Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 184,29 (2022)	24-Jun-2022

Q(β^-)=1491.51 *4*; S(n)=6587.39 *4*; S(p)=14373.9 *19*; Q(α)=−10787.4 *1* 2021Wa16
Q(α)=−10787.36 *6* (2021Wa16). Value is rounded by evaluators.
S(2n)=17196.59 *4*, S(2p)=26914.6 *3* (2021Wa16).
Mass measurements: 2016Be19, 1997Ro26.
Other measurements:
2012Zh06: ^{9}Be(^{40}Ar,X) E=57 MeV/nucleon, measured fragment yield, momentum distributions at HIRFL facility; deduced target dependence on production cross section.
2015Mo17: ^{9}Be(^{40}Ar,X) E=95 MeV/nucleon, measured momentum distributions of fragments at RIKEN.
2010Wa20: ^{208}Pb(^{36}S,X) E=215 MeV, measured fragment spectrum including ^{31}Si using PRISMA-CLARA apparatus.
Theoretical calculations: 40 primary references for structure and one for decay characteristics retrieved from the NSR database (www.nndc.bnl.gov/nsr/) are listed under 'document records'.
Additional information 1.

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Identification of T=3/2 isospin (quadruplet) states in A=31 nuclei

 31Si        31P            ΔE(1)    31S             ΔE(2)
   0,3/2+    6380,3/2+                 6281,3/2+
 752,1/2+    7141,1/2+        +9       6975,1/2+        -58
1695,5/2+    8106,(5/2)+      +31
2317,3/2+    8738,3/2+        +41
3133,7/2+    9413,(7/2-)      -100

ΔE(1)=E(31P)-E(31Si)-6380
ΔE(2)=E(31S)-E(31P)-6281
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^{31}Si Levels

Cross Reference (XREF) Flags

A	^{31}Al β^- decay (644 ms)	E	^{29}Si(t,p)	I	^{30}Si(d,pγ)
B	^{32}Al β^-n decay (32.1 ms):?	F	^{30}Si(n,γ) E=thermal	J	^{30}Si(t,d),(pol t,d)
C	^{18}O(^{18}O,αnγ)	G	^{30}Si(n,γ),(n,n):resonances	K	^{31}P(μ^-,ν)
D	^{28}Si(^{18}O,^{15}O)	H	^{30}Si(d,p),(pol d,p)	L	^{31}P(n,p)

E(level)†	J$^\pi$#	T$_{1/2}$‡	XREF	Comments
0.0	3/2$^+$	157.24 min *20*	A CDEF HIJ L	%β^-=100 J$^\pi$: L(pol d,p)=L(pol t,d)=2 from 0$^+$ and L-1/2 transfer from analyzing powers. T$_{1/2}$ from weighted average of 157.16 min *20* (2017Da28), 163.0 min *58* (1993Mc05), 157.47 min *50* (1989Ab05, uncertainty increased from 0.012 min to 0.50 min by evaluators to consider systematic uncertainties), 157.2 min *6* (1968Re04), 157.2 min *6* (Osterr. Akad. Wiss., Math.-Naturw. Kl., Anz 174, 575 (1965)), 158.4 min *12* (1958Gu09), 159 min *1* (1952Mo12), 157.3 min *5* (1952De35), 157.1 min *7* (Wennerblom et al., Svensk Kem Tid 63, 207 (1951)), 155.5 min *10* (1950Lu01), 157.3 min *13* (Cichocki et al., Compt Rend 207, 423 (1938)), and 170 min *10* (1937Ne02), with reduced χ^2=0.92. Other: 2150-180 min (1934Fe01). Adopted neutron stripping spectroscopic factor=0.75 *9* (1977En02).
752.23 *3*	1/2$^+$	0.53 ps *12*	A CDEF HIJKL	J$^\pi$: L(d,p)=L(t,d)=0 from 0$^+$.

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Adopted Levels, Gammas (continued)

^{31}Si Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
				Adopted neutron stripping spectroscopic factor S=0.46 *21* (1977En02).
1694.91 *4*	5/2+	0.57 ps *15*	A CDEF HIJK	Jπ: L(d,p)=2 from 0+ and L+1/2 transfer from analyzing power; spin=5/2 from γγ(θ) in (d,pγ). Adopted neutron stripping spectroscopic factor S=0.04 *2* (1977En02).
2316.86 *9*	3/2+	38 fs *17*	A C EF HIJKL	Jπ: L(d,p)=2 from 0+ and L-1/2 transfer from analyzing power; spin=3/2 from γγ(θ) in (d,pγ). Adopted neutron stripping spectroscopic factor S=0.06 *2* (1977En02).
2788.09 *6*	5/2+	14 fs *14*	A C EF HIJ	XREF: E(2799). Jπ: L(d,p)=L(pol t,d)=2 from 0+ and L+1/2 from analyzing power in (pol t,d).
3133.11 *23*	7/2−	0.37 ps *8*	CDE HIJK	Jπ: L(pol d,p)=3 and L+1/2 transfer from analyzing power; J=7/2 also from γγ(θ) in (d,pγ). Adopted neutron stripping spectroscopic factor S=0.71 *13* (1977En02).
3532.92 *3*	3/2−	<10 fs	CDEF HIJK	Jπ: L(pol d,p)=L(pol t,d)=1 from 0+ and L+1/2 transfer from analyzing powers. Adopted neutron stripping spectroscopic factor S=0.52 *9* (1977En02).
3873.6 *7*	(7/2+)		C E H	Jπ: L(d,p)=(4) from 0+; 3874.2γ to 3/2+.
4261.0 *15*	3/2+,5/2+		C E H	Jπ: L(d,p)=2 from 0+.
4382.38 *3*	3/2−		C EF HI K	Jπ: spin=3/2 from γγ(θ) in (d,pγ); L(d,p)=1 from 0+. Adopted neutron stripping spectroscopic factor S=0.15 *4* (1977En02).
4690.5 *16*			E H	E(level): from (d,p). Other: 4688 *10* from (t,p).
4719.1 *3*	1/2+		C E H K	E(level): from (d,p). Other: 4716.5 *20* from Eγ. Jπ: L(d,p)=0 from 0+.
4943.5 *17*			C E H	XREF: E(4940)H(4931). Jπ: 2155γ and 3249γ to 5/2+; 7/2.
4967.5 *9*			C E H	XREF: E(4964)H(4963).
4997.1 *10*			C H L	XREF: H(4992)L(5000).
5281.37 *4*	(1/2)−		C EF H K	Jπ: L(d,p)=1 from 0+ and 1/2− from shell-model calculations.
5311.1 *15*			C E H	
5442.9 *13*	5/2−,7/2−		C e H	XREF: e(5439). Jπ: L(d,p)=3 from 0+.
5451 *3*			C e	XREF: e(5439).
5594 *10*			E	E(level): from (t,p).
5600.2 *20*			C e H	XREF: e(5605)H(5604).
5610.9 *14*			C e	XREF: e(5605).
5656.2 *20*			C E H	XREF: E(5655)H(5647).
5676.9 *15*			C E H	XREF: E(5675)H(5678).
5730 *10*			E	
5791.2 *20*			C	
5818 *10*	(1/2+)		E H	E(level): weighted average of 5816 *10* from (t,p) and 5819 *10* from (d,p). Jπ: L(d,p)=(0) from 0+.
5836 *3*			C	
5856 *3*			C e	XREF: e(5868).
5873.15 *7*	1/2−,3/2−		eF H	XREF: e(5868). Jπ: L(d,p)=1 from 0+.
5957.92 *18*	(1/2−,3/2,5/2+)		EF H	Jπ: L(d,p)=(1,2) from 0+.
5984.2 *19*	(3/2+,5/2+)		C E H	Jπ: L(d,p)=(2) from 0+.
6071.9 *10*	3/2+,5/2+		E H	E(level): from (d,p). Other: 6068 *10* from (t,p). Jπ: L(d,p)=2 from 0+.

