^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171,1 (2021)	1-Jun-2020

Others: 1959Ku79,1960Mo07,1962Br21,1963Ar05,1966We05,1970Bi14,1970We13, 1971Du07,1971Pi08,1972Vi02,1973Ve04,1973Me11,1975An14,1977Ke04, 1983Go21,1983Ke12,2000Ka52,2004Vo21,2004Vo26,2004Vo27,2005Vo22, 2006Ka65,2009Us01,2010Lo05,2014Ca47,2015Ca27,2015De33,2015Ke05, 2016De34,2018Fe04,2018Fe10,2019Ka53,2019Hu08 (to estimate the ^{22}Ne concentration in the targets),2020Le11,2020Wi08.

1989Ba42: ^{22}Ne(p,γ) E=0.6-1.8 MeV. Measured Eγ, $\sigma(\gamma,\theta)$, I$\gamma(\theta)$, DSA.

1979Sm02: ^{22}Ne(p,γ) E=1.11,1.91 MeV. Measured Eγ, σ(Ep,Eγ), I$\gamma(\theta)$, DSA.

2017Ke01: ^{22}Ne(p,γ) E=165, 192, 425, 441 keV. Measured Eγ, Iγ, $\gamma\gamma$-coin in singles and coincidence modes using a 135% HPGe detector surrounded by a 16-fold segmented NaI(Tl) annulus.

1975An14: ^{22}Ne(p,γ) E<2 MeV. Measured mean lifetime by DSA method.

1973Me11: ^{22}Ne(p,γ) E=0.43-1.11 MeV. Measured σ(E; Eγ,$\theta(\gamma)$), DSA.

2019Ka53: ^{22}Ne(p,γ), E=1-3 MeV, Measured γ using Ge(Li) detector. Deduced Center-of-Gravity (CG) of magnetic dipole resonance (MDR) 6.0 MeV on the state of 440 keV and up to 10.2 MeV on the state of 2982 keV. Compared with Brink-Axel hypothesis.

^{23}Na Levels

E(level)[†]	J$^\pi$[#]	T or Γ	Comments
0.0	3/2$^+$		
439.991 *10*	5/2$^+$		
2076.01 *3*	7/2$^+$	24 fs *2*	T or Γ: From 1979Sm02. Others: 19 fs *5* (1973Me11), 29 fs *5* (1975An14), 26 fs *6* (1970Bi14).
2390.732 *18*	1/2$^+$	526 fs *139*	T or Γ: Weighted average of 527 fs *146* (1979Sm02), 589 fs *139* (1975An14), and 402 fs *194* (1971Du07). Uncertainty − lowest input value. Others: 520 fs *416* (1970Bi14), >347 fs (1973Me11).
