^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Parent: ^{76}As: E=0.0; $J^\pi=2^-$; $T_{1/2}$=26.254 h *11*; Q(β^-)=2960.6 *9*; %β^- decay=100

^{76}As-J^π,$T_{1/2}$: From ^{76}As Adopted Levels.

^{76}As-Q(β^-): From 2021Wa16.

2000Ma57: measured precise emission probabilities of six γ rays, using $4\pi\beta\gamma$ coin method, and relative intensities of a total of 22 γ rays.

1998De26: measured Eγ, Iγ, $\gamma\gamma$-coin with Ge-Ge detector system. A total of 45 γ rays reported, all incorporated in a decay scheme with 14 excited states.

1982We14: measured Eγ, Iγ, $\gamma\gamma$-coin with Ge-Ge detector system. A total of 42 γ rays reported.

1980Ka36: measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$ with Ge(Li)-NaI(Tl) system. A total of 56 γ rays reported, 53 of which assigned in a level scheme with 19 levels.

1973Na04: measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$ with Ge(Li)-Ge(Li), and Ge(Li)-NaI(Tl) systems. A total of 44 γ rays reported, 43 of which incorporated amongst 16 levels.

1972Ar03: measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$. A total of 42 γ rays reported, all but one assigned in a level scheme of 16 levels.

1972Fu03, 1971Fu03: measured Eγ, Iγ, $\gamma\gamma$-coin.

Other studies:

$\gamma(\theta$,TEMP): 1987Su05, 1978Mo11, 1976Ba15.

$\gamma\gamma(\theta)$ (Ge-Ge system): 1989Za03.

$\gamma\gamma(\theta)$(Ge(Li)-NaI system): 1977CoZK and 1977CoZO, 1973Na04. Others (NaI-NaI system): 1960Gr07, 1958Fu62, 1958Co65, 1957Li35.

$\gamma\gamma(\theta$,H) (g factor): 1967Mu10.

$\beta\gamma(\theta)$: 1982JoZZ (1976JoZZ), 1972Kh02, 1965Ra03, 1964Ra06, 1963Gr37, 1963Fi01, 1961Pi05, 1960Sp02, 1960Sp01. Theory: 1970Ba45, 1970Ko20.

$\beta\gamma$(circ pol,θ): 1978Pr06, 1971Sm03, 1962De06.

$\beta\gamma$(lin pol,θ): 1953Ha40.

β^- data: 1971Mo25, 1971Mc18, 1969Na11, 1962Ku06, 1957Gr76, 1956Po07, 1955Co55, 1955Ku10, 1953Hu47, 1952To18 (spectral shape), 1949Ma03, 1943Ma11, 1942We01.

ce data: 1957Gr76, 1952To18.

Internal conversion (pair): 1963Ba30. Coefficients given for 1220, 1420, 1788, 1970, and 2060 γ rays. All these correspond to unresolved multiplets; therefore, no conclusion can be drawn about multipolarities.

$T_{1/2}$ and production of ^{76}As: 1972Em01, 1970Mc01, 1969Na11, 1968Da24, 1967Or04, 1966La22, 1957Wr37, 1955Dz48, 1953Hu47, 1948Ph08, 1943Ma11, 1942We01, 1940Mi04, 1935Am01.

Others (mainly γ, $\gamma\gamma$-coin): 1979Ch35, 1977CoZK, 1972MoZD, 1971Mo25, 1971Mc18, 1971Ii01, 1971Dz08, 1971McYH, 1971FuZP, 1969GuZV, 1967Mu10, 1967At05, 1966La22, 1964Vi03, 1962Ku06, 1960Ba13, 1960De09, 1960Cr06, 1959Gi45, 1958Bo72, 1958Gu14, 1957Ma16, 1957Ba04, 1957Gr76, 1957Wr37, 1955Dz48, 1955Ku10, 1955Dz48, 1953Ro10, 1953Hu47, 1952Hu02, 1949Ma03, 1948Ph08, 1943Ma11, 1940Mi04, 1935Am01.

List of references prior to 1960 may not be complete; however, no essential experimental information has been omitted.

^{76}Se Levels

Level scheme here is taken from 1998De26 which is based on numerous studies in the past. Differences between their level scheme and in others are discussed in γ-ray and level tables.

The following levels proposed by different groups of experimenters have been discarded by the evaluators for lack of confirmatory evidence: 1881, 2080, 2124, 2183, 2347, 2363 (from 1980Ka36); 2347, 2363 from 1973Na04 and 1980Ka36; 2448, 2527, 2542 (from 1972Fu03,1971Fu03); 2088, 2542 (from 1971Ii01); 2059, 2866 (from 1971Mc18); 1113.9, 1779.7, 2443.7, 2454.5 (from 1971Mo25). Gamma rays from these levels have either not been seen in other studies including 1998De26 or assigned elsewhere.