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Adopted Levels, Gammas (continued)

^{31}Si Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
6106 *1*	5/2⁻,7/2⁻		E H	E(level): from (d,p). Other: 6107 *10* from (t,p). Jπ: L(d,p)=3 from 0⁺.
6250.3 *20*	3/2⁺,5/2⁺		C E H	XREF: E(6248)H(6241). Jπ: L(d,p)=2 from 0⁺.
6285 *10*			H	
6350 *4*			E H	E(level): weighted average of 6340 *10* from (t,p) and 6351 *4* from (d,p).
6418.3 *20*	(5/2⁻,7/2⁻)		C H	XREF: H(6415). Jπ: L(d,p)=(3) from 0⁺.
6450 *10*			E	
6461.4 *10*	(3/2⁺,5/2⁺)		e H	XREF: e(6468). E(level): from (d,p). Jπ: L(d,p)=(2) from 0⁺.
6473 *4*			C e	XREF: e(6468).
6490.9 *13*			H	
6584.3 *21*	5/2⁻,7/2⁻		C E H	XREF: E(6576). E(level): other: 6584.0 *10* from (d,p). Jπ: L(d,p)=3 from 0⁺.
(6587.40 *3*)	1/2⁺		F	Jπ: s-wave neutron capture in 0⁺ g.s. of ^{30}Si.
6592.22 *3*	1/2⁻[@]	1.90 eV *7*	G	
6602.06 *6*			GH	E(level): weighted average of 6602.06 *4* from (n,γ) and 6600.6 *10* from (d,p).
6636.1 *16*			H	E(level): weighted average of 6650 *10* from (t,p) and 6636.1 *16* from (d,p).
6648.8			G	
6661.7 *14*			C e h	XREF: e(6650)h(6661).
6765.1 *8*	1/2⁺	11.00 keV *30*	G	Jπ: L=0 and R-matrix fit in neutron resonances.
6771.8 *4*	[3/2](+)		GH	E(level): from (n,γ):resonances. Other: 6771 *2* from (d,p). Jπ: L=(2) and R-matrix fit in neutron resonances.
6792.9 *12*			C H	E(level): other: 6790.9 *12* from (d,p).
6815.0 *4*	3/2⁺,5/2⁺		E GH	XREF: E(6810). E(level): weighted average of 6814.1 *5* from (d,p) and 6815.1 *2* from (n,γ):resonances. Other: 6810 *10* from (t,p). Jπ: L(d,p)=2 from 0⁺; also L=2 in (n,γ):resonances.
6876.8 *14*			e H	XREF: e(6874). E(level): from (d,p).
6880.6 *3*	3/2⁻[@]	0.260 keV *20*	e G	XREF: e(6874). E(level): from (n,γ):resonances.
6887 *3*			C	
6915.5 *6*	3/2⁺,5/2⁺		H	Jπ: L(d,p)=2 from 0⁺.
6954.2 *11*	3/2⁺,5/2⁺		H	Jπ: L(d,p)=2 from 0⁺.
6987.4 *4*	1/2⁻[@]	1.31 keV *25*	G	
7012.2 *11*	(1/2⁻,3/2⁻)		H	Jπ: L(d,p)=(1) from 0⁺.
7034.0 *18*			C	
7111 *3*			C	
7164 *10*	(3/2⁺,5/2⁺)		H	Jπ: L(d,p)=(2) from 0⁺.
7207 *2*			H	
7212.2 *6*	3/2⁺,5/2⁺[@]		G	
7225.7 *16*			C	
7269.7 *7*	[3/2⁺,5/2⁺][@]		GH	E(level): weighted average of 7269.9 *7* from (n,γ) and 7268.5 *19* from (d,p).
7309.1 *7*	3/2⁻[@]		GH	E(level): from (n,γ):resonances. Other: 7310.6 *14* from (d,p). Jπ: other: (3/2⁺,5/2⁺) from L(d,p)=(2) is inconsistent if the same levels are populated.