2639.86 *5*	1/2$^-$	73 fs *9*	T or Γ: Weighted average of 78 fs *12* (1975An14), 70 fs *14* (1970Bi14), 64 fs *12* (1979Sm02), 61 fs *12* (1971Du07), 82 fs *9* (uncertainty 3 in 1983Ke12 from wt. ave. − evaluators take lowest value). Other: 40 fs *7* (1973Me11).
2703.50 *3*	9/2$^+$	65 fs *22*	T or Γ: Weighted average of 45 fs *10* (1973Me11) and 90 fs *11* (1975An14).
2982.06 *4*	3/2$^+$	3.2 fs *7*	T or Γ: Weighted average of 1.9 fs *14* (1973Me11), 2.4 fs *7* (1975An14), and 4.4 fs *7* (1970Bi14). Other value <2.1 fs (1979Sm02).
3677.60 *8*	3/2$^-$	24 fs *3*	T or Γ: Weighted average of 18 fs *3* (1973Me11), 29 fs *5* (1975An14), 30 fs *4* (1979Sm02), and 24 fs *4* (1970Bi14).
3848.07 *4*	5/2$^-$	82 fs *21*	T or Γ: Weighted average of 66 fs *21* (1973Me11), 97 fs *21* (1975An14), 83 fs *21* (1979Sm02), and 80 fs *24* (1970Bi14).
3914.24 *4*	5/2$^+$	8.5 fs *14*	T or Γ: Weighted average of 8 fs *2* (1973Me11), 10 fs *2* (1975An14), 6.9 fs *28* (1979Sm02), and 8.3 fs *14* (1970Bi14).
4429.63 *16*	1/2$^+$	1.4[a] fs *14*	
4774.61 *10*	7/2$^+$	<1.4[&a] fs	
5378.56 *15*	5/2$^+$	<3.5[b] fs	
5741.8 *3*	5/2$^+$	<5[b] fs	J$^\pi$: 5/2 from p$\gamma(\theta)$ measurements of 9396.3 → 5740 → g.s. cascade and transition strength analysis (1989Ba42).
5766.03 *16*	3/2$^+$	<7[b] fs	
5926.8 *3*	7/2$^+$	13[&] fs *5*	J$^\pi$: From p$\gamma(\theta)$ measurements of resonance level → 5926.8 → g.s. cascade and transition strength analysis (1989Ba42).
5964.4 *5*	3/2$^-$	<11[&] fs	
6042.19 *9*	7/2$^-$	6[&] fs *2*	J$^\pi$: From p$\gamma(\theta)$ measurements of resonance level → 6042 → 3677.9, 3847.9 cascade and transition strength analysis (1989Ba42).
6194.6 *2*	5/2$^-$	<70[&] fs	J$^\pi$: p$\gamma(\theta)$ from resonance level → this level implies 5/2,9/2. Sign from γ to 1/2$^-$ and 9/2