An 1881 level from 1980Ka36 and 1973Na04 is omitted since 665γ was not confirmed as a doublet, and 1881γ was not seen in 1998De26 (Iγ<0.0004). A 2346 level proposed by 1973Na04 and 1980Ka36 is omitted since the 466γ was not seen (Iγ<0.0052), and 1130γ doublet was not confirmed by 1998De26. Also omitted is a 2363 level from 1973Na04 and 1980Ka36 since 575γ was reassigned (based on $\gamma\gamma$-coin data) from 1791 level, and 1030γ and 1805γ were not seen by 1998De26 (Iγ<0.0008 for 1030γ,

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

^{76}Se Levels (continued)

Iγ<0.0004 for 1805γ).

E(level)†	Jπ‡	$T_{1/2}$‡	Comments
0.0	0^+		
559.100 *9*	2^+	11.98 ps *+16−40*	g=+0.40 *12* g-factor: (γγ(θ,H), 1967Mu10). $T_{1/2}$: other: 23 ps *15* from βγ(t) (1955Co55).
1122.257 *12*	0^+		
1216.153 *10*	2^+		
1330.855 *18*	4^+		
1689.003 *14*	3^+		
1787.648 *11*	2^+		
1791.457 *25*			E(level): level from 1998De26.
2026.03 *3*	4^+		
2127.23 *3*	$(2)^+$		
2170.67 *5*	(0^+)		
2429.146 *12*	3^-		
2514.63 *4*	2^+		
2655.347 *14*	1		
2669.875 *17*	2^-		

† From least-squares fit to Eγ data. With evaluators′ adjusted uncertainties, as listed in Eγ comment in γ table, reduced χ^2=1.8 is about the same as critical χ^2=1.7.
‡ From Adopted Levels. Values from this dataset are given under comments.

β^- radiations

av Eβ: Additional information 3.

E(decay)	E(level)	Iβ−†‡	Log *ft*	Comments
(290.7 *14*)	2669.875	0.477 *8*	6.595 *12*	av Eβ=84.41 *30*
(305.3 *14*)	2655.347	0.955 *15*	6.363 *11*	av Eβ=89.25 *30* E(β)=320 *30* from 1969Na11 (βγ data). This β^- component most likely feeds both levels at 2655 and 2670.
(446.0 *14*)	2514.63	0.0268 *5*	8.468 *11*	av Eβ=138.19 *32*
(531.5 *14*)	2429.146	1.52 *3*	6.978 *11*	av Eβ=169.63 *34* E(β)=540 *25* from 1969Na11 (βγ data). Iβ=3 (1969Na11).
(789.9 *14*)	2170.67	0.0013 *4*	11.06^{1u} *+16−12*	av Eβ=293.6 *4*
(934.6# *14*)	2026.03	0.0010 *10*	$\geq 11.3^{1u}$	av Eβ=352.3 *4*
(1169.1 *14*)	1791.457	0.0593 *14*	9.641 *12*	av Eβ=429.8 *4*
(1173.0 *14*)	1787.648	1.69 *3*	8.192 *9*	av Eβ=431.5 *4* E(β)=1184 *20* from 1969Na11 (βγ data). Iβ=3 (1969Na11).
(1271.6# *14*)	1689.003	0.011 *9*	10.5 *+7−3*	av Eβ=474.4 *4*
(1629.8 *14*)	1330.855	0.0596 *19*	11.132^{1u} *+16−15*	av Eβ=649.8 *4*
(1744.5 *14*)	1216.153	6.91 *14*	8.262 *10*	av Eβ=686.1 *4* E(β)=1785 *7* from 1969Na11 (βγ-coin data). Iβ=7 (1969Na11).
(1838.3 *14*)	1122.257	0.69 *3*	10.371^{1u} *+21−20*	av Eβ=742.7 *4*
(2401.5 *14*)	559.100	31.7 *3*	8.174 *5*	av Eβ=988.3 *4* Additional information 1. E(B)=2410 *4* from 1969Na11 (βγ-coin data). Iβ=31 (1969Na11).
(2960.6 *17*)	0.0	55.8 *3*	9.7003^{1u} *33*	av Eβ=1236.1 *4*

Continued on next page (footnotes at end of table)

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

β^- radiations (continued)

E(decay)	E(level)	Comments
		Additional information 2. EB=2970 *2* from 1969Na11. Iβ^-: from 100−Σ%I(β^- to excited states). Other: 51 *2* from average of 1969Na11, 1955Ku10, 1953Hu47, 1952To18; β spectra using magnetic spectrometers.