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Adopted Levels, Gammas (continued)

^{31}Si Levels (continued)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
7359.1 *7*	[1/2−]@	0.86 keV *13*	G	
7369.3 *8*	[1/2−]@	0.52 keV *10*	GH	XREF: H(7365).
7372.6 *8*	[1/2−]@	0.60 keV *12*	G	
7405.2 *8*	3/2−@	20.8 keV *8*	GH	XREF: H(7401).
7409.1 *17*			H	
7438.3 *4*	3/2+,5/2+@		GH	E(level): from (d,p). Other: 7438.5 *8* from (n,γ). Jπ: L(n)=2 from (n,γ):resonances; L(d,p)=2 or 3 reported in different (d,p) measurements. It is assumed that the same level is populated in (d,p) and (n,γ):resonances.
7484 *3*			C H	XREF: H(7483).
7536.0 *10*	1/2−@	6.0 keV *10*	G	
7544 *3*			C	
7564 *10*	(3/2+,5/2,7/2−)		H	Jπ: L(d,p)=(2,3) from 0+.
7582 *3*			C	
7642 *10*	(3/2+,5/2,7/2−)		H	Jπ: L(d,p)=(2,3) from 0+.
7718 *10*			H	
7732.1 *16*	1/2+	7.50 keV *50*	G	Jπ: L=0 and R-matrix fit in neutron resonances.
7766.3 *12*	3/2+,5/2+@	5.00 keV *50*	GH	E(level): weighted average of 7766.7 *12* from (n,γ):resonances and 7765 *2* from (d,p).
7822.1 *12*	1/2−@	7.9 keV *13*	GH	E(level): from (n,γ):resonances. Other: 7823 *10* from (d,p).
7848.5 *13*	[3/2+,5/2+]@	4.2 keV *10*	G	
7856.7 *13*	[3/2−]@	5.0 keV *16*	G	
7883.1 *13*	1/2−@	9.0 keV *30*	G	
7900.6 *13*	3/2−@	34.4 keV *34*	G	
7904.6 *8*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
7927.3 *13*	1/2−@	5.8 keV *20*	G	
7944.2 *14*	[3/2+,5/2+]@		G	
7954.9 *14*	[3/2−]@	5.40 keV *12*	G	
7991 *4*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
8016.6 *16*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
8034.9 *12*	5/2−,7/2−		H	
8071 *3*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
8115.9 *13*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
8140 *14*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
8165.2 *15*	5/2−,7/2−		H	Jπ: L(d,p)=3 from 0+.
8220 *14*			H	
8240 *14*	(5/2−,7/2−)		H	Jπ: L(d,p)=(3) from 0+.
8359 *3*	5/2−,7/2−		C h	Jπ: L(d,p)=3 from 0+.
8389 *4*			C	
8570 *14*	3/2+,5/2+		H	Jπ: L(d,p)=2 from 0+.
8605 *3*	3/2+,5/2+		H	Jπ: L(d,p)=2 from 0+.
8648 *3*			H	
8710 *14*	(5/2−,7/2−)		H	Jπ: L(d,p)=(3) from 0+.
8780 *14*	(3/2+,5/2+)		H	Jπ: L(d,p)=(2) from 0+.
8830 *14*	(1/2−,3/2−)		H	Jπ: L(d,p)=(1) from 0+.
8850 *14*			H	
8926 *3*	(1/2−,3/2−)		C H	XREF: H(8920). Jπ: L(d,p)=(1) from 0+.
8967 *7*	(1/2−,3/2−)		H	Jπ: L(d,p)=(1) from 0+.
9217 *3*	(3/2+,5/2+)		C H	XREF: H(9230). Jπ: L(d,p)=(2) from 0+.

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Adopted Levels, Gammas (continued)

^{31}Si Levels (continued)

E(level)[†]	XREF
9324 *3*	C
9380 *14*	H

[†] From a least-squares fit to γ-ray energies for levels connected with γ transitions assuming $\Delta E\gamma$=0.5 keV where not given, and from transfer reactions for other levels, unless otherwise noted.
[‡] For low-lying excited states, values are from DSAM in (d,pγ); for resonances, Γ data are from ^{30}Si(n,γ),(n,n):resonances.
[#] In particle-transfer reactions, target $J^{\pi}=0^{+}$ for (d,p) and (t,d) reactions and $1/2^{+}$ for (t,p) reaction.
[@] Adopted from the evaluation of neutron resonances (2018MuZY), with the assignments based on R-matrix analysis except for those in square brackets which are assumed assignments in 2018MuZY based on theoretical predictions.

Adopted Levels, Gammas (continued)

$\gamma(^{31}Si)$

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
752.23	$1/2^+$	752.22 *3*	100	0.0	$3/2^+$	[M1]			B(M1)(W.u.)=0.098 *+28−18* E_γ: others: 752.23 *30* from ^{31}Al β^- decay and 752.2 *2* from (^{18}O,αnγ).
1694.91	$5/2^+$	942.8 *4*	1.10 *25*	752.23	$1/2^+$	[E2]			B(E2)(W.u.)=2.5 *+11−7* E_γ: weighted average of 942.6 *4* from (^{18}O,αnγ) and 943.2 *7* from (n,γ) E=thermal. I_γ: weighted average of 1.2 *4* from (^{18}O,αnγ), 1.01 *25* from (n,γ) E=thermal, and 4.2 *21* from (d,pγ).
		1694.87 *5*	100.0 *21*	0.0	$3/2^+$	M1+E2	+4.4 *10*	0.0001785 *29*	B(M1)(W.u.)=0.00039 *+32−14*; B(E2)(W.u.)=11.5 *+40−2* α(K)=9.35×10^{-6} *14*; α(L)=6.67×10^{-7} *10*; α(M)=4.40×10^{-8} *6* α(IPF)=0.0001685 *27* E_γ: others: 1694.73 *30* from ^{31}Al β^- decay and 1695.0 *3* from (^{18}O,αnγ). I_γ: from (d,pγ). Other: 100 *5* from (n,γ) E=thermal. Mult.,δ: D+Q from $\gamma\gamma(\theta)$ in (d,pγ); E1+M2 ruled out by RUL.
2316.86	$3/2^+$	622.07 *20*	13.9 *10*	1694.91	$5/2^+$	[M1]			B(M1)(W.u.)=0.24 *+17−8* E_γ: weighted average of 621.81 *30* from ^{31}Al β^- decay and 622.19 *20* from (n,γ) E=thermal. Other: 621.5 *15* from (^{18}O,αnγ). I_γ: weighted average of 13.6 *10* (1973Go22) from ^{31}Al β^- decay and 18 *4* from (n,γ) E=thermal. Others: 17 *11* from (^{18}O,αnγ) and 14 *8* from (d,pγ).
		1564.39 *30*	23.8 *22*	752.23	$1/2^+$	[E2]		0.0001260 *18*	B(E2)(W.u.)=47 *+34−15* α(K)=1.103×10^{-5} *15*; α(L)=7.88×10^{-7} *11*; α(M)=5.19×10^{-8} *7* α(IPF)=0.0001141 *16* E_γ: weighted average of 1564.49 *30* from ^{31}Al β^- decay and 1564.2 *4* from (n,γ) E=thermal. Other: 1564.6 *20* from (^{18}O,αnγ). I_γ: from 1973Go22 in ^{31}Al β^- decay (644 ms). Others: 22 *11* from (^{18}O,αnγ), 22 *6* from (n,γ) E=thermal, and 25 *8* from (d,pγ).
		2316.78 *14*	100.0 *25*	0.0	$3/2^+$	M1+E2	+0.41 *22*	0.000395 *14*	B(M1)(W.u.)=0.029 *+21−10*; B(E2)(W.u.)=4 *+6−3* α(K)=4.94×10^{-6} *9*; α(L)=3.53×10^{-7} *7*; α(M)=2.32×10^{-8} *4* α(IPF)=0.000390 *14* E_γ: weighted average of 2316.64 *40* from ^{31}Al β^- decay and 2316.80 *14* from (n,γ) E=thermal. Other: 2315.7 *20* from (^{18}O,αnγ). I_γ: from 1973Go22 in ^{31}Al β^- decay. Others: 100 *17* from (^{18}O,αnγ), 100 *8* from (n,γ) E=thermal, and 100 *8* from

