Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	30-Sep-2020

Q(β^-)=683.2 *17*; S(n)=9696.3 *19*; S(p)=7992.4 *17*; Q(α)=−6641.9 *24* 2017Wa10
S(2n)=17024.8 *19*, S(2p)=20029.7 *30* (2017Wa10).
1947Ar01, 1950St02: ^{77}As isotope identified and produced as fission activity, and subsequent counting of β spectra.
Other reaction:
^{77}Se(n,p) E=13-16.6 MeV: 1989Ho20: measured cross section.
^{80}Se(p,α) E=15 MeV: 1982Zu04: Q value measured.
Theoretical calculations: consult the NSR database at www.nndc.bnl.gov for 13 primary theory references dealing with nuclear structure calculations.
Additional information 1.

^{77}As Levels

Cross Reference (XREF) Flags

A	^{77}Ge β^- decay (11.211 h)	E	^{76}Ge(^{3}He,d)
B	^{77}Ge β^- decay (53.7 s)	F	^{76}Ge(α,p2nγ)
C	^{77}As IT decay (114.0 μs)	G	^{78}Se(μ^-,nγ)
D	^{76}Ge(p,γ),(p,n)	H	^{78}Se(d,^{3}He),(pol d,^{3}He)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	XREF	Comments
0.0	3/2$^-$	38.79 h *5*	ABC EFGH	%β^-=100 μ=+1.2940 *13* (1999Oh01,2019StZV) J$^\pi$: L(^{3}He,d)=(d,^{3}He)=1; log *ft*=7.2 to 5/2$^-$ state in ^{77}Se. T$_{1/2}$: weighted average of 38.83 h 5 (1968Re04), 38.5 *5* (1959Kj49), 38.7 h 5 (1955Sc36), 38.68 h 9 (1953Bu57), 38.0 h 5 (1953Su04), 39 h 1 (1953Re12). Others: 38 h (1951Tu01), ≈40 h (1950St02). μ: NMR on oriented nuclei by detecting β and γ rays (1999Oh01). 1999Oh01 point out that this value is smaller than Schmidt value of +3.79 for p$_{3/2}$ orbital, the deviation may be explained by the core-polarization effects. Calculated value of +1.50 for $\pi[(2p_{3/2})^3(1g_{9/2})^2]$ and +1.92 for $\pi[(2p_{3/2})^3(1f_{5/2})^2]$ favors the former configuration. Measured μ=+1.2946 *13* by 1999Oh01 is re-evaluated to μ=+1.2940 *13* by 2019StZV.
194.71 *6*	3/2$^-$	7.4 ns *3*	AB E H	J$^\pi$: L(^{3}He,d)=(d,^{3}He)=1; log $f^{1u}t$=11.0 from 7/2$^+$ rejects 1/2. T$_{1/2}$: from $\gamma\gamma$(t) in ^{77}Ge decay (1970Dr09).
215.54 *3*	3/2$^-$	<0.3 ns	AB EFGH	J$^\pi$: L(^{3}He,d)=(d,^{3}He)=1; log $f^{1u}t$=10.0 from 7/2$^+$ rejects 1/2. T$_{1/2}$: from $\gamma\gamma$(t) in ^{77}Ge decay (1970Tu03).
264.426 *20*	5/2$^-$	304 ps *3*	ABC EF H	μ=+0.736 *22* (1989Mo14,2014StZZ) Q<0.75 (1990Mo23) J$^\pi$: L(^{3}He,d)=(d,^{3}He)=3; $\gamma\gamma(\theta)$ in ^{77}Ge decay (1974LeYO) is consistent with J=5/2, not 7/2. T$_{1/2}$: from $\gamma\gamma$(t) in ^{77}Ge decay (1989Mo14). μ: $\gamma\gamma(\theta$,H,t) method using 211-264 cascade (1989Mo14,1990Mo22). Others: +0.83 *7* (1974LiYP,1973Ch42), 1972BeWU. Q: DPAC method (1990Mo23). Value not listed in 2014StZZ compilation.
475.48[@] *4*	9/2$^+$	114.0 μs *25*	A C EF H	%IT=100 μ=+5.525 *9* (1970BeYN,2014StZZ) J$^\pi$: L(^{3}He,d)=(d,^{3}He)=4; $\gamma\gamma(\theta)$ in ^{77}Ge decay (1974LeYO). T$_{1/2}$: from 1980Jo11 (time digitized multiscaling). Others: 116 μs *4* (1968Io01,1957Sc11), >2 μs (1997Is13). μ: PAD method (1970BeYN).
503.88 *17*	1/2$^-$		B E H	J$^\pi$: L(^{3}He,d)=(d,^{3}He)=1; Ay(θ) in (pol d,^{3}He).

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Adopted Levels, Gammas (continued)

^{77}As Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
614.48 *4*	3/2⁻		AB H	Jπ: L(d,^{3}He)=1; log $f^{1u}t$=10.2 from 7/2⁺ rejects 1/2.
631.88 *3*	5/2⁺	60 ps *6*	A EF H	μ=+2.53 *40* (1974Ch31,1974LiYP,2014StZZ) XREF: H(638). Jπ: L(^{3}He,d)=(d,^{3}He)=2; γγ(θ) in ^{77}Ge decay (1974LeYO) is consistent with J=5/2, not 3/2. $T_{1/2}$: from βγ(t) in ^{77}Ge decay (1974ChXP). Other: 75 ps *15* (1970Tu03). μ: IPAC method (1974Ch31,1974LiYP).
634.47 *5*	5/2⁺,7/2⁻		A	Jπ: gammas to 3/2⁻ and 9/2⁺.
784.70 *4*	7/2⁻		A E H	Jπ: L(d,^{3}He)=3; Ay(θ) in (pol d,^{3}He).
875.22 *5*	3/2⁻,5/2⁺		A E	Jπ: log *ft*=9.3 from 7/2⁺; γ to 3/2⁻; γ from 1/2⁺.
889.02 *6*	3/2⁻,5/2,7/2⁻		A F H	Jπ: log *ft*=9.3 from 7/2⁺; γ to 3/2⁻.
1008 *10*	(1/2⁻,3/2⁻)		H	Jπ: L(d,^{3}He)=1.
1048.36@ *18*	(13/2⁺)		F	Jπ: ΔJ=2 γ to 9/2⁺.
1052 *4*	1/2⁻,3/2⁻		E H	E(level): weighted average of E(^{3}He,d)=1052 *5* and E(d,^{3}He)=1052 *6*. Jπ: L(^{3}He,d)=(d,^{3}He)=1.
1058.66 *8*	(9/2⁻)		A F	Jπ: ΔJ=2 γ to 5/2⁻.
1158 *5*	1/2⁺		E	Jπ: L=0 in (^{3}He,d).
1165.00 *9*	5/2⁻		A H	Jπ: L(d,^{3}He)=3; Ay(θ) in (pol d,^{3}He).
1189.83 *4*	7/2⁻	<0.2 ns	A EF	Jπ: L(^{3}He,d)=3; γγ(θ) in ^{77}Ge decay; log *ft*=7.2 (log $f^{1u}t$=8.0) from 7/2⁺; γ to 9/2⁺. $T_{1/2}$: from βγ(t) in ^{77}Ge β⁻ decay.
1201.41 *6*	1/2⁺		A H	Jπ: L(d,^{3}He)=0.
1221.30 *7*	(11/2⁺)		A F	Jπ: ΔJ=1 γ to 9/2⁺.
1279.99 *9*	(≤7/2)		A	Jπ: γ to 3/2⁻.
1319.76 *6*	7/2⁻		A H	Jπ: L(d,^{3}He)=3; Ay(θ) in (pol d,^{3}He).
1345.19 *7*	(3/2⁻,5/2,7/2⁻)		A	Jπ: log *ft*=8.99 from 7/2⁺; γ to 3/2⁻.
1350.29 *13*	(3/2⁻,5/2,7/2⁻)		A	Jπ: log *ft*=9.6 from 7/2⁺; γ to 3/2⁻.
1397.65? *25*	(5/2⁻,7/2⁻)		A	Jπ: possible gammas to 3/2⁻ and (9/2⁻).
1398.70 *5*	(7/2⁺)		A	Jπ: γγ(θ) in ^{77}Ge decay; log *ft*=7.9 (log $f^{1u}t$=8.7) from 7/2⁺; gammas to 5/2⁺ and (11/2⁺).
1457.75 *5*	(5/2,7/2⁻)		A H	Jπ: γγ(θ) in ^{77}Ge decay; gammas to 3/2⁻ and 7/2⁻; log *ft*=7.9 (log $f^{1u}t$=8.2) from 7/2⁺.
1528.33 *4*	5/2⁺		A E	Jπ: L(^{3}He,d)=2; γγ(θ) in ^{77}Ge decay; γ to 9/2⁺; log *ft*=7.8 (log $f^{1u}t$=8.4) from 7/2⁺.
1538.86 *6*	(1/2⁺,3/2,5/2⁺)		A	Jπ: gammas to 1/2⁺ and 5/2⁺; possible 219.1 γ to 7/2⁻ disfavors 1/2⁺ and 3/2⁺.
1560.46 *5*	5/2⁺	<0.1 ns	A	Jπ: γγ(θ) in ^{77}Ge decay; gammas to 9/2⁺ and 3/2⁻. Parity from 1085γ to 9/2⁺ not M2 from RUL. $T_{1/2}$: from βγ(t) in ^{77}Ge β⁻ decay.
1573.77 *5*	(3/2⁻,5/2,7/2⁻)		A H	XREF: H(1576). E(level): level is weakly populated in (d,^{3}He). Jπ: log *ft*=7.7 (log $f^{1u}t$=8.3) from 7/2⁺; gammas to 3/2⁻ and 7/2⁻.
1604.67 *8*	1/2⁻,3/2⁻		B H	Jπ: log *ft*=5.68 from 1/2⁻; L(d,^{3}He)=1.
1617 *5*	1/2⁻,3/2⁻		E H	Jπ: L(d,^{3}He)=1. L=1+3 in (^{3}He,d) indicates a doublet with J^π=1/2⁻,3/2⁻ and 5/2⁻,7/2⁻, respectively.
1654 *5*	1/2⁻,3/2⁻		E H	E(level),Jπ: doublet with L(d,^{3}He)=L(^{3}He,d)=1+4.
1654 *5*	7/2⁺,9/2⁺		E H	E(level),Jπ: doublet with L(d,^{3}He)=L(^{3}He,d)=1+4.
1676.46 *12*	1/2⁻,3/2⁻		B	Jπ: log *ft*=5.81 from 1/2⁻.
1732.80 *9*	(3/2⁻,5/2⁺)		A	Jπ: log *ft*=8.8 from 7/2⁺; γ to 1/2⁺.
1736.81 *21*	(13/2⁺)		F	
1760 *10*			E	
1837.73 *12*	(≤7/2)		A E	XREF: E(1825). Jπ: γ to 3/2⁻.
1888.43 *23*	(15/2⁺)		F	