† From γ+ce intensity balance at each level.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$

Iγ normalization: From absolute intensity of 559γ=40.67 *29* (2000Ma57, using $\beta\gamma$ coin method). Other: 0.45 *2* deduced from Iβ=51 *2* to g.s. (from β measurements in 1969Na11, 1955Ku10, 1953Hu47 and 1952To18), and ce(K)/I(β^-)<0.0002 (1957Sc23). Others: 1963Ba30, 1954Mu22, 1951Mi16, 1949Ma03, 1948Wu02, 1947Ba08. For %ε<0.02 to 2^+ level in ^{76}Ge, log *ft*≥7.5.

The following γ rays reported in different studies have been omitted here for lack of sufficient evidence. 1998De26 give upper limits for some of these γ rays: Iγ<0.0052 for 466γ, <0.0007 for 640γ, <0.001 for 797γ, <0.0008 for 1031γ, <0.00006 for 1393γ, <0.0004 for 1805γ and 1881γ.

1982We14: Eγ(Iγ): 463.7(0.002), 602.5(0.002), 921.6(0.002),

1980Ka36: Eγ(Iγ): 467 (0.003), 640(0.008) from 2429 level, 754.9(0.001), 776.5(0.002), 797.0(0.004) from 2127 level, 852.8(0.005), 857.0(0.002), 907.5(0.004), 957.6(0.004), 1031(0.002), 1060.6(0.004), 1564.3(0.003), 1881.3(0.002) from 1881 level.

1973Na04: Eγ(Iγ): 466(0.018) from 2347 level, 1029(0.003) from 2363 level, 1130(0.04) from 2347 level, 1805(0.003) from 2363 level.

1972Ar03: Eγ: 1393 from 2514 level.

1971Mo25: Eγ(Iγ): 448.2(0.05), 530.1(0.05), 543.2(0.05), 554.5(3.6), 641.4(0.07), 654.5(0.52), 675.8(0.04), 733.6(0.06), 765.6(0.08), 780.4(0.04), 847.9(0.09), 850.8(0.10), 908.9(0.10), 1094.4(0.15), 1097.1(0.13), 1112.4(0.06), 1122.0(0.07), 1204.2 (0.10), 1219.8(0.21), 1238.3(0.15), 1325.1(0.07), 1330.8(0.06), 1542.8(0.08), 1689.4(0.08), 1778.2(0.05), 1792.8(0.60), 1884.2(0.04), 2443.7(0.07), 2517.8(0.09).

1971Mc18: Eγ: 1177, 1550, 1585, 1743, 2306.

1971Ii01: Eγ: 546.0, 1051.0, 1907.5, 2173.2, 2370.1.

Eγ from others: 1117.2 (1971Fu03); 1583.2 (1967At05); 1074.4, 1089.9 (1965Wh01); 624, 708, 820, 972 (1964Vi03).

E$_\gamma$[‡]	I$_\gamma$[#b]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[&]	δ[&]	α[†]	Comments
301.96 *5*	0.0214 *9*	2429.146	3$^-$	2127.23	(2)$^+$				%Iγ=0.0087 *4* Additional information 16.
358.21 *6*	0.0112 *4*	1689.003	3$^+$	1330.855	4$^+$				%Iγ=0.00456 *17*
403.094 *50*	0.059 *2*	2429.146	3$^-$	2026.03	4$^+$				%Iγ=0.0240 *8* Additional information 17. I$_\gamma$: 0.59 in 1998De26 seems a misprint.
438.290 *50*	0.0081 *3*	2127.23	(2)$^+$	1689.003	3$^+$				%Iγ=0.00329 *13* Additional information 15.
456.777 *50*	0.081 *2*	1787.648	2$^+$	1330.855	4$^+$				%Iγ=0.0329 *9* Additional information 7.
472.838 *20*	0.111 *4*	1689.003	3$^+$	1216.153	2$^+$	M1+E2	+3.20 *+27−24*	0.0026 *7*	α(K)=0.0023 *6*; α(L)=2.5×10^{-4} *6*; α(M)=3.9×10^{-5} *10* α(N)=3.3×10^{-6} *8* %Iγ=0.0451 *17* Additional information 5. 473$\gamma(\theta)$: A$_2$=−0.28 *44* (1987Su05). δ: values from this dataset: +0.01 to +0.73,>+2.5 or<−6.7 (1987Su05).
484.69 *5*	0.0148 *5*	2655.347	1	2170.67	(0$^+$)				%Iγ=0.00602 *21* Additional information 24.