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Adopted Levels, Gammas (continued)

γ(^{31}Si) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
									B(M1)(W.u.)=0.029 *+21−10*; B(E2)(W.u.)=4 *+6−3* α(K)=4.94×10^{-6} *9*; α(L)=3.53×10^{-7} *7*; α(M)=2.32×10^{-8} *4* α(IPF)=0.000390 *14* E_γ: weighted average of 2316.64 *40* from ^{31}Al β^- decay and 2316.80 *14* from (n,γ) E=thermal. Other: 2315.7 *20* from (^{18}O,αnγ). I_γ: from 1973Go22 in ^{31}Al β^- decay. Others: 100 *17* from (^{18}O,αnγ), 100 *8* from (n,γ) E=thermal, and 100 *8* from (d,pγ). Mult.,δ: D+Q from γγ(θ) in (d,pγ); E1+M2 ruled out by RUL.
2788.09	5/2$^+$	472.7[@a]	<4.2[@]	2316.86	3/2$^+$				
		1095.2[@a]	<4.2[@]	1694.91	5/2$^+$				
		2037.5[@]	3.5 *12*	752.23	1/2$^+$	[E2]		0.000340 *5*	B(E2)(W.u.)>2 α(K)=6.66×10^{-6} *9*; α(L)=4.76×10^{-7} *7*; α(M)=3.13×10^{-8} *4* α(IPF)=0.000333 *5* E_γ: other: 2037.7 *30* from (^{18}O,αnγ). I_γ: weighted average of 2.9 *12* from (^{18}O,αnγ) and 5.3 *21* from (d,pγ).
		2787.90 *12*	100.0 *21*	0.0	3/2$^+$	M1+E2	+0.20 *5*	0.000582 *8*	B(M1)(W.u.)=0.06 *+8−4*; B(E2)(W.u.)=1.5 *+19−10* α(K)=3.68×10^{-6} *5*; α(L)=2.63×10^{-7} *4*; α(M)=1.732×10^{-8} *24* α(IPF)=0.000578 *8* E_γ: others: 2787.6 *8* from ^{31}Al β^- decay, 2788.3 *12* from (^{18}O,αnγ), 2790.1 from (d,pγ). I_γ: from (d,pγ). Other: 100 *18* from (^{18}O,αnγ). Mult.,δ: D+Q from γγ(θ) in (d,pγ); E1+M2 ruled out by RUL.
3133.11	7/2$^-$	345.3[#] *5*	0.57[#] *14*	2788.09	5/2$^+$	[E1]			B(E1)(W.u.)=0.00025 *+10−7* I_γ: other: <3.0 from (d,pγ).
		1438.5[#] *3*	100[#] *4*	1694.91	5/2$^+$	(E1)		0.0002278 *32*	B(E1)(W.u.)=0.00062 *+17−11* α(K)=6.92×10^{-6} *10*; α(L)=4.94×10^{-7} *7*; α(M)=3.25×10^{-8} *5* α(IPF)=0.0002203 *31* Mult.: D+Q with δ=−0.11 *10* from (d,pγ); E1+M2 from Δπ, where parity assignments of connecting levels are uniquely established from independent arguments; M2 component not allowed by RUL.
3532.92	3/2$^-$	401.1[@a]	<3.3[@]	3133.11	7/2$^-$				
		745.1 *9*	0.042 *14*	2788.09	5/2$^+$				I_γ: other: <18 from (d,pγ).
		1216.0[a] *5*	<0.070	2316.86	3/2$^+$				

$^{31}_{14}Si_{17}$-7

Adopted Levels, Gammas (continued)