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Adopted Levels, Gammas (continued)

^{77}As Levels (continued)

E(level)[†]	J^{π}[‡]	XREF	Comments
1929.9 *4*		F	
1971.17 *6*	$7/2^+,9/2^+$	A E	XREF: E(1960). J^{π}: L(^{3}He,d)=4(+0); log *ft*=6.8 (log $f^{1u}t$=7.2) from $7/2^+$; gammas to $5/2^+$, $9/2^+$ and $(11/2^+)$. E(level): this level may be a doublet with $J^{\pi}=(1/2^+)$ from L(^{3}He,d)=(0) for the second component.
2000.19 *4*	$5/2^+$	A H	J^{π}: L(d,^{3}He)=2; $\gamma\gamma(\theta)$ in ^{77}Ge decay; log *ft*=6.3 (log $f^{1u}t$=6.6) from $7/2^+$; gammas to $1/2^+$ and $7/2^-$.
2000.4[@] *3*	$(17/2^+)$	F	
2110.94 *5*	$5/2^+$	A E H	J^{π}: L(d,^{3}He)=2; log *ft*=6.6 (log $f^{1u}t$=6.8) from $7/2^+$; gammas to $5/2^-$, $5/2^+$, $7/2^-$ and $(7/2^+)$. E(level): L(^{3}He,d)=0+2 suggests a doublet with $J^{\pi}=1/2^+$ for one level and $3/2^+,5/2^+$ for the other.
2123.7 *10*		F	
2195.8 *3*	$1/2^-$	A E H	XREF: A(?). J^{π}: L(d,^{3}He)=L(^{3}He,d)=1; Ay(θ) in (pol d,^{3}He). An uncertain 1411γ to $7/2^-$ implying mult=M3 is unlikely; the placement may be incorrect.
2335 *10*	$1/2^-,3/2^-$	E	J^{π}: L(^{3}He,d)=1.
2341.75 *4*	$(5/2)^+$	A	J^{π}: $\gamma\gamma(\theta)$ in ^{77}Ge decay; log *ft*=5.8 (log $f^{1u}t$=5.7) from $7/2^+$; gammas to $3/2^-$ and $7/2^-$.
2354.21 *5*	$(7/2^-)$	A	J^{π}: $\gamma\gamma(\theta)$ in ^{77}Ge decay; log *ft*=6.1 (log $f^{1u}t$=5.9) from $7/2^+$; gammas to $3/2^-$, $9/2^+$ and $(9/2^-)$.
2372	$(3/2^+,5/2^+)$	E	J^{π}: L(^{3}He,d)=(2).
2424.53 *9*	$(7/2^-)$	A E	XREF: E(2410). J^{π}: log *ft*=6.6 (log $f^{1u}t$=6.3) from $7/2^+$; gammas to $3/2^-$, $9/2^+$ and $(9/2^-)$.
2463.3 *3*	$(5/2,7/2,9/2^+)$	A	J^{π}: log *ft*=7.17 (log $f^{1u}t$=6.8) from $7/2^+$; γ to $5/2^+$.
2512.8 *3*		F	
2513.47 *8*	$(7/2)^+$	A E	XREF: E(2516). J^{π}: L(^{3}He,d)=4; log *ft*=5.84 (log $f^{1u}t$=5.3) from $7/2^+$; gammas to $5/2^-$, $5/2^+$, $9/2^+$ and $(9/2^-)$.
2543.96 *8*	$(5/2,7/2^-)$	A	J^{π}: log *ft*=5.98 (log $f^{1u}t$=5.4) from $7/2^+$; gammas to $3/2^-$ and $7/2^-$.
2544 *6*	$1/2^-,3/2^-$	H	J^{π}: L(d,^{3}He)=1. E(level): this level agrees in energy with 2543.88 level populated in β decay, but probably is a different level due to different J^{π} assignments.
2585.0[&] *4*	$(13/2^-)$	F	
2623 *10*	$1/2^-,3/2^-$	E H	E(level),J^{π}: doublet with L(d,^{3}He)=L(^{3}He,d)=1+4.
2623 *10*	$7/2^+,9/2^+$	E H	E(level),J^{π}: see comment for 2623; $1/2^-,3/2^-$ component.
2655 *5*	$1/2^-,3/2^-$	E	J^{π}: L(^{3}He,d)=1.
2745.3[&] *4*	$(15/2^-)$	F	
2750 *10*	$3/2^+,5/2^+$	E	J^{π}: L(^{3}He,d)=2.
2846 *10*		E	
2934 *10*	$(3/2\ \text{to}\ 9/2)^+$	E	J^{π}: L(^{3}He,d)=2+4 suggests a doublet with $J^{\pi}=3/2^+,5/2^+$ and $7/2^+,9/2^+$, respectively.
3002.8[&] *4*	$(17/2^-)$	F	
3009 *5*	$(5/2^-,7/2,9/2^+)$	E	J^{π}: L(^{3}He,d)=3,4 suggests a doublet with $J^{\pi}=5/2^-,7/2^-$ and $7/2^+,9/2^+$, respectively.
3086 *10*		E	J^{π}: L(^{3}He,d)=1+4 suggests a doublet with $J^{\pi}=1/2^-,3/2^-$ and $7/2^+,9/2^+$, respectively.
3118 *5*	$(3/2^+,5/2^+)$	E	J^{π}: L=(2) in (^{3}He,d).
3151.0[@] *4*	$(21/2^+)$	F	
3190 *10*		E	J^{π}: L(^{3}He,d)=0+3,4 suggests either a doublet with $J^{\pi}=1/2^+$ and $5/2^-,7/2^-$ or a single level with $J^{\pi}=7/2^+,9/2^+$, respectively.
3258 *10*		E	J^{π}: L(^{3}He,d)=(1+4) suggests a doublet with $J^{\pi}=(1/2^-,3/2^-)$ and $(7/2^+,9/2^+)$, respectively.
3312 *10*	$3/2^+,5/2^+$	E	J^{π}: L=2 in (^{3}He,d).
3363.7[&] *5*	$(19/2^-)$	F	
3376 *10*		E	J^{π}: L(^{3}He,d)=1+4 suggests a doublet with $J^{\pi}=1/2^-,3/2^-$ and $7/2^+,9/2^+$, respectively.