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^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

^{23}Na Levels (continued)

E(level)[†]	J$^\pi$[#]	T or Γ	Comments
			excluded by RUL (1989Ba42).
6307.96 *14*			
6354			E(level): From Adopted Levels. Listed to place 2688γ from 9042.4 keV level. Energy rounded to nearest keV.
6577.79 *18*	9/2$^+$,(5/2$^+$)	<11[&] fs	
6618.1 *9*	7/2$^+$,(5/2)$^+$	<0.7[&] fs	
6735.5 *2*	3/2		J$^\pi$: From 1989Ba42, based on feeding from 1/2$^+$ (Ep=1350), and 3/2$^-$ (Ep=661) resonance states.
6819.6 *3*	5/2	<8[&] fs	J$^\pi$: 5/2 from p$\gamma(\theta)$ (1989Ba42).
6867.7 *2*	5/2$^+$,(3/2$^+$)	<6[&] fs	
6920.61 *16*	3/2$^-$		
6947.40 *16*	3/2	<28[&] fs	J$^\pi$: From $\gamma(\theta)$ measurements (1989Ba42).
7070.82 *19*			
7081.9 *3*			
7133.5 *9*			
7190			
7277.1 *3*	7/2,5/2	9[&] fs *6*	J$^\pi$: D+Q γ to 5/2$^+$ and 5/2$^-$.
7385			E(level): From Adopted Levels. Listed to place 2223γ from 9608.2 keV level. Energy rounded to nearest keV.
7412.4 *3*	5/2$^+$,7/2$^+$,9/2$^+$	<35[&] fs	J$^\pi$: γ cascades from resonance state (7/2$^-$) at 9396.4 → 7412 → 7/2$^+$ state at 2076 (1989Ba42).
7451.5 *9*	5/2	<3[&] fs	J$^\pi$: From $\gamma(\theta)$ (1989Ba42).
7487.84 *19*	1/2,(3/2)	<3[&] fs	J$^\pi$: Proposed in 1989Ba42 based on $\gamma(\theta)$ measurements and γ to 1/2$^-$ and 1/2$^+$ states.
7566.2 *3*	5/2,7/2$^+$	<3[&] fs	J$^\pi$: Proposed in 1989Ba42 based on $\gamma(\theta)$ measurements and γ to g.s. (3/2$^+$).
7724.45 *17*			
7750.5 *2*	5/2,7/2$^+$		
7834.13 *19*	7/2,(5/2$^+$)	<3.5[&] fs	J$^\pi$: $\gamma(\theta)$ measurements for γ from 7/2 resonance state, γ to 9/2$^+$, D(+Q) γ to 5/2$^+$ (p,γ).
7872.83 *16*	3/2,(5/2$^+$)	<3.5[&] fs	
7876.2 *9*	5/2	<12[&] fs	
7891.2 *3*	5/2$^+$	<0.7[&] fs	J$^\pi$: From Adopted Levels.
7970			
8060			
8261.0 *5*			
8302.0 *2*			
8360.0 *9*			
8417.43 *18*	3/2	<21[&] fs	
8475.7 *5*			
8611.1 *9*			
8631.0 *9*	3/2,5/2$^+$,7/2$^+$		
8663.8 *7*			E(level): From 1983Go21.
8829.5 *7*			E(level): From 1983Go21.
(8862[‡])	1/2$^+$[@]		E(level): From E$_p$(Lab)=71 keV (2018Fe10 quote from literature). Resonance strength $\omega\gamma \leq 6\times10^{-11}$ eV (2018Fe10). Screening enhancement factor 1.266 (2018Fe10).
(8895[‡])	1/2$^+$[@]		E(level): From E$_p$(Lab)=105 keV (2018Fe10 quote from literature). Resonance strength $\omega\gamma \leq 7\times10^{-11}$ eV (2018Fe10). Screening enhancement factor 1.140 (2018Fe10).
8943.5 *7*	3/2$^+$		E(level): From E$_p$(Lab)=156.2 keV *7* (2015Ca27). Other: E$_r$=151 keV (2017Ke01). J$^\pi$: From 2017Ke01. 2016De34 assume only 3/2$^+$ state was populated by low