γ(^{31}Si) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[†]	Comments
3532.92	3/2⁻	1837.92 *5*	3.05 *17*	1694.91	5/2⁺				E_γ: other: 1839.6 with Iγ<3.3 from (d,pγ).
		2780.56 *3*	100.0 *34*	752.23	1/2⁺	(E1(+M2))	+0.015 *40*	1.13×10^{-3} *2*	α(K)=2.66×10^{-6} *4*; α(L)=1.900×10^{-7} *27*; α(M)=1.252×10^{-8} *18* α(IPF)=0.001130 *16* E_γ: other: 2780.0 *15* from (^{18}O,αnγ). I_γ: other: 100 *9* from (d,pγ). Mult.,δ: D(+Q) from γγ(θ) in (d,pγ); E1(+M2) from Δπ, where parity assignments of connecting levels are uniquely established from independent arguments.
		3532.74 *8*	2.48 *14*	0.0	3/2⁺				E_γ: other: 3534.4 with Iγ<1.1 from (d,pγ).
3873.6	(7/2⁺)	1086.0[#] *20*	<1.52[#]	2788.09	5/2⁺				
		2179.2[#] *15*	100[#] *8*	1694.91	5/2⁺				
		3874.2[#] *15*	97[#] *8*	0.0	3/2⁺				
4261.0	3/2⁺,5/2⁺	3508.6[#] *15*	100	752.23	1/2⁺				
4382.38	3/2⁻	849.45 *15*	5.4 *6*	3532.92	3/2⁻				
		1594.30 *6*	12.7 *8*	2788.09	5/2⁺				
		2065.6 *6*	1.5 *4*	2316.86	3/2⁺				
		2687.35 *8*	19.8 *20*	1694.91	5/2⁺				I_γ: weighted average of 20.4 *12* from (n,γ) E=thermal and 13 *4* from (d,pγ).
		3629.90 *4*	100 *4*	752.23	1/2⁺				E_γ: other: 3629.8 *20* from (^{18}O,αnγ). I_γ: other: 100 *11* from (d,pγ).
		4382.04 *14*	22.5 *17*	0.0	3/2⁺				I_γ: weighted average of 22.8 *17* from (n,γ) E=thermal and 18 *7* from (d,pγ).
4719.1	1/2⁺	3964[#] *2*	100	752.23	1/2⁺				
4943.5		2155[#] *2*	91[#] *10*	2788.09	5/2⁺				
		3249[#] *3*	100[#] *10*	1694.91	5/2⁺				
4967.5		1093.7[#] *8*	92[#] *8*	3873.6	(7/2⁺)				
		2180[#] *2*	100[#] *53*	2788.09	5/2⁺				
		3274[#] *3*	34[#] *8*	1694.91	5/2⁺				
4997.1		1124.2[#] *15*	13[#] *5*	3873.6	(7/2⁺)				
		1864.1[#] *15*	100[#] *10*	3133.11	7/2⁻				
5281.37	(1/2)⁻	898.6 *7*	0.45 *13*	4382.38	3/2⁻				
		1748.38 *6*	8.7 *5*	3532.92	3/2⁻				
		2493.2[a] *10*	<0.51	2788.09	5/2⁺				
		2964.26 *18*	4.6 *5*	2316.86	3/2⁺				
		3586.2[a] *10*	<0.64	1694.91	5/2⁺				

$^{31}_{14}Si_{17}$-8

Adopted Levels, Gammas (continued)

γ(^{31}Si) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Comments
5281.37	(1/2)$^-$	4528.77 *5*	100.0 *32*	752.23	1/2$^+$	E_γ: weighted average of 4526.4 *20* from (^{18}O,αnγ) and 4528.77 *4* from (n,γ) E=thermal.
		5280.9 *6*	1.53 *26*	0.0	3/2$^+$	
5311.1		2177.9[#] *15*	100	3133.11	7/2$^-$	
5442.9	5/2$^-$,7/2$^-$	2654.6[#] *15*	100[#] *16*	2788.09	5/2$^+$	
		3126.0[#] *25*	<15.6[#]	2316.86	3/2$^+$	
5451		3756[#] *3*	100	1694.91	5/2$^+$	
5600.2		3905[#] *2*	100	1694.91	5/2$^+$	
5610.9		2478.0[#] *15*	100	3133.11	7/2$^-$	
5656.2		3961[#] *2*	100	1694.91	5/2$^+$	
5676.9		2888.7[#] *15*	100	2788.09	5/2$^+$	
5791.2		3003[#] *2*	100	2788.09	5/2$^+$	
5836		4141.2[#] *25*	100	1694.91	5/2$^+$	
5856		3539[#] *3*	100	2316.86	3/2$^+$	
5873.15	1/2$^-$,3/2$^-$	5872.37 *18*	100	0.0	3/2$^+$	
5957.92	(1/2$^-$,3/2,5/2$^+$)	3640.2 *9*	33 *17*	2316.86	3/2$^+$	
		5956.9 *8*	100 *25*	0.0	3/2$^+$	
5984.2	(3/2$^+$,5/2$^+$)	2111[#] *2*	62[#] *23*	3873.6	(7/2$^+$)	
		4287[#] *4*	100[#] *23*	1694.91	5/2$^+$	
6250.3	3/2$^+$,5/2$^+$	4555 *2*	100	1694.91	5/2$^+$	
6418.3	(5/2$^-$,7/2$^-$)	2548.0[#] *25*	100[#] *43*	3873.6	(7/2$^+$)	
		4718[#] *3*	43[#] *14*	1694.91	5/2$^+$	
6473		4156[#] *4*	100	2316.86	3/2$^+$	
6584.3	5/2$^-$,7/2$^-$	3796[#] *3*	38[#] *25*	2788.09	5/2$^+$	
		4889[#] *3*	100[#] *25*	1694.91	5/2$^+$	
(6587.40)	1/2$^+$	629.43 *19*	0.29 *4*	5957.92	(1/2$^-$,3/2,5/2$^+$)	
		714.22 *6*	1.28 *8*	5873.15	1/2$^-$,3/2$^-$	
		1305.99 *4*	25.0 *8*	5281.37	(1/2)$^-$	
		2204.95 *3*	18.7 *7*	4382.38	3/2$^-$	
		3054.33 *3*	100.0 *32*	3532.92	3/2$^-$	
		3798.2 *8*	0.19 *6*	2788.09	5/2$^+$	
		4270.1[a]	<0.096	2316.86	3/2$^+$	
		4892.1[a]	<0.137	1694.91	5/2$^+$	
		5834.2 *6*	0.34 *6*	752.23	1/2$^+$	
		6586.71 *13*	2.16 *19*	0.0	3/2$^+$	
6661.7		2787.7[#] *35*	40[#] *20*	3873.6	(7/2$^+$)	

$^{31}_{14}Si_{17}$-9

Adopted Levels, Gammas (continued)