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Adopted Levels, Gammas (continued)

^{77}As Levels (continued)

E(level)[†]	J^{π}[‡]	XREF	Comments
3483 *10*	$1/2^+$	E	J^{π}: L(^{3}He,d)=0.
3559 *10*	$1/2^-,3/2^-$	E	J^{π}: L(^{3}He,d)=1.
3593 *10*	$1/2^+$&$3/2^+,5/2^+$	E	J^{π}: L(^{3}He,d)=0+2.
3633 *15*	$1/2^+$	E	J^{π}: L(^{3}He,d)=0.
3676 *15*	$1/2^+$&$7/2^+,9/2^+$	E	J^{π}: L(^{3}He,d)=0+4.
3742 *15*	$1/2^+$	E	J^{π}: L(^{3}He,d)=0.
3770 *15*	$(3/2$ to $9/2)^+$	E	J^{π}: L(^{3}He,d)=2(+4) suggests a doublet with $J^{\pi}=3/2^+,5/2^+$ and $7/2^+,9/2^+$, respectively.
3835 *15*	$1/2^+$&$7/2,9/2^+$	E	J^{π}: L(^{3}He,d)=0+4.
3855.7[&] *5*	$(21/2^-)$	F	
3885 *15*	$1/2^+$&$1/2^-,3/2^-$	E	J^{π}: L(^{3}He,d)=0+1.
3960 *15*	$1/2^+$&$3/2^+,5/2^+$	E	J^{π}: L(^{3}He,d)=0+2.
4022 *20*	$1/2^+$	E	J^{π}: L(^{3}He,d)=0.
4102 *20*	$3/2^+,5/2^+$	E	J^{π}: L(^{3}He,d)=2.
4192 *20*	(1/2 to 9/2)	E	J^{π}: L(^{3}He,d)=1+3+4 suggests a triplet with $J^{\pi}=1/2^-,3/2^-$; $5/2^-,7/2^-$ and $7/2^+,9/2^+$, respectively.
4325 *20*	$1/2^+$&$3/2^+,5/2^+$	E	J^{π}: L(^{3}He,d)=0+2.
4456.3[@] *7*	$(25/2^+)$	F	
12070 *7*	$(1/2^-)$[#]	D	
12128 *7*	$(9/2^+)$[#]	D	
12426 *5*	$(5/2^+)$[#]	D	
12544 *5*	$(3/2^-)$[#]	D	
12804 *5*	$(5/2^+)$[#]	D	
12924 *5*		D	
13094 *14*		D	
13243 *9*		D	
13439 *12*	$(1/2^+)$[#]	D	
13697 *12*		D	

† From least-squares fit to Eγ data for levels populated in γ-ray studies. Reduced χ^2=1.3. Seven gamma-ray energies are fitted poorly, but most of these are doublets.

‡ For high-spin states (J>9/2), the assignments are from $\gamma\gamma(\theta)$ (DCO) data with the assumptions of ascending spins with excitation energy, and multipolarities of dipole and E2.

\# Identified as an isobaric analog state of ^{77}Ge (see ^{77}Ge Adopted Levels).

@ Band(A): ΔJ=2, $\pi g_{9/2}$ band. Band from 1996Do05.

& Band(B): ΔJ=1 band. Band from 1996Do05 with probable 3-quasiparticle configuration=$\pi g_{9/2}\otimes\nu g_{9/2}\otimes\nu(p_{1/2},p_{3/2},f_{5/2})$.

Adopted Levels, Gammas (continued)

$\gamma(^{77}As)$

E_i(level)	J^{π}_i	E_{γ}†	I_{γ}†	E_f	J^{π}_f	Mult.‡	δ‡	α#	Comments
194.71	3/2⁻	194.74 10	100	0.0	3/2⁻	[M1,E2]		0.04 3	B(M1)(W.u.)<0.00041; B(E2)(W.u.)<14
215.54	3/2⁻	215.51 4	100	0.0	3/2⁻	(M1+E2)	−0.164 16	0.01278 25	B(M1)(W.u.)>0.0070; B(E2)(W.u.)>4.4 δ: from $\gamma\gamma(\theta)$ in ^{77}Ge decay.
264.426	5/2⁻	264.450 25	100	0.0	3/2⁻	M1+E2		0.014 8	δ: −1.46 2 or −0.321 11 from (211γ)(264γ)(θ) and (367γ)(264γ)(θ) (1974LeYO). Other: −0.8 3 from (211γ)(264γ)(θ) (1989Mo14). B(M1)(W.u.)=0.00193 4, B(E2)(W.u.)=36.5 6 for δ(E2/M1)=1.0.
475.48	9/2⁺	211.03 4	100.0 25	264.426	5/2⁻	(M2+E3)	+0.100 7	0.0734	B(M2)(W.u.)=0.0321 14; B(E3)(W.u.)=14.5 21
		475.46 10	3.6 3	0.0	3/2⁻	[E3]		0.00910	B(E3)(W.u.)=0.179 16
503.88	1/2⁻	503.86 18	100	0.0	3/2⁻				
614.48	3/2⁻	350.10 15	1.35 4	264.426	5/2⁻				
		398.97 11	8.6 8	215.54	3/2⁻				
		419.73 11	100 3	194.71	3/2⁻				
		614.36& 10	44& 7	0.0	3/2⁻				
631.88	5/2⁺	156.35 11	3.1 5	475.48	9/2⁺	[E2]		0.1484	B(E2)(W.u.)=80 16
		367.49 4	64 3	264.426	5/2⁻	(E1)			B(E1)(W.u.)=4.0×10^{-5} 5
		416.35 4	100 5	215.54	3/2⁻	[E1]			B(E1)(W.u.)=4.3×10^{-5} 5
		631.85 10	32.5 19	0.0	3/2⁻	[E1]			B(E1)(W.u.)=4.0×10^{-6} 5
634.47	5/2⁺,7/2⁻	159.3 3	2.0 8	475.48	9/2⁺				
		634.40 10	100 4	0.0	3/2⁻				
784.70	7/2⁻	150.46 15	3.0 6	634.47	5/2⁺,7/2⁻				
		520.6 10	20 10	264.426	5/2⁻				
		784.80 10	100 5	0.0	3/2⁻				
875.22	3/2⁻,5/2⁺	610.88 14	8.3 9	264.426	5/2⁻				
		659.99 15	3.8 6	215.54	3/2⁻				
		680.40 14	4.9 5	194.71	3/2⁻				
		875.23 10	100 6	0.0	3/2⁻				
889.02	3/2⁻,5/2,7/2⁻	254.66 11	100 4	634.47	5/2⁺,7/2⁻				
		624.75 11	96 4	264.426	5/2⁻				
		673.12& 10	67& 7	215.54	3/2⁻				E_{γ}: poor fit, level-energy difference=673.48.
		889.3 6	5.2 19	0.0	3/2⁻				
1048.36	(13/2⁺)	572.9 2	100	475.48	9/2⁺	Q			
1058.66	(9/2⁻)	794.37 11	100	264.426	5/2⁻	Q			
1165.00	5/2⁻	900.74 13	100 12	264.426	5/2⁻				
		970.34 19	25 4	194.71	3/2⁻				
		1164.72 15	37 9	0.0	3/2⁻				
1189.83	7/2⁻	557.92 8	100 6	631.88	5/2⁺	(E1+M2)	−0.139 6		B(E1)(W.u.)>7.1×10^{-6} Mult.: B(M2)(W.u.)>1.8, compared to the limit <1 from RUL. The discrepancy could be due to too large a value of δ.
		714.37 10	44.6 25	475.48	9/2⁺				