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^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

^{23}Na Levels (continued)

E(level)[†]	J$^\pi$[#]	T or Γ	(2J+1)Γ$_p$Γ$_\gamma$/Γ[d]	Comments
				energy proton beam, as 7/2$^-$ state is strongly disfavored by the angular momentum barrier, considering the doublet at 8944 keV with tentative spin-parity of 3/2$^+$ and 7/2$^-$. Resonance strength $\omega\gamma$=2.2×10^{-7} eV *2* (2018Fe10), 1.8×10^{-7} eV *2* (2015Ca27 − erratum), 2.03×10^{-7} eV *40* (2017Ke01), 1.67×10^{-7} eV *+48−40* (2020Le11). Screening enhancement factor 1.074 (2018Fe10).
8975.3 *7*	5/2$^+$			E(level): E$_p$(Lab)=189.5 keV *7* (2015Ca27,2016De34). Other: E$_p$(Lab)=186 keV *3* (2014Ca47), E$_r$=178 keV (2017Ke01). J$^\pi$: From 2017Ke01, based on decay pattern. Resonance strength $\omega\gamma$=2.7×10^{-6} eV *2* (2018Fe10), 2.2×10^{-6} eV *2* (2015Ca27 − erratum), 2.32×10^{-6} eV *32* (2017Ke01), 2.17×10^{-6} eV *+37−35* (2020Le11). Screening enhancement factor 1.055 (2018Fe10).
9042.4[‡] *6*	(7/2,9/2)$^+$[@]			E(level): From E$_p$(Lab)=259.7 keV *6* (2015Ca27). Resonance strength $\omega\gamma$=8.2×10^{-6} eV *7* (2015Ca27-erratum), 9.7×10^{-6} eV *7* (2018Fe10), 8.5×10^{-6} eV *14* (2020Le11). Screening enhancement factor 1.034 (2018Fe10).
9201				E(level): From E$_r$=407 keV (2017Ke01).
9211.0[‡] *8*	3/2$^-$[@]		0.13[f] *3*	E(level): From Ep=435.8 *10* (1973Me11). Also E$_r$=417 keV (2017Ke01). Resonance strength $\omega\gamma$(436 keV)=0.080 eV *7* and 0.079 eV *8* (2015De33), $\omega\gamma$(436 keV)=0.065 eV *15* (deduced value in 2015De33 using data from 1973Me11).
9252.1[‡] *10*	1/2$^+$[@]		0.9[f] *2*	E(level): From Ep=478.9 *10* (1973Me11). Other: Ep=479.3 *18* (2010Lo05). Resonance strength $\omega\gamma$=0.524 eV *51* (2010Lo05), $\omega\gamma$(479 keV)=0.605 eV *62* (2015De33), $\omega\gamma$(479 keV)=0.583 eV *43* (2015Ke05), 0.44 eV *2* and 0.44 eV *5* (2020Le11,2020Wi08).
9396.4 *3*	7/2$^-$		0.06[f] *2*	E(level): From weighted average of Ep=630.5 *10* (1973Me11) and 629.6 *3* (1989Ba42 − calculated value from Ex based on measured Eγ). J$^\pi$: p$\gamma(\theta)$ and from an acceptable fraction for the reduced proton width of the Wigner limit for a lp=3 capture (1989Ba42 − (p,γ)). D+Q γ's to 5/2$^-$ and 9/2$^-$.
9401.2 *4*			0.05	E(level): From Ep=634.7 *4* (1989Ba42).
9404.8 *5*	1/2	65 eV	5.6[e] *6*	E(level): From weighted average of Ep=640.1 *10* (1973Me11) and 638.4 *3* (1989Ba42 − calculated value from Ex based on measured Eγ). J$^\pi$: From $\gamma(\theta)$ (1962Br21). T or Γ: From 1972Du21. Resonance strength $\omega\gamma$(639 keV)=2.46 eV *21* and 2.43 eV *25* (2015De33), $\omega\gamma$(639 keV)=2.8 eV *3* (deduced value in 2015De33 using data from 1977Ke04).
9426.1 *5*	3/2		0.7[e] *2*	E(level): From weighted average of Ep=662.0 *10* (1973Me11) and 660.5 *4* (1989Ba42 − calculated value from Ex based on measured Eγ). Resonance strength $\omega\gamma$(661 keV)=0.032 eV *+24−9* and 0.031 eV *+24−9* (2015De33 − seems a typo for an order of difference compared to literature data); $\omega\gamma$(661 keV)=0.35 eV *1* and 0.285 eV (deduce value in 2015De33 and 2020Wi08, respectively, using data from 1973Me11), 0.47 eV *7* and 11.7 eV *14* (2020Wi08). J$^\pi$: D+Q γ to 1/2$^+$ and 5/2$^+$.
9487.7 *8*	3/2		0.26[e] *8*	E(level): From Ep=725.1 *8* (1973Me11). J$^\pi$: From pγ angular distribution measurements (1973Me11).