γ(^{31}Si) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π
6661.7		3873.7[#] *22*	20[#] *13*	2788.09	$5/2^+$
		4966.2[#] *22*	100[#] *20*	1694.91	$5/2^+$
6792.9		1796.2[#] *10*	40[#] *33*	4997.1	
		3658[#] *2*	100[#] *67*	3133.11	$7/2^-$
6887		3016[#] *4*	100[#] *57*	3873.6	$(7/2^+)$
		5189[#] *4*	71[#] *29*	1694.91	$5/2^+$
7034.0		2066.4[#] *15*	100	4967.5	
7111		4794[#] *3*	100	2316.86	$3/2^+$
7225.7		1615.0[#] *12*	100[#] *64*	5610.9	
7225.7		4091[#] *3*	46[#] *27*	3133.11	$7/2^-$
7484		2173[#] *2*	100	5311.1	
7544		4756[#] *3*	100	2788.09	$5/2^+$
7582		3708[#] *3*	100	3873.6	$(7/2^+)$
8359	$5/2^-,7/2^-$	3048[#] *2*	100	5311.1	
8389		4515[#] *4*	100	3873.6	$(7/2^+)$
8926	$(1/2^-,3/2^-)$	3615[#] *2*	100	5311.1	
9217	$(3/2^+,5/2^+)$	4249[#] *3*	100	4967.5	
9324		4356[#] *3*	100	4967.5	

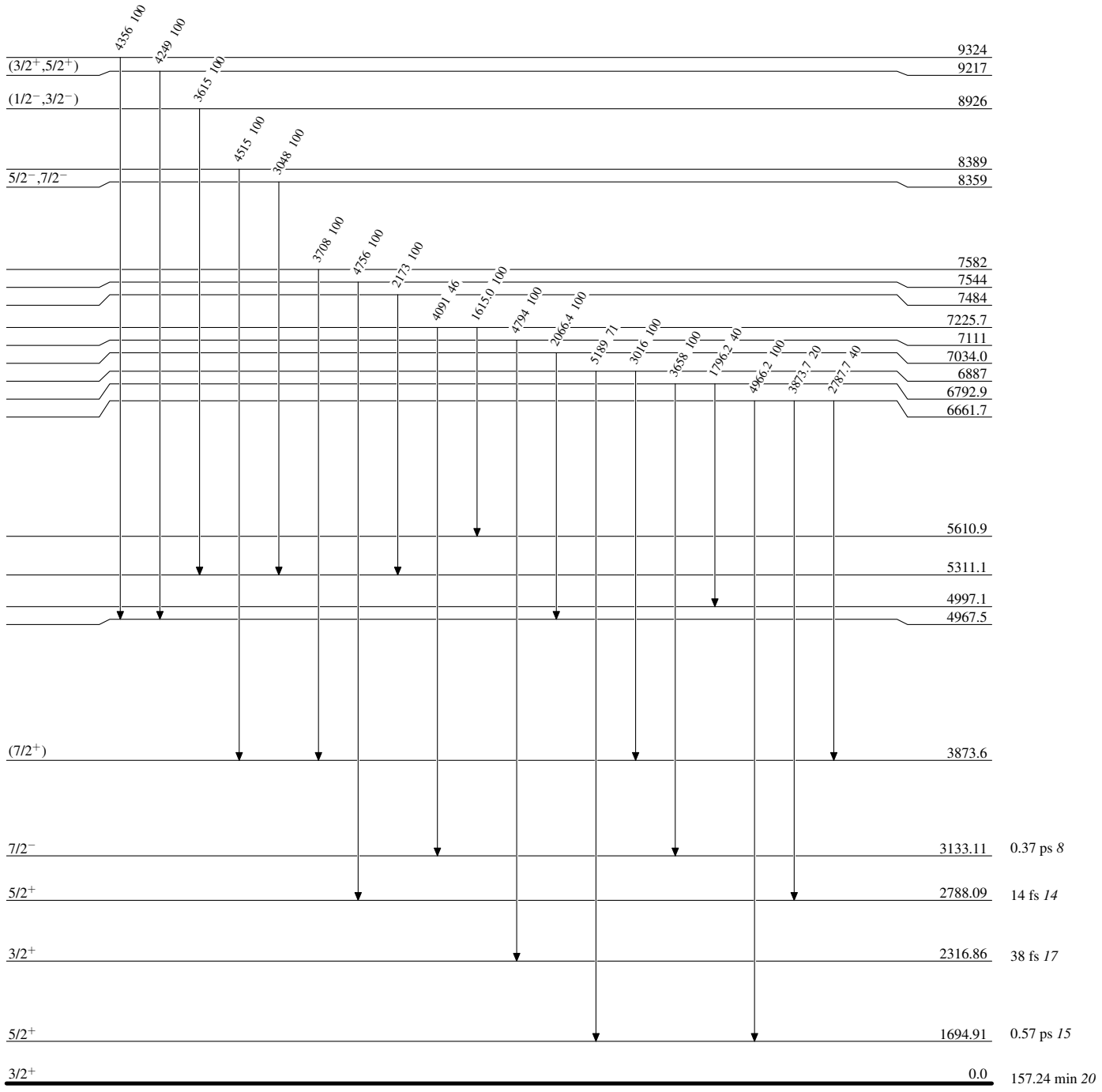
† Additional information 2.
‡ From (n,γ) E=thermal, except as noted.
# From (^{18}O,αnγ).
@ From (d,pγ).
& From angular correlation data in (d,pγ), with electric or magnetic natures determined based RUL where $T_{1/2}$ is known, unless otherwise noted.
a Placement of transition in the level scheme is uncertain.