$^{76}_{34}Se_{42}$-4

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$ (continued)

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
528.15[a] *6*	0.0077 *3*	2655.347	1	2127.23	$(2)^+$				%Iγ=0.00313 *13*
559.086 *10*	100[@]	559.100	2^+	0.0	0^+	E2		1.97×10^{-3} *3*	%Iγ=40.67 *29* α(K)exp=0.0018 *3* (1957Gr76); α(K)exp=0.0020 *2* (1952To18) α(K)=0.001748 *24*; α(L)=0.0001872 *26*; α(M)=2.91×10^{-5} *4* α(N)=2.452×10^{-6} *34* E_γ: uncertainty=0.002 keV (1998De26). I_γ: measured Iγ/100 decays=40.67 *29* (2000Ma57, $\beta\gamma$ coin method). 559$\gamma(\theta)$: A_2=−0.472 *8*, A_4=−0.75 *6* (1976Ba15). I_γ: 1957Ma16 give absolute intensity as 0.446 per decay, which is most likely the value for all γ rays near 559, i.e. 559, 563, 571 and 575.
563.147 *10*	2.69[@] *6*	1122.257	0^+	559.100	2^+	E2		1.92×10^{-3} *3*	α(K)=0.001711 *24*; α(L)=0.0001832 *26*; α(M)=2.85×10^{-5} *4* α(N)=2.400×10^{-6} *34* %Iγ=1.094 *26* E_γ: uncertainty=0.002 keV (1998De26). I_γ: measured Iγ/100 decays=1.108 *43* (2000Ma57, $\beta\gamma$ coin method). (563G)(559G)(θ): A2=+0.23 6, A4=1.11 10 (1989Za03). (563G)(559G)(θ): A2=+0.26 9, A4=1.15 15 (1980Ka36); A2=+0.34 3, A4=+0.96 4 (1977CoZK); A2=+0.25 5, A4=1.09 9 (1973Na04). 563$\gamma(\theta)$: A_2=−0.046 *54* (1976Ba15).
571.478 *20*	0.306[@] *5*	1787.648	2^+	1216.153	2^+	(M1(+E2))	+0.13 *12*		%Iγ=0.1245 *22* Additional information 8. (572γ)(1216γ)(θ): A_2=+0.145 *22*, A_4=+0.05 *3* (1989Za03). (572γ)(657γ)(θ): A_2=+0.04 *7*, A_4=+0.1 *1* (1977CoZK). 572$\gamma(\theta)$: A_2=−0.25 *40* (1987Su05). δ: >+1.37 or −0.13 *34* (1987Su05), +0.13 *12* (1989Za03).
575.28 *3*	0.148[@] *3*	1791.457		1216.153	2^+				%Iγ=0.0602 *13* E_γ: placement from 1998De26; earlier placement from 2363 level was rejected based on $\gamma\gamma$-coin data. 575$\gamma(\theta)$: A_2=+0.16 *15* (for 2^+ to 2^+); 0.20 *18* (for 3^+ to 2^+) (1987Su05). (575γ)(1228γ)(θ): A_2=+0.35 *3*, A_4=+0.01 *5* (1989Za03). δ: for 2^+ to 2^+; δ=−0.48 *15*,>+10 or<−6. For 3^+ to 2^+; δ=+0.07 *10* or −3.7 to −13.8 (1987Su05). δ=−1.18 *35* (1989Za03).

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$ (continued)