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^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

^{23}Na Levels (continued)

E(level)[†]	Jπ[#]	T or Γ	(2J+1)$\Gamma_p\Gamma_\gamma/\Gamma$[d]	Comments
9608.2[‡] *2*	3/2+[@]		14[f] *5*	E(level): From weighted average of Ep=851.4 *7* (1973Me11) and 851.1 *2* (1989Ba42 – calculated value from Ex based on measured Eγ).
9652.2[‡] *10*	3/2+,5/2+[@]		3.6[f] *18*	E(level): From Ep=897.1 *10* (1973Me11).
9655.6 *10*			2.1[e] *10*	E(level): From Ep=900.7 *10* (1973Me11). Jπ: 3/2,5/2 in 1973Me11, based on γ decay. (1/2+) in Adopted Levels.
9674.1 *10*	3/2+,5/2+		1.6[e] *5*	E(level): From Ep=920.0 *10* (1973Me11). Jπ: γ′s to 1/2+ and 7/2+. D+Q γ′s to 3/2+ and 5/2+.
9682.7 *4*	3/2+		0.7[e] *2*	E(level): From weighted average of Ep=927.7 *10* (1973Me11) and 929.1 *3* (1989Ba42 – calculated value from Ex based on measured Eγ). Jπ: 3/2 from pγ angular distribution measurements (1973Me11).
9700.9[‡] *10*	3/2+[@]		12[f] *4*	E(level): From Ep=948.0 *10* (1973Me11).
9732.53 *13*	7/2		0.8[e] *2*	E(level): From Ep=981.08 *7* (1989Ba42 – calculated value from Ex based on measured Eγ). Other value: 981.3 *5* (1973Me11). Jπ: D+Q to 5/2+ and 9/2+.
9755.5	3/2+		4.8[e] *14*	E(level): From Ep=1005.1 *10* (1973Me11). Jπ: γ′s to 1/2+, 1/2−, 5/2+, 5/2−.
9815.7 *4*	5/2+		1.8[e] *4*	E(level): From weighted average of Ep=1068.1 *8* (1973Me11) and 1068.0 *4* (1989Ba42 – calculated value from Ex based on measured Eγ). Jπ: γ′s to 1/2+ and 9/2+. D+Q γ to 3/2+.
9835.4[‡] *10*	3/2+[@]		3.0[f] *11*	E(level): From Ep=1088.6 *10* (1973Me11).
9850.1[‡] *5*	1/2+[@]		4.3 *11*	E(level): From weighted average of Ep=1105.0 *10* (1979Sm02) and 1103.8 *5* (1989Ba42 – calculated value from Ex based on measured Eγ).
9890.9 *6*	3/2		3.0 *8*	E(level): From Ep=1146.6 *6* (1979Sm02). Jπ: γ′s to 1/2+, 1/2−, 5/2+, 5/2−.
9917.0 *6*	3/2+,5/2,7/2		1.2 *3*	E(level): From Ep=1173.9 *6* (1979Sm02).
10003.2[‡] *6*	1/2−[@]		2.2 *6*	E(level): From Ep=1264.1 *6* (1979Sm02).
10017.4[‡] *10*	5/2+[@]		21[e] *2*	E(level): From weighted average of Ep=1280.2 *5* (1979Sm02) and 1278.1 *4* (1989Ba42 – calculated value from Ex based on measured Eγ). Resonance strength ωγ(1279 keV)=11.3 eV *10* (2015De33), ωγ(1279 keV)=10.5 eV *10* (deduced value in 2015De33 using data from 1977Ke04), 12.7 eV *7* (singles) and 11.7 eV *14* (coincidences) (2020Wi08).
10049.1 *6*			0.4 *1*	E(level): From Ep=1312.0 *6* (1979Sm02).
10070.9	5/2,7/2		5.5 *14*	E(level): From Ep=1334.6 *6* (1979Sm02). Jπ: Proposed in 1979Sm02 (p,γ), based on γ(θ) measurements.
10075.9[‡] *5*	3/2,7/2[@]		2.4 *6*	E(level): From Ep=1340.1 *5* (1979Sm02). Jπ: 5/2,7/2 in 1979Sm02.
10085.3[‡] *5*	1/2+[@]		1.6 *4*	E(level): From weighted average of Ep=1351.2 *5* (1979Sm02) and 1349.7 *2* (1989Ba42 – calculated value from Ex based on measured Eγ).
10114.8[‡] *5*	1/2+[@]		1.3 *3*	E(level): From Ep=1380.7 *5* (1979Sm02).
10125.9[‡] *5*	5/2[@]		2.8 *7*	E(level): From Ep=1392.3 *5* (1979Sm02).
10164.5 *5*				E(level): From Ep=1432.7 *5* (1979Sm02).
10169.6 *2*	5/2+		5.4 *14*	E(level): From weighted average of Ep=1438.0 *5* (1979Sm02) and 1438.0 *2* (1989Ba42 – calculated value from Ex based on measured Eγ). Jπ: D+Q γ′s to 3/2+ and 7/2+.

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^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

^{23}Na Levels (continued)