From ENSDF

$^{77}_{33}As_{44}$-5

$\gamma(^{77}$As) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
1189.83	7/2−	925.49[&] *11*	4.2[&] *4*	264.426	5/2−		
		974 *1*		215.54	3/2−		
1201.41	1/2+	325.5 *10*	16 *4*	875.22	3/2−,5/2+		
		569.39 *16*	100 *46*	631.88	5/2+		
		985.76 *11*	75 *10*	215.54	3/2−		
		1007.46 *25*	9.3 *21*	194.71	3/2−		E_γ: poor fit, level-energy difference=1006.69.
		1201.43 *14*	51 *5*	0.0	3/2−		
1221.30	(11/2+)	745.77 *10*	100	475.48	9/2+	D(+Q)	
1279.99	(≤7/2)	665.5 *4*	3.2 *20*	614.48	3/2−		
		1279.99 *11*	100 *6*	0.0	3/2−		
1319.76	7/2−	430.60 *21*	3.44 *18*	889.02	3/2−,5/2,7/2−		
		444.59 *18*	6.87 *15*	875.22	3/2−,5/2+		
		534.99 *15*	12.7 *20*	784.70	7/2−		
		685.31[&] *11*	22.4[&] *24*	634.47	5/2+,7/2−		
		705.25 *11*	36.5 *18*	614.48	3/2−		
		1055.8[@] *4*	3.6[@] *13*	264.426	5/2−		
		1104.26 *13*	13.0 *16*	215.54	3/2−		
		1319.71 *11*	100 *3*	0.0	3/2−		
1345.19	(3/2−,5/2,7/2−)	470.5 *10*	6 *3*	875.22	3/2−,5/2+		
		730.53 *18*	8.0 *12*	614.48	3/2−		
		1080.84 *11*	100 *10*	264.426	5/2−		
		1130.1 *4*	3.4 *12*	215.54	3/2−		
1350.29	(3/2−,5/2,7/2−)	1134.76 *14*	100 *15*	215.54	3/2−		
		1155.52 *26*	51 *10*	194.71	3/2−		
1397.65?	(5/2−,7/2−)	339.6[a] *4*	100 *77*	1058.66	(9/2−)		
		1397.3[a] *3*	10.8 *8*	0.0	3/2−		
1398.70	(7/2+)	177.28 *13*	11 *4*	1221.30	(11/2+)		
		208.83 *15*	100 *14*	1189.83	7/2−		
		614.36[&] *10*	8.3[&] *12*	784.70	7/2−		E_γ: level-energy difference=613.99.
		766.75 *10*	74 *4*	631.88	5/2+	(D+Q)	δ: δ=+0.2 +2 −1 for J(1399)=5/2.
		923.14 *11*	66 *5*	475.48	9/2+		
1457.75	(5/2,7/2−)	268.10 *22*	11 *11*	1189.83	7/2−		
		673.12[&] *10*	19.7[&] *20*	784.70	7/2−		
		823.25 *12*	23.7 *14*	634.47	5/2+,7/2−		
		825.80 *12*	2.39 *16*	631.88	5/2+		
		843.22 *11*	8.1 *4*	614.48	3/2−		
		1193.30 *10*	100 *5*	264.426	5/2−		
		1242.23 *11*	15.7 *10*	215.54	3/2−		
1528.33	5/2+	338.60 *12*	80 *7*	1189.83	7/2−		
		639.12 *15*	3.8 *7*	889.02	3/2−,5/2,7/2−		
		743.63 *11*	21.3 *17*	784.70	7/2−		
		896.54 *11*	14.1 *6*	631.88	5/2+		

Adopted Levels, Gammas (continued)

$\gamma(^{77}As)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	Comments
1528.33	5/2+	913.85 11	43 3	614.48	3/2−			
		1052.56 13	4.2 8	475.48	9/2+			
		1263.91 10	100 7	264.426	5/2−	(E1)		
		1312.84 11	41.7 18	215.54	3/2−	(D+Q)		
		1528.33 13	5.5 4	0.0	3/2−			
1538.86	(1/2+,3/2,5/2+)	219.1 3	14 14	1319.76	7/2−			
		337.53 15	21 3	1201.41	1/2+			
		907.01 10	100 5	631.88	5/2+			
		924 1		614.48	3/2−			
		1323.25 23	1.7 3	215.54	3/2−			
		1538.83 11	15.0 9	0.0	3/2−			
1560.46	5/2+	685.31[&] 11	0.39[&] 4	875.22	3/2−,5/2+			
		775.84 19	0.26 6	784.70	7/2−			
		925.48[&] 11	0.99[&] 10	634.47	5/2+,7/2−			E_γ: poor fit, level-energy difference=925.98.
		928.89 10	17.1 9	631.88	5/2+	(M1+E2)	−0.6 4	B(M1)(W.u.)>1.9×10^{-5}; B(E2)(W.u.)>0.00031 E_γ: poor fit, level-energy difference=928.58.
		945.65[@] 18	0.57[@] 12	614.48	3/2−			
		1085.23 10	100 6	475.48	9/2+			
		1295.61[&] 11	1.38[&] 14	264.426	5/2−			E_γ: poor fit, level-energy difference=1296.03.
1573.77	(3/2−,5/2,7/2−)	698.57 11	33.1 13	875.22	3/2−,5/2+			
		788.96 11	14.4 8	784.70	7/2−			
		939.39 11	44 3	634.47	5/2+,7/2−			
		959.26 11	11.2 12	614.48	3/2−			
		1309.32 11	73 5	264.426	5/2−			
		1358.4 3	3.3 8	215.54	3/2−			
		1573.74 11	100 7	0.0	3/2−			
1604.67	1/2−,3/2−	990.3 3	10.9 12	614.48	3/2−			
		1100.8 5	3.3 8	503.88	1/2−			
		1340.0 5	7.1 9	264.426	5/2−			
		1389.1 5	3.3 7	215.54	3/2−			
		1409.94 16	49.4 25	194.71	3/2−			
		1604.65 10	100 5	0.0	3/2−			
1676.46	1/2−,3/2−	1061.6 5	3.2 9	614.48	3/2−			
		1172.4 5	2.5 10	503.88	1/2−			
		1411.8[a] 5	4.2 11	264.426	5/2−			
		1461.2 5	3.9 9	215.54	3/2−			
		1481.73 24	28.5 18	194.71	3/2−			
		1676.46 14	100 5	0.0	3/2−			
1732.80	(3/2−,5/2+)	531.26 14	100 14	1201.41	1/2+			
		857.62 9	70 6	875.22	3/2−,5/2+			
1736.81	(13/2+)	515.5 2	100	1221.30	(11/2+)	D(+Q)		
1837.73	(≤7/2)	557[a] 1	≈285	1279.99	(≤7/2)			

$^{77}_{33}As_{44}$-7

Adopted Levels, Gammas (continued)