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
									δ: for 2^+ to 2^+; δ=−0.48 *15*,>+10 or<−6. For 3^+ to 2^+; δ=+0.07 *10* or −3.7 to −13.8 (1987Su05). δ=−1.18 *35* (1989Za03).
657.042 *10*	14.0[@] *3*	1216.153	2^+	559.100	2^+	E2+M1(+E0)	+5.2 *2*	1.23×10^{-3} *2*	α(K)=0.001090 *15*; α(L)=0.0001159 *16*; α(M)=1.802×10^{-5} *25* α(N)=1.524×10^{-6} *21* %Iγ=5.69 *13* E_γ: uncertainty=0.003 keV (1998De26). I_γ: measured Iγ/100 decays=5.550 *31* (2000Ma57, $\beta\gamma$ coin method). (657γ)(559γ)(θ): A_2=−0.225 *15*, A_4=+0.31 *3* (1989Za03). (657γ)(559γ)(θ): A_2=−0.22 *2*, A_4=+0.28 *1* (1980Ka36); A_2=−0.20 *2*, A_4=+0.29 *3* (1977CoZK); A_2=−0.18 *2*, A_4=+0.30 *2* (1973Na04). 657γ(θ): A_2=−0.182 *16* (1987Su05); A_2=−0.111 *9*, A_4=−0.40 *26* (1976Ba15). δ: +5.2 *2* (1976Ba15), +4.15 *20* (1987Su05), +5.3 *5* (1989Za03).
665.358 *20*	0.94[@] *1*	1787.648	2^+	1122.257	0^+				%Iγ=0.382 *5* Additional information 9. 665γ(θ): A_2=−0.65 *10* (1987Su05). (665γ)[563γ](559γ)(θ): A_2=−0.013 *6*, A_4=+0.046 *10* (1989Za03).
695.17 *5*	0.0193 *8*	2026.03	4^+	1330.855	4^+				%Iγ=0.00785 *33* Additional information 13.
727.003 *50*	0.043 *1*	2514.63	2^+	1787.648	2^+				%Iγ=0.0175 *4* Additional information 22. 727γ(θ): A_2=−1.4 *6* (1987Su05). δ: >+3.0 or<−0.10 (1987Su05).
740.132 *20*	0.264[@] *4*	2429.146	3^-	1689.003	3^+	(E1+M2)	−0.21 *12*		%Iγ=0.1074 *18* Additional information 18. 740γ(θ): A_2=−0.49 *13* (1987Su05), −0.20 *12* (1976Ba15). (740γ)[1130γ](559γ)(θ): A_2=+0.143 *20*, A_4=−0.03 *3* (1989Za03). δ: from 1989Za03. Other: +0.08 *16* (1987Su05).
771.762 *20*	0.265[@] *4*	1330.855	4^+	559.100	2^+	E2		0.000800 *11*	α(K)=0.000712 *10*; α(L)=7.52×10^{-5} *11*; α(M)=1.170×10^{-5} *16*

$^{76}_{34}Se_{42}$-6

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$ (continued)

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
									α(N)=9.93×10^{-7} *14* %Iγ=0.1078 *18* Additional information 4. (772γ)(559γ)(θ): A_2=+0.105 *19*, A_4=−0.01 *3* (1989Za03). δ(M3/E2)<+0.02 (1989Za03).
809.85 *5*	0.0410 *9*	2026.03	4$^+$	1216.153	2$^+$				%Iγ=0.0167 *4* Additional information 14.
863.88 *5*	0.0224 *8*	2655.347	1	1791.457					%Iγ=0.00911 *33* Additional information 25. Placement from 1998De26.
867.701 *20*	0.298[@] *5*	2655.347	1	1787.648	2$^+$	D(+Q)	+0.013 *20*		%Iγ=0.1212 *22* Additional information 26. 868γ(θ): A_2=+0.42 *26* (1987Su05). (868γ)(1228γ)(θ): A_2=+0.133 *23*, A_4=0.00 *4* (1989Za03). (868γ)[1228γ](559γ)(θ): A_2=−0.095 *18*, A_4=−0.016 *27* (1989Za03). δ: values from this dataset: +0.4 *+6−3* (1987Su05), +0.08 *7* (1989Za03).
882.212 *20*	0.122[@] *9*	2669.875	2$^-$	1787.648	2$^+$	(E1)			%Iγ=0.050 *4* Additional information 30. 882γ(θ): A_2=−0.5 *4* (1987Su05). (882γ)(1228γ)(θ): A_2=0.00 *3*, A_4=0.00 *6* (1989Za03). (882γ)[1228γ](559γ)(θ): A_2=+0.010 *25*, A_4=−0.08 *4* (1989Za03). δ: δ(Q/D)=+0.26 *15* from 1989Za03. Other:<+5.3 or>−0.24 (1987Su05).
954.7 *2*	0.0021 *3*	2170.67	(0$^+$)	1216.153	2$^+$				%Iγ=8.5×10^{-4} *12*
980.921 *50*	0.095[@] *6*	2669.875	2$^-$	1689.003	3$^+$	(E1)			%Iγ=0.0386 *25* Additional information 31. 981γ(θ): A_2=−0.3 *7* (1987Su05). δ: >+16.4 or<+0.24 (1987Su05).
1098.323 *50*	0.0071 *5*	2429.146	3$^-$	1330.855	4$^+$				%Iγ=0.00289 *21* Additional information 19.
1129.909 *20*	0.271[@] *20*	1689.003	3$^+$	559.100	2$^+$	M1+E2	+1.08 *10*	0.000309 *4*	α(K)=0.000275 *4*; α(L)=2.85×10^{-5} *4*; α(M)=4.44×10^{-6} *6* α(N)=3.80×10^{-7} *5*; α(IPF)=1.575×10^{-6} *33* %Iγ=0.110 *8* Additional information 6. 1130γ(θ): A_2=−0.73 *15* (1987Su05). δ: from (1130γ)(559γ)(θ): A_2=+0.240 *19*, A_4=−0.06 *3* (1989Za03). δ: +0.57 to +3.55 (1987Su05), +1.08 *10* (1989Za03).
1212.986 *10*	3.18[@] *6*	2429.146	3$^-$	1216.153	2$^+$	(E1+M2)	+0.025 *20*		%Iγ=1.293 *26*

