10^{-5} *20* E_γ: 1280.3 *2* (2001Su11), 1280.6 *2* (1987Me06). I_γ: 11.2 *12* (2012Ro01), 24.5 *16* (1987Me06). Mult.,δ: deduced by the evaluator from (1280γ)(600γ)(θ): A_2=+0.23 *15*, A_4=−0.02 *26* (1987Me06). J^π=3$^-$ for 2416 level was also suggested by L(α,α')=3 but 3$^-$ choice gives δ(M2/E1)<−0.3, which seems too high to be realistic.
1427.9 *3*	4.2 *5*	2564.23	(4)$^+$	1136.15	4$^+$				
1516.8 *3*	4.0 *6*	2652.89	(4$^+$,5$^+$)	1136.15	4$^+$				I_γ: 1.6 *4* (2012Ro01).
1567.4 *3*	6.0 *9*	2103.07	4$^+$	535.666	2$^+$				I_γ: 3.3 *6* (2012Ro01).
1779.3 *5*	1.2 *3*	3626.5	(4$^+$,5,6)	1847.16	6$^+$				
1800.1 *6*	0.7 *3*	3647.3	(5$^-$)	1847.16	6$^+$				

† From weighted average of 2001Su11 and 1987Me06, unless otherwise stated. Values in column 1 of Table 1 in 2012Ro01 seem to have been taken from β^- decay datasets in 2008Si01 (A=100 NDS evaluation), although, in the text, the authors of 2012Ro01 seem to suggest that values given in their Table 1 are from their observations.

‡ From 2001Su11, unless otherwise stated. The values from 1987Me06 are in general agreement but are for a mixed source. The values from 2012Ro01 are not in agreement with those in 2001Su11 and 1987Me06. Since the separation of the g.s. and isomeric activity was not achieved well as shown by 'a' values in column 5 of Table 1 in 2012Ro01, these values are not considered here, and are listed only in comments. The coincidence information is from 2001Su11 and 1987Me06.

From measurement with a curved-crystal spectrometer (1979Bo26).

@ From the Adopted Gammas.

& For absolute intensity per 100 decays, multiply by 0.74 *5*.

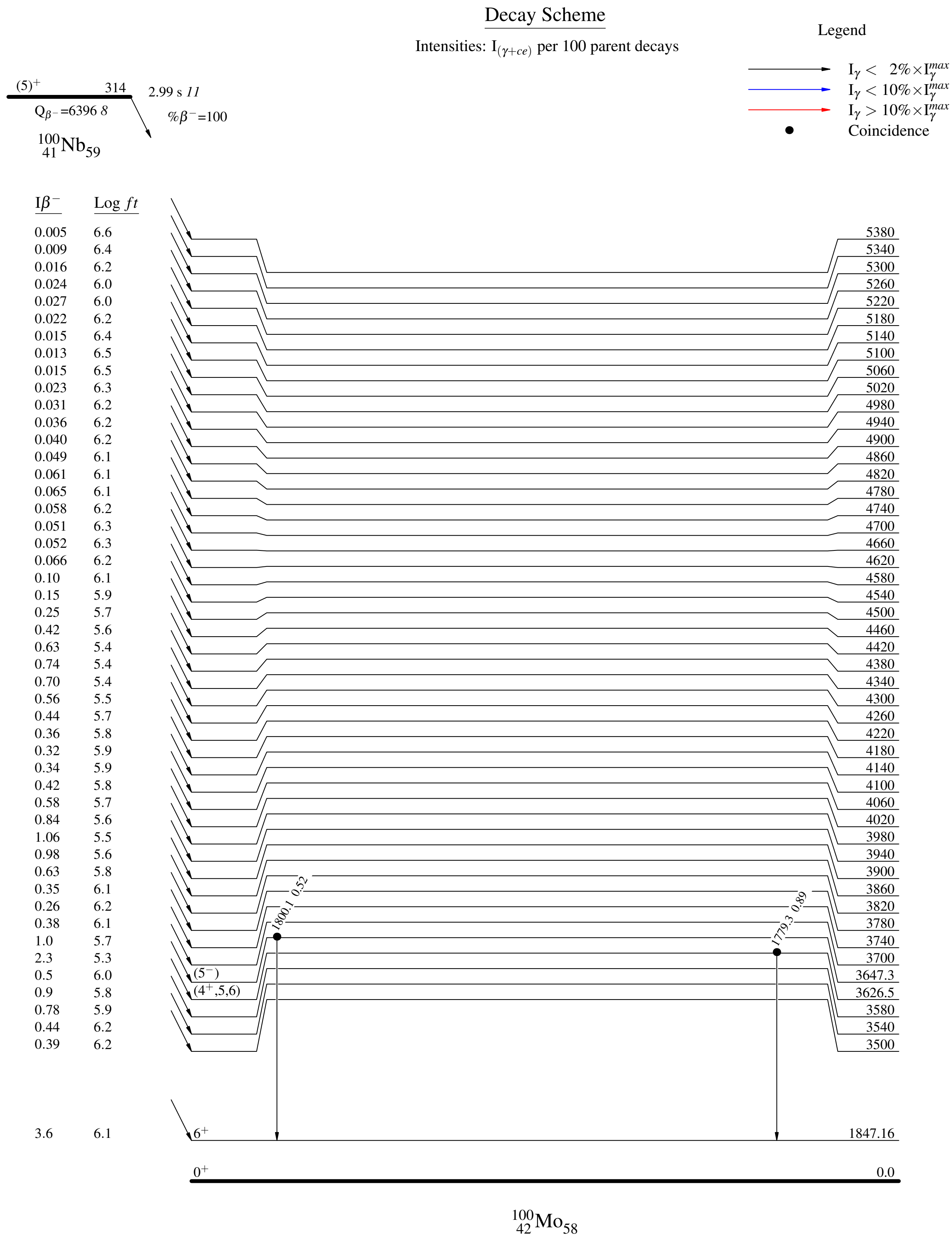
a Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

b Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

$^{100}_{42}Mo_{58}$-9

^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20



^{100}Nb β^- decay (2.99 s) 2001Su11,1987Me06,2019Gu20