$\gamma(^{77}\mathrm{As})$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]
1837.73	(≤7/2)	1643.1 *4*	100 *40*	194.71	$3/2^-$	
1888.43	$(15/2^+)$	667.0 *4*	≈7	1221.30	$(11/2^+)$	
		840.1 *2*	100 *11*	1048.36	$(13/2^+)$	D(+Q)
1929.9		709 *1*	≈40	1221.30	$(11/2^+)$	
		881.5 *3*	100 *40*	1048.36	$(13/2^+)$	
1971.17	$7/2^+,9/2^+$	749.89 *10*	88 *5*	1221.30	$(11/2^+)$	
		781.29 *10*	100 *6*	1189.83	$7/2^-$	
		1186.52 *13*	4.1 *6*	784.70	$7/2^-$	
		1339.28 *11*	7.1 *7*	631.88	$5/2^+$	
		1495.64 *11*	50 *3*	475.48	$9/2^+$	
2000.19	$5/2^+$	439.46 *11*	6.5 *3*	1560.46	$5/2^+$	
		461.37 *10*	41.6 *23*	1538.86	$(1/2^+,3/2,5/2^+)$	
		655.20 *22*	0.43 *13*	1345.19	$(3/2^-,5/2,7/2^-)$	
		798.82 *12*	1.67 *18*	1201.41	$1/2^+$	
		810.38 *10*	75 *4*	1189.83	$7/2^-$	(D+Q)
		1125.02 *11*	4.0 *3*	875.22	$3/2^-,5/2^+$	
		1215.43 *11*	4.2 *3*	784.70	$7/2^-$	
		1368.45 *10*	100 *3*	631.88	$5/2^+$	(D+Q)
		1385.81 *23*	0.30 *7*	614.48	$3/2^-$	
		1735.80 *14*	1.07 *12*	264.426	$5/2^-$	
		1784.40 *13*	0.23 *2*	215.54	$3/2^-$	
		2000.19 *11*	18.4 *10*	0.0	$3/2^-$	
2000.4	$(17/2^+)$	952.0 *2*	100	1048.36	$(13/2^+)$	Q
2110.94	$5/2^+$	582.56 *10*	94 *4*	1528.33	$5/2^+$	
		712.34 *11*	100 *5*	1398.70	$(7/2^+)$	
		921.01 *13*	9.2 *9*	1189.83	$7/2^-$	
		945.65[@a] *18*	4.3[@] *9*	1165.00	$5/2^-$	
		1326.07 *13*	5.0 *6*	784.70	$7/2^-$	
		1476.56 *11*	29.5 *16*	634.47	$5/2^+,7/2^-$	
		1479.03[&] *11*	9.8[&] *10*	631.88	$5/2^+$	
		1846.50 *11*	20.7 *10*	264.426	$5/2^-$	
2123.7		1065 *1*	100	1058.66	$(9/2^-)$	
2195.8	$1/2^-$	1030[a] *1*		1165.00	$5/2^-$	
		1411.2[a] *3*	100 *31*	784.70	$7/2^-$	[M3]
		1581[a] *1*		614.48	$3/2^-$	
2341.75	$(5/2)^+$	504.02 *12*	13.3 *10*	1837.73	(≤7/2)	
		802.92 *13*	7.0 *14*	1538.86	$(1/2^+,3/2,5/2^+)$	
		813.40 *11*	27.8 *12*	1528.33	$5/2^+$	
		884.12 *23*	3.2 *7*	1457.75	$(5/2,7/2^-)$	
		996.56 *11*	21.8 *12*	1345.19	$(3/2^-,5/2,7/2^-)$	
		1021.9 *3*	1.9 *6*	1319.76	$7/2^-$	
		1061.77 *12*	32.2 *25*	1279.99	(≤7/2)	
		1151.90 *11*	40.1 *16*	1189.83	$7/2^-$	

$^{77}_{33}\mathrm{As}_{44}$-8

Adopted Levels, Gammas (continued)

$\gamma(^{77}As)$ (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[†]	E_f	J^{π}_f	Comments
2341.75	$(5/2)^+$	1452.67 11	25.3 14	889.02	$3/2^-,5/2,7/2^-$	
		1465.4[&] 3	11.8[&] 12	875.22	$3/2^-,5/2^+$	E_γ: poor fit, level-energy difference=1466.5.
		1557.03 22	2.6 4	784.70	$7/2^-$	
		1709.86 11	65 4	631.88	$5/2^+$	
		1727.24 11	30.4 13	614.48	$3/2^-$	
		2077.30 11	49 3	264.426	$5/2^-$	
		2126.24 11	41.8 16	215.54	$3/2^-$	
		2341.74 11	100 6	0.0	$3/2^-$	
2354.21	$(7/2^-)$	1295.61[&] 11	14.4[&] 14	1058.66	$(9/2^-)$	
		1465.4[&] 3	14.3[&] 14	889.02	$3/2^-,5/2,7/2^-$	
		1479.03[&] 11	31[&] 3	875.22	$3/2^-,5/2^+$	
		1569.37 12	13.8 9	784.70	$7/2^-$	
		1719.72 11	100 4	634.47	$5/2^+,7/2^-$	
		1722.28 14	14.3 20	631.88	$5/2^+$	
		1878.76 18	9.7 9	475.48	$9/2^+$	
		2089.72 11	65 6	264.426	$5/2^-$	
		2353.4 7	1.17 13	0.0	$3/2^-$	
2424.53	$(7/2^-)$	313.4 10	56 14	2110.94	$5/2^+$	
		966.74 22	86 18	1457.75	$(5/2,7/2^-)$	
		1234.60 15	74 8	1189.83	$7/2^-$	
		1365 1		1058.66	$(9/2^-)$	
		1639.6 3	19 6	784.70	$7/2^-$	
		1792.48 24	83 42	631.88	$5/2^+$	
		1810.29 14	100 7	614.48	$3/2^-$	
		1948.87 24	25 4	475.48	$9/2^+$	
2463.3	$(5/2,7/2,9/2^+)$	1828.7 5	40 11	634.47	$5/2^+,7/2^-$	
		1831.5 3	100 46	631.88	$5/2^+$	
2512.8		624.4 2	100	1888.43	$(15/2^+)$	
2513.47	$(7/2)^+$	1055.8[@a] 4	10[@] 3	1457.75	$(5/2,7/2^-)$	
		1114.85 11	100 8	1398.70	$(7/2^+)$	
		1454.93 20	32 3	1058.66	$(9/2^-)$	
		1624.4 3	10 5	889.02	$3/2^-,5/2,7/2^-$	
		1881.57 24	14 3	631.88	$5/2^+$	
		2037.87 12	59 4	475.48	$9/2^+$	
		2248.6 4	14.9 14	264.426	$5/2^-$	
2543.96	$(5/2,7/2^-)$	1354.29 17	70 16	1189.83	$7/2^-$	
		1759.7 4	40 28	784.70	$7/2^-$	
		1911.93 14	96 10	631.88	$5/2^+$	
		1929.43 14	100 10	614.48	$3/2^-$	
		2280.0 3	22 6	264.426	$5/2^-$	
		2328.22 16	76 8	215.54	$3/2^-$	
2585.0	$(13/2^-)$	1363.8 5	100	1221.30	$(11/2^+)$	

$^{77}_{33}As_{44}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{77}As)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡
2745.3	(15/2$^-$)	160.3 *2*	83 *17*	2585.0	(13/2$^-$)	D	3151.0	(21/2$^+$)	1150.6 *3*	100	2000.4	(17/2$^+$)	Q
		1008.4 *5*	83 *50*	1736.81	(13/2$^+$)		3363.7	(19/2$^-$)	360.9 *2*	100	3002.8	(17/2$^-$)	D
		1696.9 *6*	100 *50*	1048.36	(13/2$^+$)	D	3855.7	(21/2$^-$)	492.0 *2*	100	3363.7	(19/2$^-$)	D
3002.8	(17/2$^-$)	257.5 *2*	100	2745.3	(15/2$^-$)	D	4456.3	(25/2$^+$)	1305.3 *5*	100	3151.0	(21/2$^+$)	Q

† From ^{77}Ge β^- decay (11.211 h) when a level is also seen in ^{77}Ge β^- decay (53.7 s) and/or in ^{76}Ge(α,p2nγ). In other cases, values are from ^{77}Ge β^- decay (53.7 s) for low-spin levels and from ^{76}Ge(α,p2nγ) for high-spin (J>9/2) deexcitations.