$^{76}_{34}Se_{42}$-7

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$ (continued)

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
									Additional information 20. I_γ: measured Iγ/100 decays=1.296 *65* (2000Ma57, $\beta\gamma$ coin method). 1213$\gamma(\theta)$: A_2=+0.12 *17* (1987Su05). (1213γ)(657γ)(θ): A_2=−0.011 *8*, A_4=+0.020 *13* (1989Za03). (1213γ)(1216γ)(θ): A_2=−0.058 *8*, A_4=+0.13 *13* (1989Za03). (1213γ)[657γ](559γ)(θ): A_2=−0.051 *8*, A_4=+0.081 *12* (1989Za03). δ: +0.11 *10* (1987Su05), +0.025 *20* (1989Za03).
1216.200 *20*	7.60[@] *12*	1216.153	2^+	0.0	0^+	E2		0.000281 *4*	α(K)=0.0002408 *34*; α(L)=2.508×10^{-5} *35*; α(M)=3.90×10^{-6} *5* α(N)=3.33×10^{-7} *5*; α(IPF)=1.091×10^{-5} *15* %Iγ=3.09 *6* E_γ: uncertainty=0.004 keV (1998De26). I_γ: measured Iγ/100 decays=3.012 *88* (2000Ma57, $\beta\gamma$ coin method). (1213γ+1216γ)(θ): A_2=−0.311 *14*, A_4=−1.06 *33* (1976Ba15).
1228.589 *20*	2.65[@] *5*	1787.648	2^+	559.100	2^+	M1+E2	−0.51 *5*	0.000264 *4*	α(K)=0.0002259 *32*; α(L)=2.340×10^{-5} *33*; α(M)=3.64×10^{-6} *5* α(N)=3.12×10^{-7} *4*; α(IPF)=1.041×10^{-5} *18* %Iγ=1.078 *22* Additional information 10. I_γ: measured Iγ/100 decays=1.037 *31* (2000Ma57, $\beta\gamma$ coin method). δ: weighted average of results from $\gamma(\theta)$ and $\gamma\gamma(\theta)$. (1229γ)(559γ)(θ): A_2=+0.471 *7*, A_4=+0.097 *11* (1989Za03). 1229$\gamma(\theta)$: A_2=+0.21 *5* (1987Su05), 0.17 *4* (1976Ba15).
1232.40[a] *5*	0.0201 *5*	1791.457		559.100	2^+				%Iγ=0.00818 *21* Additional information 12.
1439.214 *20*	0.603[@] *10*	2655.347	1	1216.153	2^+	D+Q	−0.043 *19*		%Iγ=0.245 *5* Additional information 27. 1439$\gamma(\theta)$: A_2=+0.06 *10* (1987Su05). (1439γ)(1216γ)(θ): A_2=−0.27 *4*, A_4=+0.01 *6* (1989Za03). (1439γ)[657γ](559γ)(θ): A_2=−0.028 *19*, A_4=+0.01 *3* (1989Za03). δ: values from this dataset: −0.02 *10* (1987Su05), +0.01 *3* (1989Za03), +0.13 *9* (1980Ka36).
1453.713 *20*	0.234[@] *6*	2669.875	2^-	1216.153	2^+	(E1+M2)	+0.045 *19*		%Iγ=0.0952 *25* Additional information 32. 1454$\gamma(\theta)$: A_2=−0.28 *15* (1987Su05). (1454γ)(1216γ)(θ): A_2=+0.22 *4*, A_4=−0.04 *7* (1989Za03).

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$ (continued)