E(level)[†]	J$^\pi$[#]	T or Γ	(2J+1)Γ$_p$Γ$_\gamma$/Γ[d]	Comments
10231.7[‡] *4*	5/2$^+$[@]		9 *2*	E(level): From weighted average of Ep=1504.1 *10* (1979Sm02) and 1502.8 *3* (1989Ba42 – calculated value from Ex based on measured Eγ).
10243.7[‡] *14*	1/2$^+$[@]	2450[c] eV	2.2 *6*	E(level): From Ep=1515.5 *14* (1979Sm02).
10281.5 *6*	3/2$^+$		2.8 *7*	E(level): From Ep=1555.0 *6* (1979Sm02). J$^\pi$: γ's to 1/2$^-$ and 7/2$^+$.
10318.0[‡] *6*	3/2$^-$[@]	2000[c] eV	10 *3*	E(level): From Ep(Lab)=1593.2 *6*(1979Sm02). Other: Ep(Lab)=1594.0 *8* (2009Us01).
10338.7[‡] *7*	(1/2$^-$)[@]		2.1 *5*	E(level): From Ep(Lab)=1614.8 *7* (1979Sm02). Other: Ep(Lab)=1614.3 *9* (2009Us01).
10346.1[‡] *7*	5/2$^+$[@]	8[c] eV	9 *2*	E(level): From Ep=1622.5 *7* (1979Sm02). Other: Ep(Lab)=1623.1 *9* (2009Us01).
10353.8[‡] *7*	3/2$^+$[@]	210[c] eV	60 *15*	E(level): From Ep=1630.6 *7* (1979Sm02). Other: Ep(Lab)=1631.2 *9* (2009Us01).
10440.6[‡] *10*	5/2$^+$[@]	25[c] eV	13 *3*	E(level): From Ep=1721.3 *10* (1979Sm02). Other: Ep(Lab)=1721.3 *9* (2009Us01).
10448.7 *12*			3.5 *9*	E(level): From Ep=1729.8 *12* (1979Sm02). Other: Ep(Lab)=1729.9 *10* (2009Us01).
10478.8[‡] *7*	3/2$^+$[@]	470 eV	5.1 *13*	E(level): From Ep=1761.3 *7* (1979Sm02). Other: Ep(Lab)=1761.8 *8* (2009Us01). Γ from 1968Ke11. Γ$_p$=400 eV, Γ$_{p'}$=70 eV.
10501.9[‡] *7*	3/2$^-$[@]	920 eV	6.6 *17*	E(level): From Ep=1785.4 *7* (1979Sm02). Other: Ep(Lab)=1785.5 *11* (2009Us01). Γ from 1968Ke11. Γ$_p$=880 eV, Γ$_{p'}$=40 eV.
10507.8[‡] *7*	1/2$^+$[@]	560[c] eV	1.0 *3*	E(level): From Ep=1791.6 *7* (1979Sm02). Other: Ep(Lab)=1792.3 *11* (2009Us01).
10519.1[‡] *7*	5/2$^+$[@]	100[c] eV	4.4 *11*	E(level): From Ep=1803.4 *7* (1979Sm02). Other: Ep(Lab)=1803.7 *8* (2009Us01).
10534.1 *7*			1.5 *4*	E(level): From Ep=1819.1 *7* (1979Sm02). Other: Ep(Lab)=1819.6 *8* (2009Us01).
10549.2[‡] *9*	5/2$^+$[@]	540 eV	11 *3*	E(level): From Ep=1834.9 *9* (1979Sm02). Other: Ep(Lab)=1835.2 *8* (2009Us01). Γ from 1968Ke11. Γ$_p$=380 eV, Γ$_{p'}$=160 eV.
10574.6[‡] *8*	3/2$^-$[@]	1100 eV	2.3 *6*	E(level): From Ep=1861.4 *8* (1979Sm02). Γ from 1968Ke11. Γ$_p$=1010 eV, Γ$_{p'}$=90 eV.
10616.9 *8*	5/2$^+$,3/2$^+$		7.5 *19*	E(level): From Ep=1905.6 (1979Sm02).
19590.6 *21*	5/2$^+$	1900 eV *800*		T=5/2 E(level),J$^\pi$: Isobaric analogue state of ^{23}F g.s. (1985Ev01), Ep=11291.1 *21*. Γ also from 1985Ev01.

[†] Resonance level energies were deduced using Ep and Sp=8794.10 *2* (2017Wa10). Ep (Lab) are from 1979Sm02 and 1989Ba42, except as noted.

[‡] 2018Fe10 do not see any evidence of the suspected weak resonance. However, new and more stringent upper limits were determined at 90% confidence level.

[#] Assignments for levels up to 5378 keV from Adopted Level and where otherwise noted. Between 5378 and 8631 from 1989Ba42 based on $\gamma(\theta)$ measurements, γ feeding from/to resonance levels/low lying levels, and RUL (for levels with measured/known lifetimes).

[@] From Adopted Levels.

[&] From 1989Ba42.

[a] From 1973Me11.

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^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

^{23}Na Levels (continued)

[b] From 1979Sm02.
[c] Γ from 1968Ke11. $\Gamma_p=\Gamma$.
[d] From 1979Sm02, except where otherwise noted.
[e] From 1977Ke04.
[f] From 1973EnVA, recalibrated on S(p,γ) for Ep=1278 keV.