‡ From $\gamma\gamma(\theta)$ in ^{77}Ge β^- decay (11.211 h) for transitions from low-spin levels, from DCO ratios in (α,p2nγ) for high-spin levels. RUL used when level half-lives are known.

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

@ Multiply placed with undivided intensity.

& Multiply placed with intensity suitably divided.

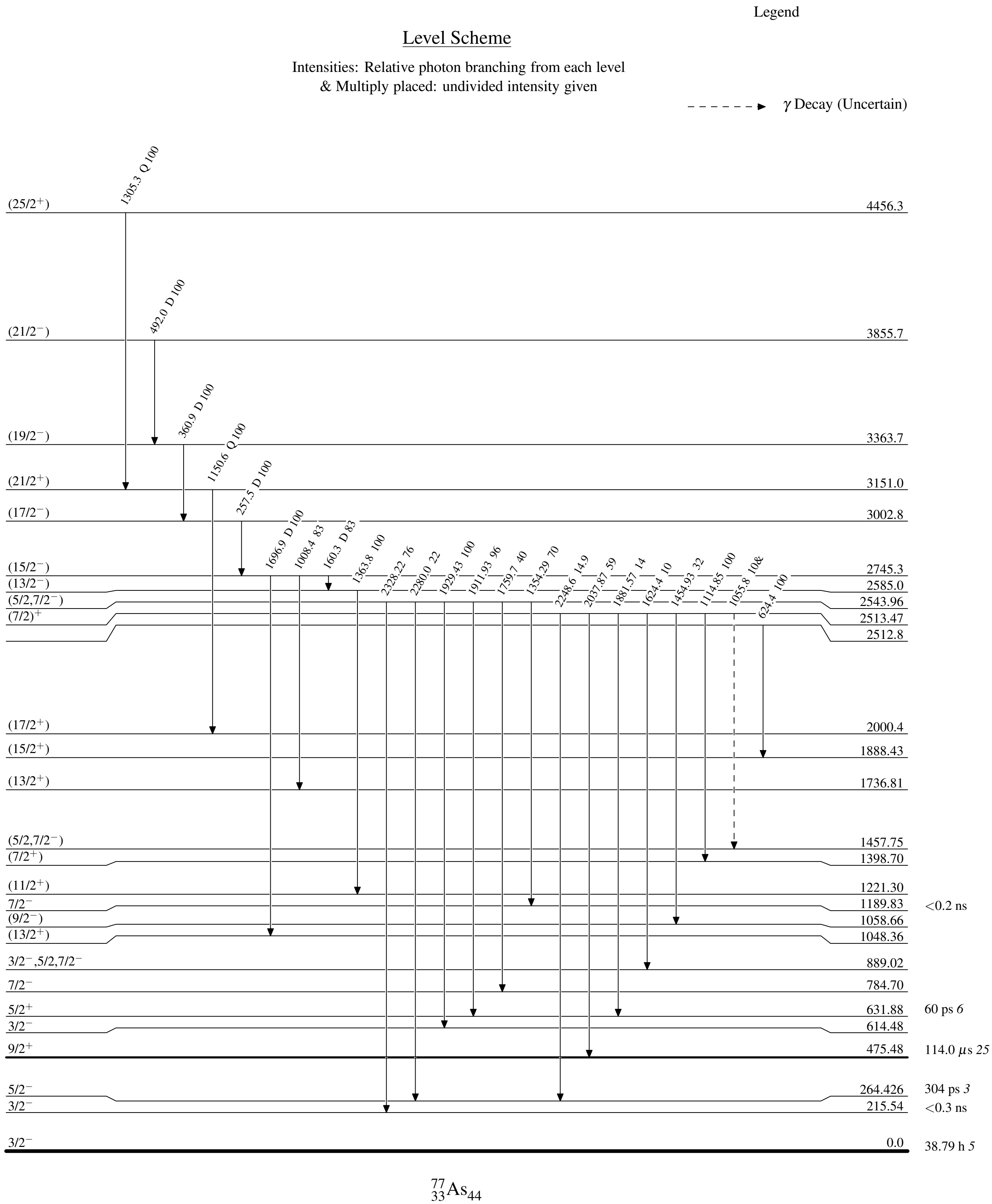
^{a} Placement of transition in the level scheme is uncertain.

$^{77}_{33}As_{44}$-10

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



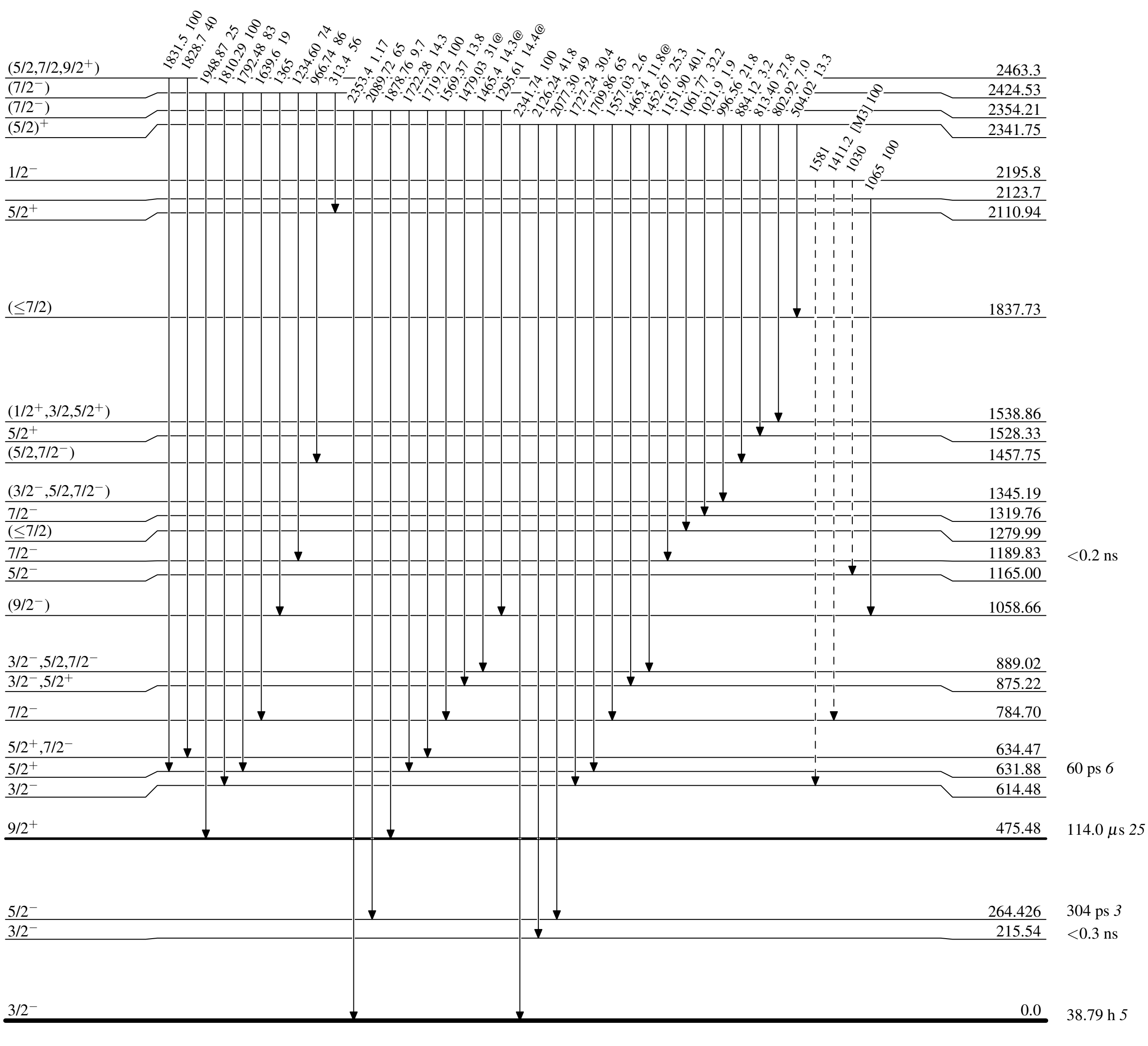
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