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
									(1454γ)[657γ](559γ)(θ): A_2=−0.05 *3*, A_4=−0.05 *5* (1989Za03).
									δ: values from this dataset: −0.11 *12* (1987Su05), +0.05 *2* (1989Za03).
1466.6 *3*	0.0012 *3*	2026.03	4^+	559.100	2^+				%Iγ=4.9×10^{-4} *12*
1533.07 *5*	0.0518 *7*	2655.347	1	1122.257	0^+	D			%Iγ=0.02107 *32* Additional information 28. 1533γ(θ): A_2=+0.2 *7* (1987Su05). δ: 0.0 (1987Su05).
1568.22 *7*	0.0150 *2*	2127.23	$(2)^+$	559.100	2^+				%Iγ=0.00610 *9*
1611.5 *3*	0.0158 *6*	2170.67	(0^+)	559.100	2^+				%Iγ=0.00643 *25*
1787.62 *2*	0.639[@] *18*	1787.648	2^+	0.0	0^+				%Iγ=0.260 *8* Additional information 11. 1788γ(θ): A_2=−0.61 *14* (1976Ba15).
1870.01 *2*	0.119[@] *4*	2429.146	3^-	559.100	2^+	(E1+M2)	+0.17 *3*		%Iγ=0.0484 *17* 1870γ(θ): A_2=+0.34 *15* (1987Su05). (1870γ)(559γ)(θ): A_2=+0.05 *4*, A_4=+0.01 *6* (1989Za03). δ: values from this dataset: +0.00 *8* (1987Su05), +0.17 *3* (1989Za03).
1955.48 *5*	0.0228 *6*	2514.63	2^+	559.100	2^+				%Iγ=0.00927 *25* Additional information 23.
2096.16 *2*	1.25[@] *3*	2655.347	1	559.100	2^+	D(+Q)	−0.043 *+43−42*		%Iγ=0.508 *13* Additional information 29. 2096γ(θ): A_2=+0.07 *8* (1987Su05), 0.09 *8* (1976Ba15). (2096γ)(559γ)(θ): A_2=−0.258 *12*, A_4=−0.034 *19* (1989Za03). δ: 0.00 *8* (1987Su05), +0.02 *6* (1989Za03).
2110.6 *1*	0.721 *14*	2669.875	2^-	559.100	2^+	(E1+M2)	+0.047 *12*		%Iγ=0.293 *6* 2111γ(θ): A_2=−0.39 *20* (1987Su05), −0.29 *9* (1976Ba15). (2111γ)(559γ)(θ): A_2=+0.320 *16*, A_4=−0.047 *26* (1989Za03). Additional information 33. δ: values from this dataset: −0.02 *16* (1987Su05), −0.09 *2* (1989Za03).
2127.0 *1*	0.0027 *2*	2127.23	$(2)^+$	0.0	0^+				%Iγ=0.00110 *8*
2429.07 *5*	0.0768 *11*	2429.146	3^-	0.0	0^+	[E3]		0.000437 *6*	α(K)=9.91×10^{-5} *14*; α(L)=1.026×10^{-5} *14*; α(M)=1.596×10^{-6} *22* α(N)=1.367×10^{-7} *19*; α(IPF)=0.000326 *5* %Iγ=0.0312 *5* Additional information 21.
2655.43 *8*	0.100 *1*	2655.347	1	0.0	0^+				%Iγ=0.0407 *5*

$^{76}_{34}Se_{42}$-9

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36 (continued)

$\gamma(^{76}Se)$ (continued)

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[†]	Comments
2669.67 *5*	0.0007 *1*	2669.875	2^-	0.0	0^+	[M2]	0.000460 *6*	%Iγ=2.9×10^{-4} *4* α(K)=8.80×10^{-5} *12*; α(L)=9.08×10^{-6} *13*; α(M)=1.413×10^{-6} *20* α(N)=1.213×10^{-7} *17*; α(IPF)=0.000362 *5* Additional information 34. E_γ: level-energy difference=2669.88. I_γ: 0.0007 *1* in 1998De26, 0.003 *1* (1982We14), 0.0006 *1* (1980Ka36), 0.006 *1* (1972Ar03). Large discrepancy in Iγ may be due to contribution from coincidental summing of 2110γ and 559γ.

† Additional information 35.

‡ From 1998De26, unless otherwise stated. Quoted uncertainties are too low to be realistic for data from Ge detectors, and are probably statistical only. These result in a poor least-squares fit of the level scheme. Evaluators have adopted a minimum uncertainty of 0.01 keV for strong γ rays (Iγ>1), and 0.02 keV for Iγ=0.1-1, and 0.05 keV for Iγ<0.1 to account for systematic effects, and to get an acceptable least-squares fit (with reduced χ^2=1.8 as compared to critical χ^2=1.7). In addition, uncertainties of 1216, 1228 and 2096 keV gamma rays were increased to 0.02 keV due to their poor fits using 0.01 keV uncertainty. Using uncertainties as quoted by 1998De26 gives a reduced χ^2=28. Values from several other studies (e.g. 1982We14, 1980Ka36, 1973Na04) are in good agreement with those from 1998De26, but are less precise, and with differences in isotopic assignments and placements in level scheme for very weak (Iγ<0.01 or so) γ rays.