$^{31}_{14}Si_{17}$-10

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



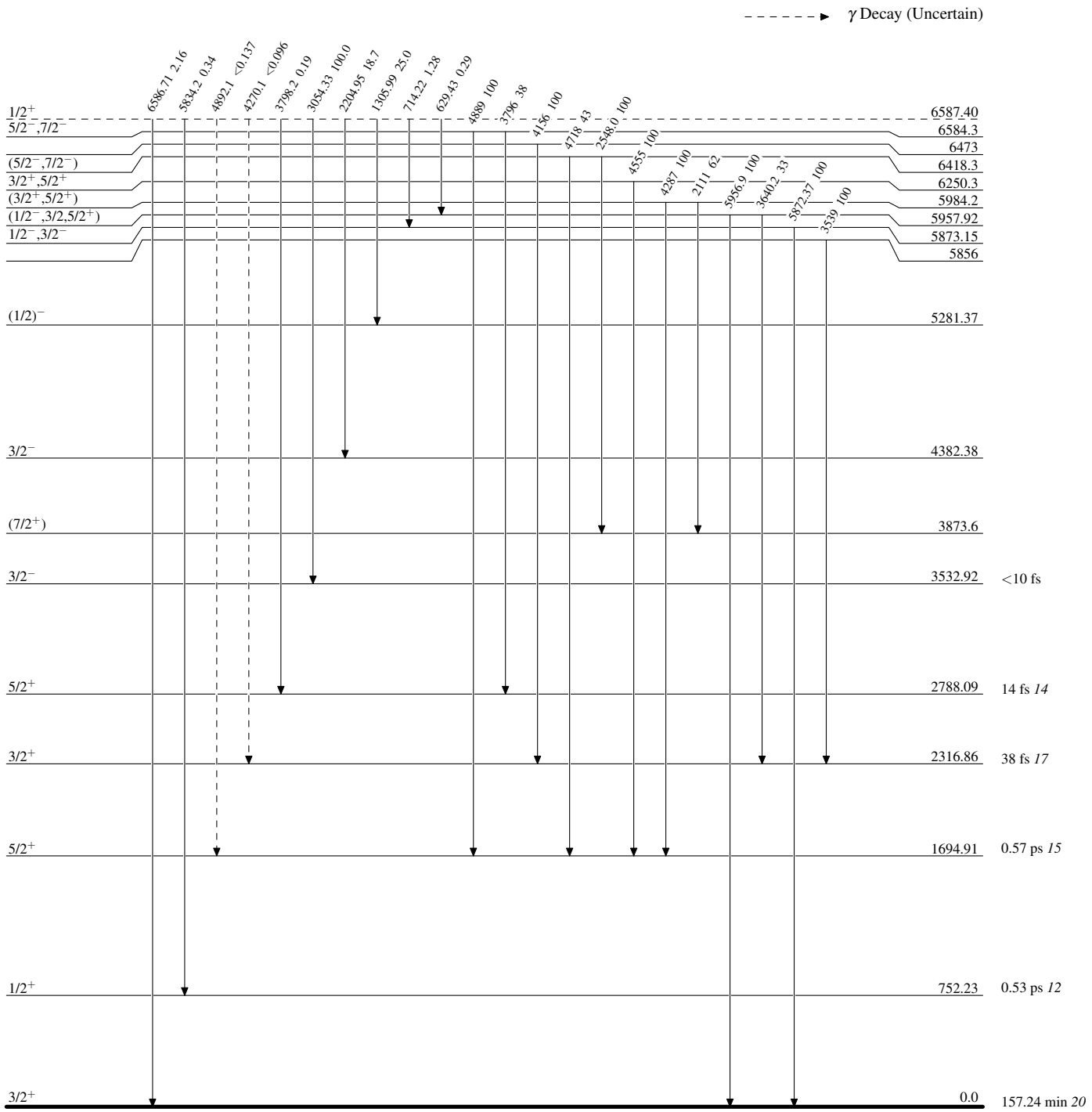
$^{31}_{14}Si_{17}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