γ Decay (Uncertain)



$^{77}_{33}As_{44}$

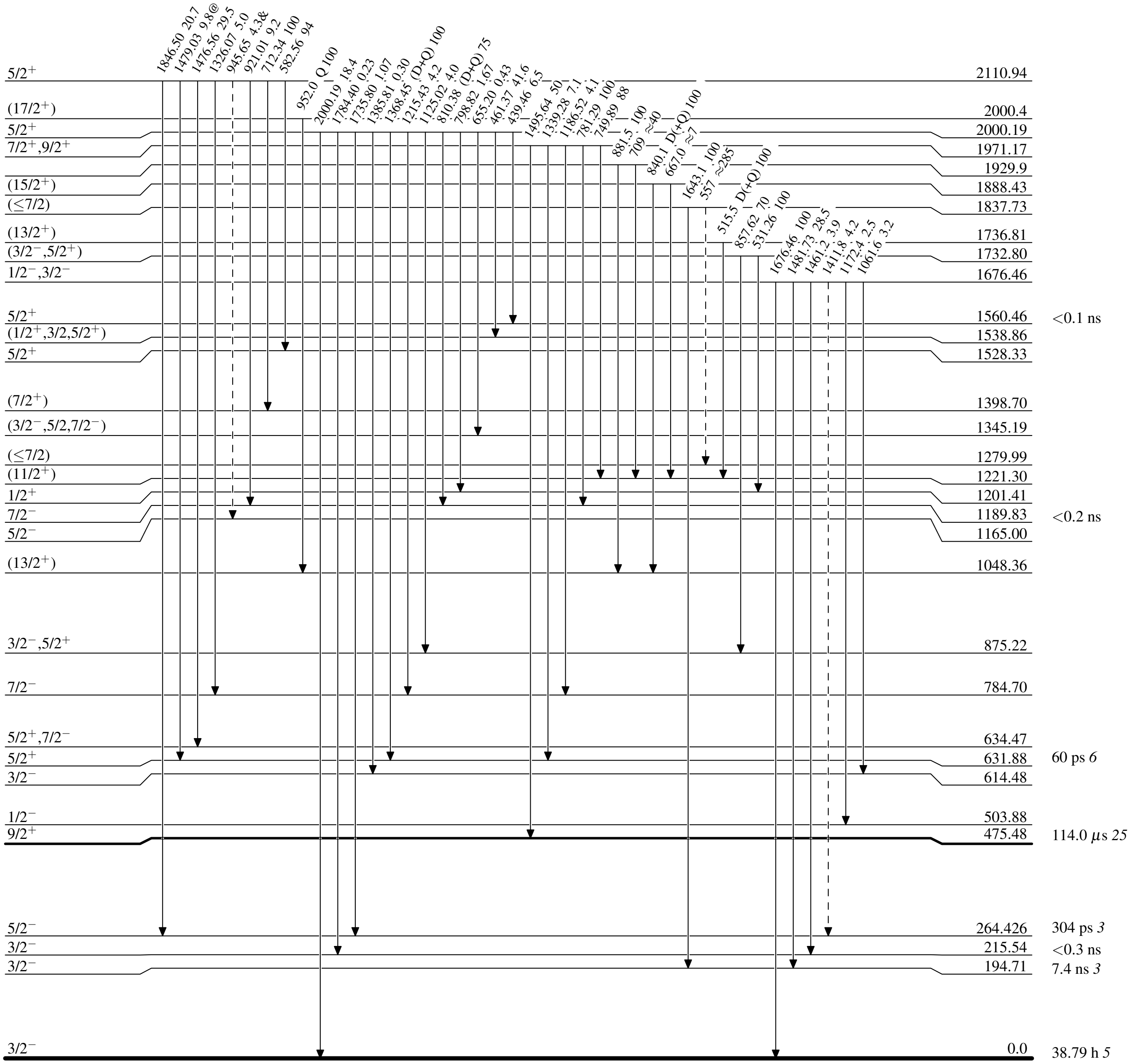
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

γ Decay (Uncertain)