Unweighted average of values from 1998De26 and 2000Ma57, when a value is available from the latter. Values from many other studies e.g. (1980Ka36, 1973Na04) are in good agreement with those from 1998De26 and 2000Ma57, but are less precise, and with differences in isotopic assignments and placements in level scheme for very weak γ rays. Some of the intensities in 2000Ma57 are quoted too precisely to be realistic, for example 0.2-0.3% accuracy for 657, 1212, 1216, 1228 keV γ rays. Uncertainties in 1998De26 are generally not lower than 1%, but some of the weak lines seem to be quoted with too high a precision. That is one reason evaluators decided to take an unweighted of the two results.

@ Gamma intensity is measured in 2000Ma57.

& From Adopted Gammas. Some adopted δ values are taken from this dataset, as indicated under comments.

a The γ ray from 1998De26 only.

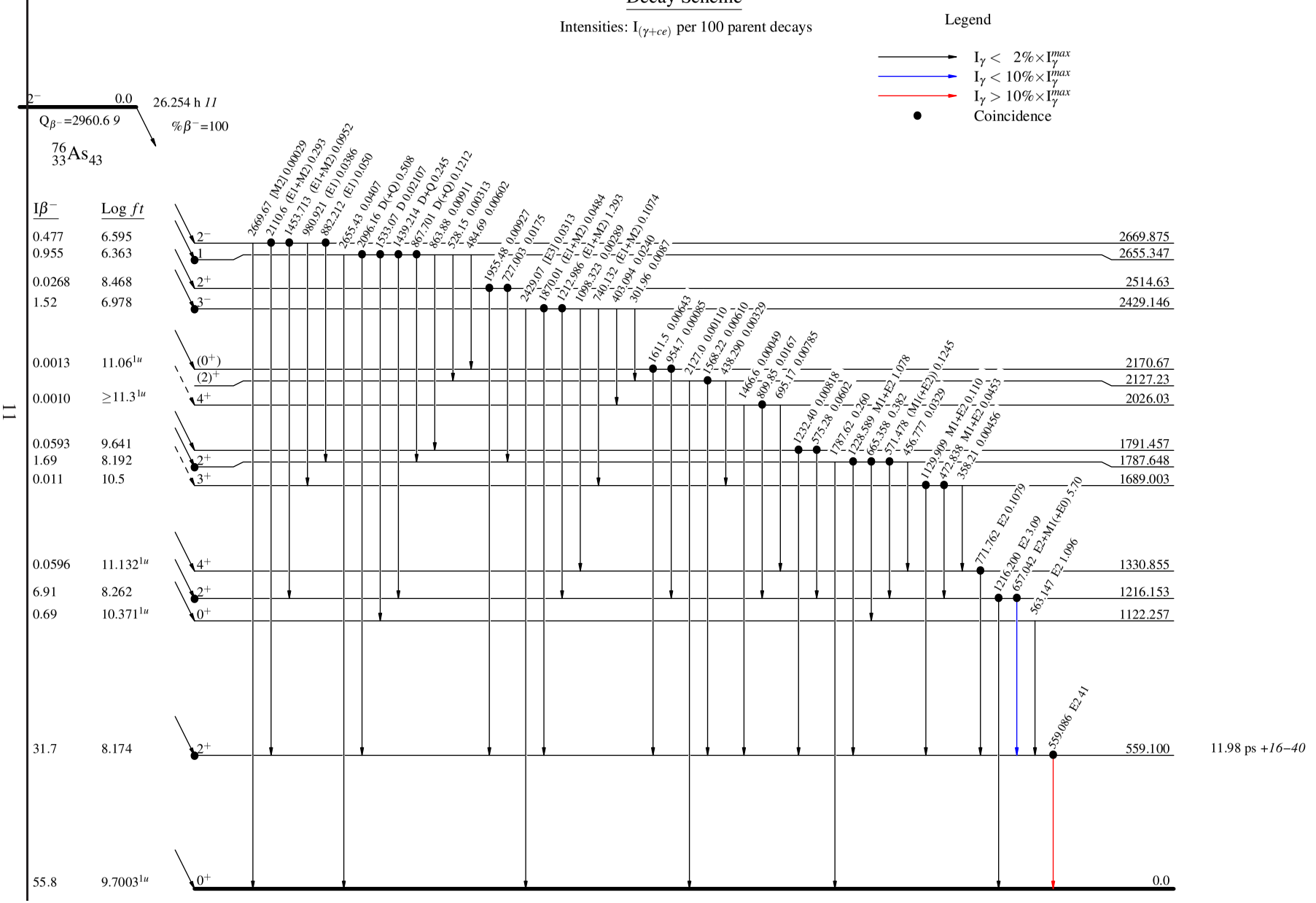
b For absolute intensity per 100 decays, multiply by 0.4067 *29*.

$^{76}_{34}Se_{42}$-10

^{76}As β^- decay (26.254 h) 1998De26,1982We14,1980Ka36

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



$^{76}_{34}Se_{42}$-11