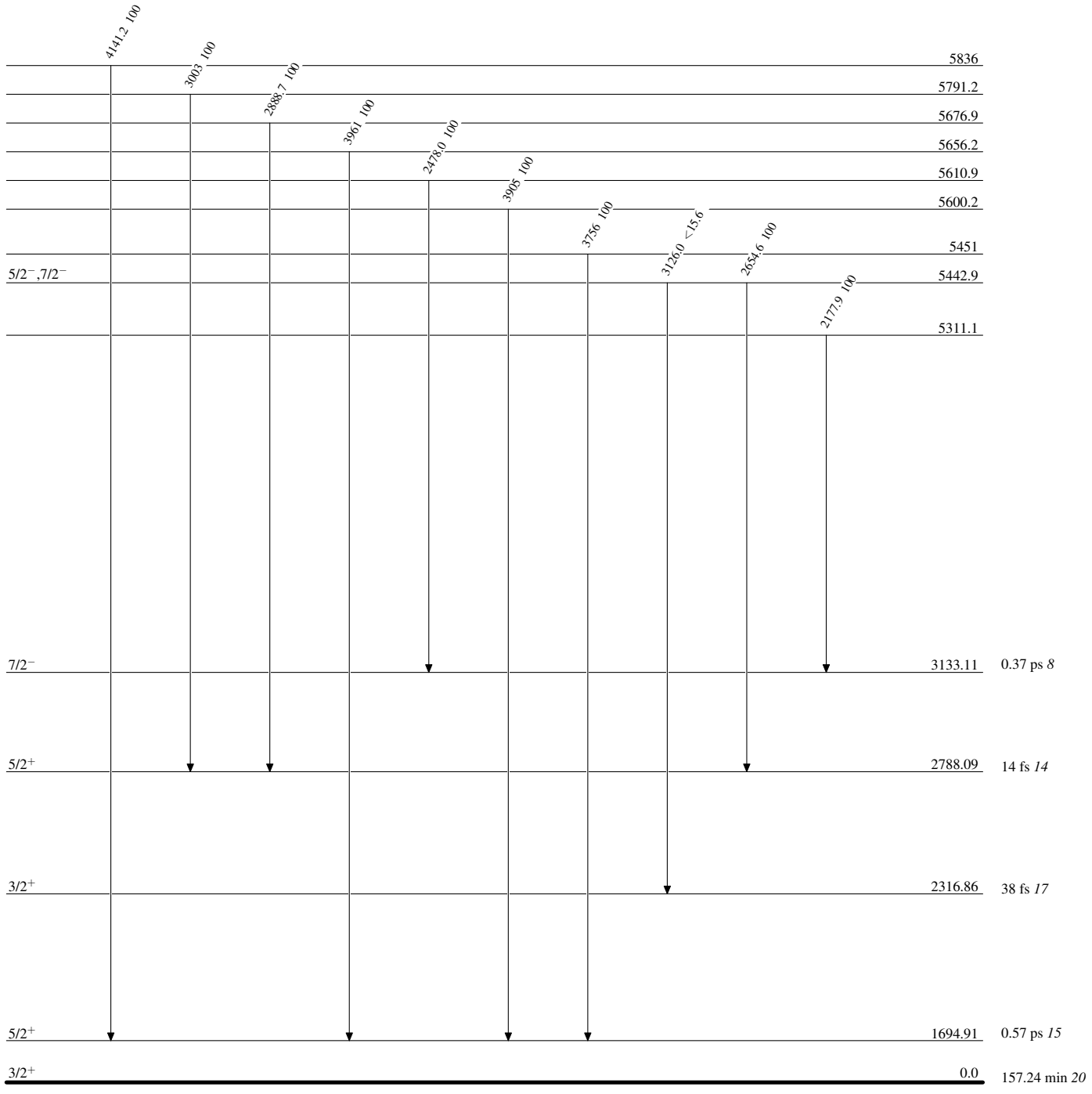


$^{31}_{14}Si_{17}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{31}_{14}Si_{17}$

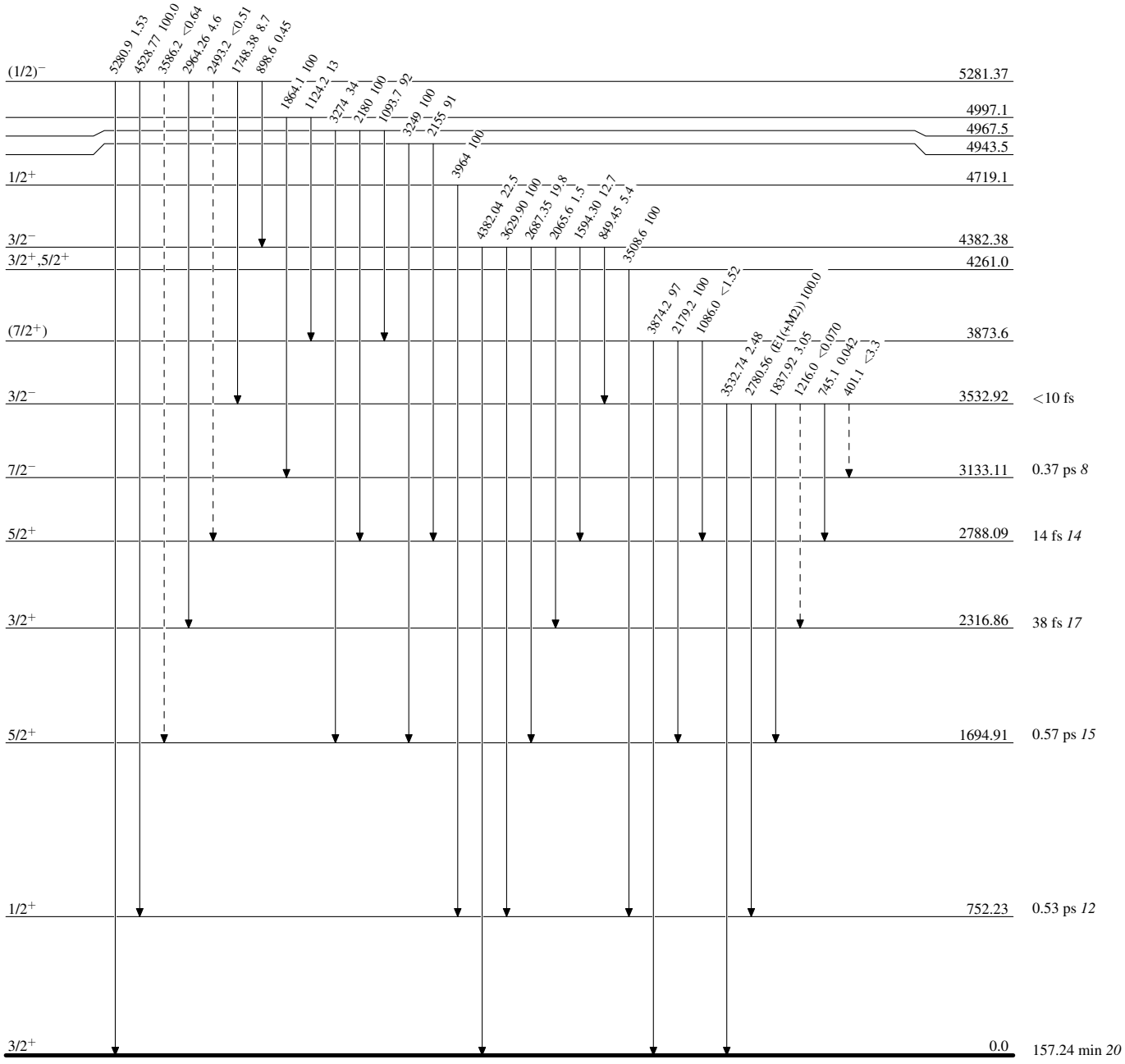
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{31}_{14}Si_{17}$

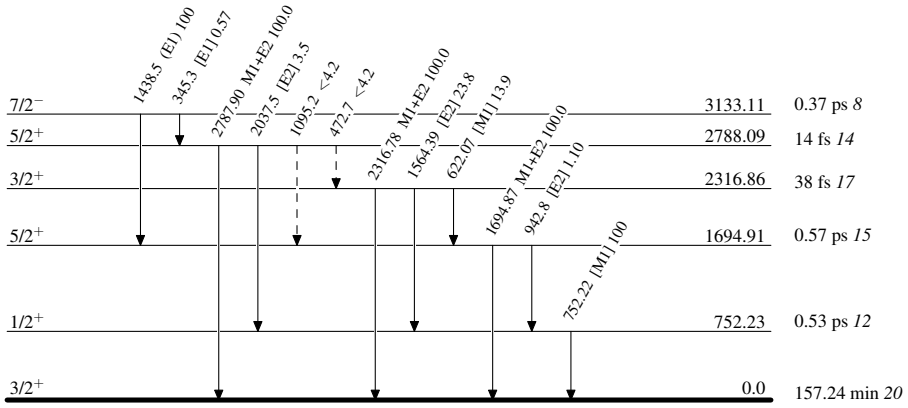
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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