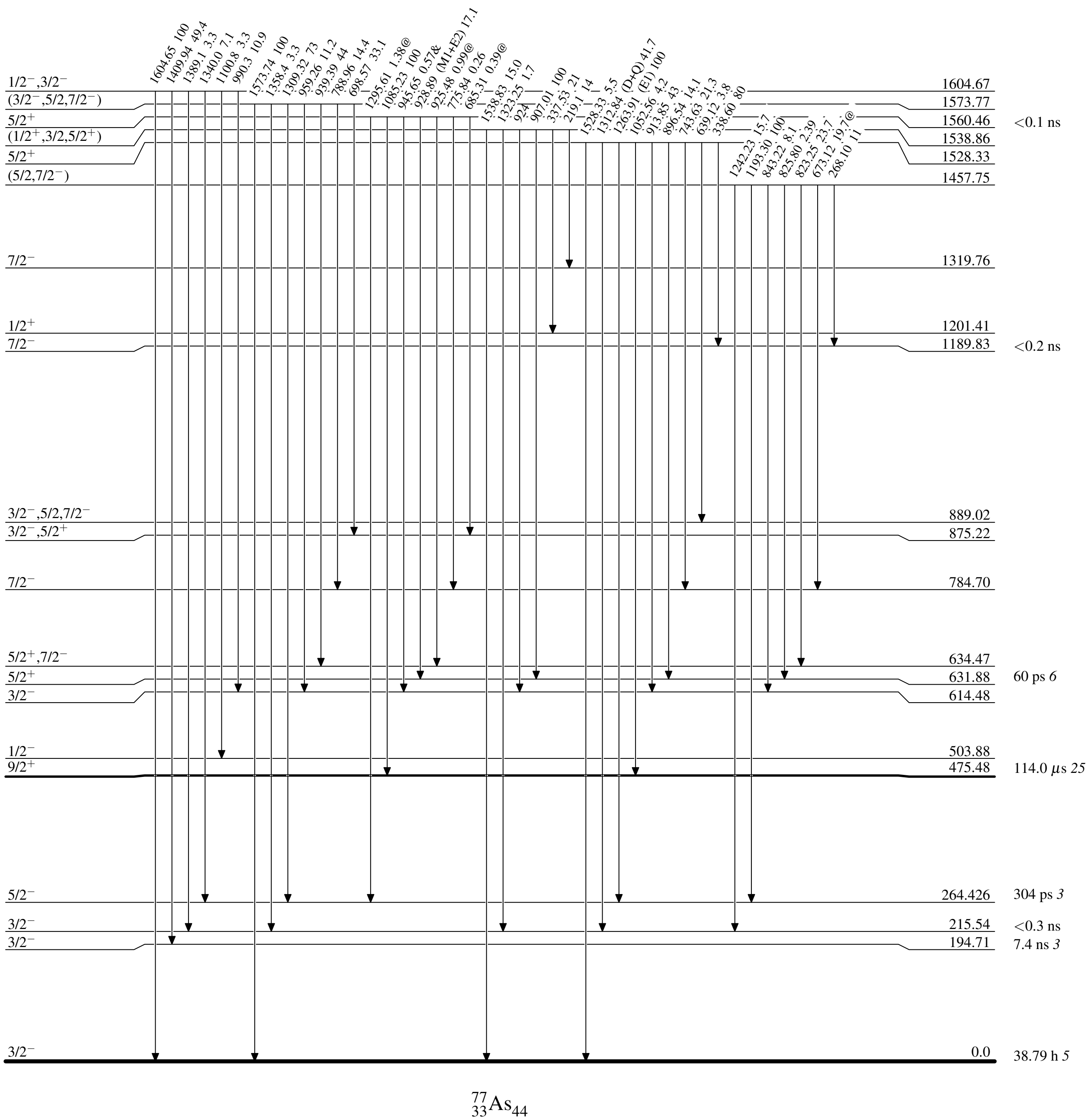


$^{77}_{33}As_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



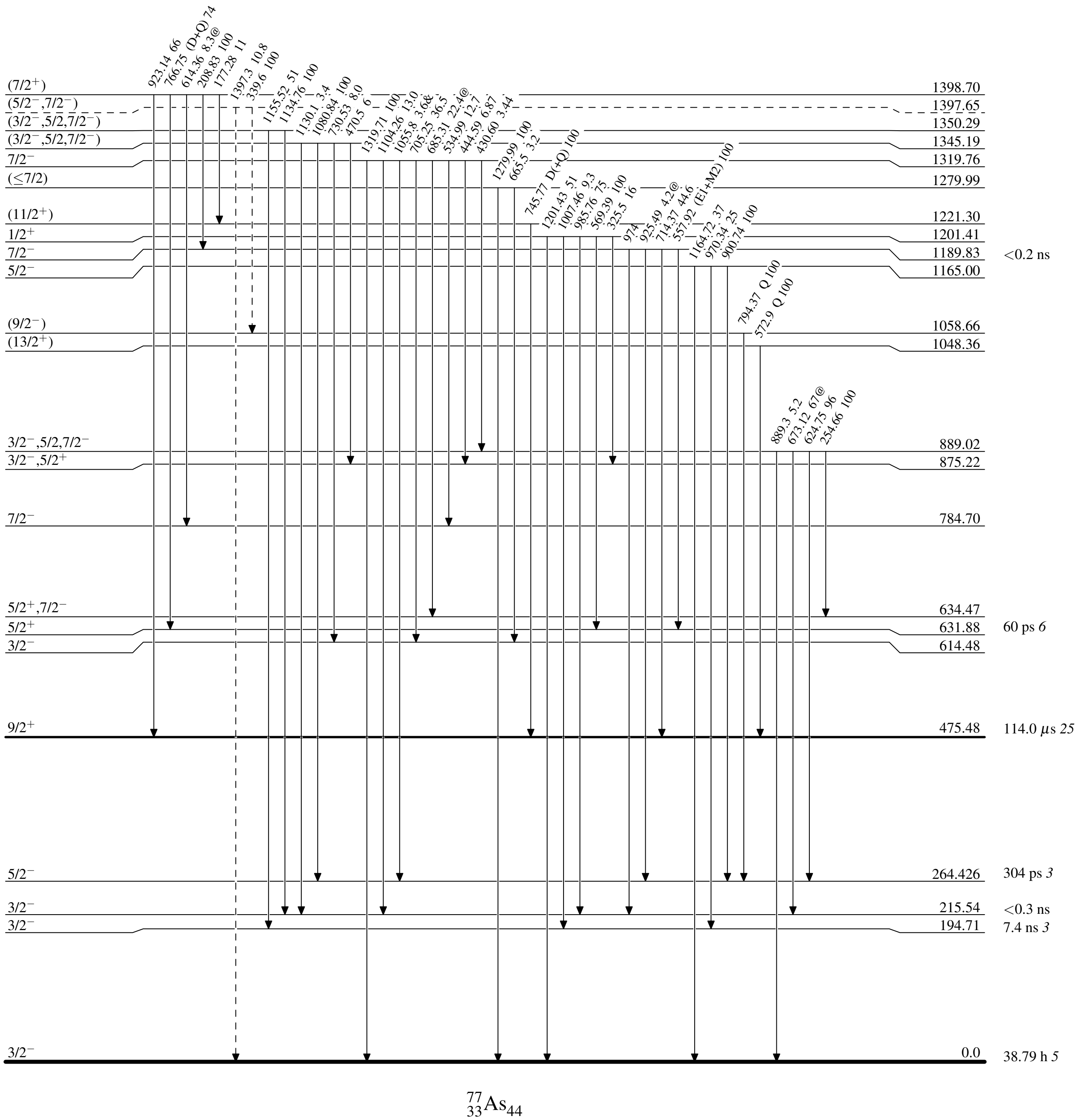
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

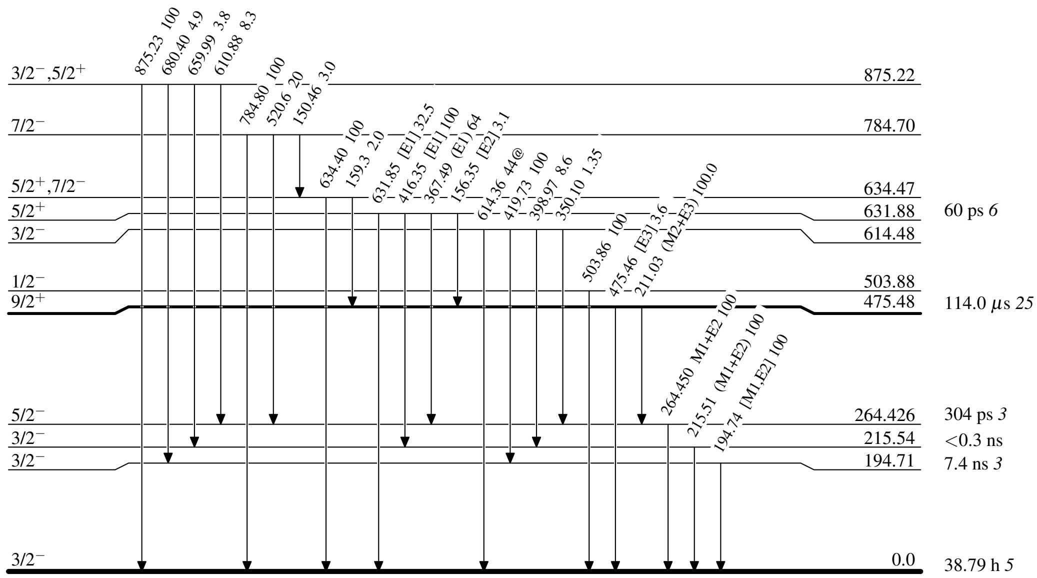
γ Decay (Uncertain)



Adopted Levels, Gammas

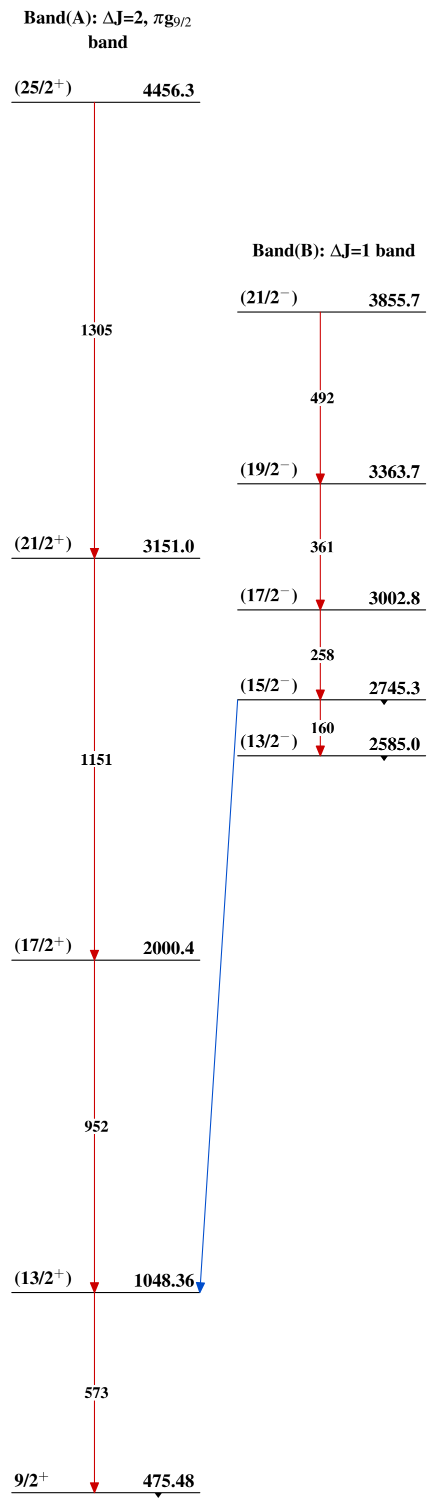
Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



$^{77}_{33}As_{44}$

Adopted Levels, Gammas



$^{77}_{33}As_{44}$