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
439.991	5/2$^+$	439.986	100	0.0	3/2$^+$	D+Q	+0.09 *4*	Mult.,δ: From γ-ray angular distribution measurements (1962Br21).
2076.01	7/2$^+$	1635.96	91.1 *1*	439.991	5/2$^+$			
		2075.91	8.9 *1*	0.0	3/2$^+$			
2390.732	1/2$^+$	1950.652	34.3 *4*	439.991	5/2$^+$			
		2390.599	65.7 *4*	0.0	3/2$^+$			
2639.86	1/2$^-$	2199.76	<0.2[#]	439.991	5/2$^+$			
		2639.70	100	0.0	3/2$^+$			
2703.50	9/2$^+$	627.48	35.1 *8*	2076.01	7/2$^+$			
		2263.39	64.9 *8*	439.991	5/2$^+$			
2982.06	3/2$^+$	342.20	<0.2[#]	2639.86	1/2$^-$			
		591.32	0.3 *1*	2390.732	1/2$^+$			I_γ: Other: <0.4 (1979Sm02).
		2541.92	41.1 *2*	439.991	5/2$^+$			
		2981.85	58.6 *2*	0.0	3/2$^+$			
3677.60	3/2$^-$	695.53	0.5 *1*	2982.06	3/2$^+$			I_γ: Other: <2 (1979Sm02).
		974.08	<1[#]	2703.50	9/2$^+$			
		1037.71	19.6 *5*	2639.86	1/2$^-$			
		1286.83	1.3 *1*	2390.732	1/2$^+$			
		1601.53	<2[#]	2076.01	7/2$^+$			
		3237.36	78.6 *6*	439.991	5/2$^+$			
		3677.28	<6[#]	0.0	3/2$^+$			
3848.07	5/2$^-$	865.99	2.0 *2*	2982.06	3/2$^+$			
		1144.54	<2[#]	2703.50	9/2$^+$			
		1208.18	4.5 *1*	2639.86	1/2$^-$			
		1771.99	61.1 *7*	2076.01	7/2$^+$			
		3407.81	9.5 *9*	439.991	5/2$^+$			
		3847.72	22.9 *6*	0.0	3/2$^+$			
3914.24	5/2$^+$	932.16	2.3 *2*	2982.06	3/2$^+$			
		1210.71	<0.6[#]	2703.50	9/2$^+$			
		1523.45	1.1 *1*	2390.732	1/2$^+$			I_γ: Other: <5 (1979Sm02).
		1838.15	9.0 *2*	2076.01	7/2$^+$			
		3473.97	8.1 *1*	439.991	5/2$^+$			
		3913.88	79.5 *3*	0.0	3/2$^+$			
4429.63	1/2$^+$	1447.52	<2[#]	2982.06	3/2$^+$			
		1726.06	<2[#]	2703.50	9/2$^+$			
		1789.70	<2[#]	2639.86	1/2$^-$			
		2038.80	9 *3*	2390.732	1/2$^+$			
		2353.49	<2[#]	2076.01	7/2$^+$			
		3989.27	<3[#]	439.991	5/2$^+$			

$^{23}_{11}Na_{12}$-7

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
4429.63	1/2$^+$	4429.17	91 *3*	0.0	3/2$^+$			
4774.61	7/2$^+$	1792.47	<2 [#]	2982.06	3/2$^+$			
		2071.01	3.8 *10*	2703.50	9/2$^+$			
		2134.64	<5 [#]	2639.86	1/2$^-$			
		2698.43	29.4 *12*	2076.01	7/2$^+$			
		4334.18	66.8 *13*	439.991	5/2$^+$			
		4774.08	<5 [#]	0.0	3/2$^+$			
5378.56	5/2$^+$	2396.27	7.1 *6*	2982.06	3/2$^+$			
		2674.89	<2 [#]	2703.50	9/2$^+$			
		2738.52	<2 [#]	2639.86	1/2$^-$			
		3302.30	20.6 *10*	2076.01	7/2$^+$			
		4938.00	57.3 *10*	439.991	5/2$^+$	D+Q	−0.10 *7*	Mult.: A_2=0.22 *5*. δ: or +2.2 *4* (1989Ba42). −0.10 7 value assumed to be associated with spin 5/2 and the other for 3/2.
		5377.89	15.0 *10*	0.0	3/2$^+$	D+Q	−0.20 *9*	Mult.: A_2=−0.46 *9* (1989Ba42). δ: assumed for 5/2 or −2.1 *5* for 3/2 (1989Ba42).
5741.8	5/2$^+$	3101.72	<10 [#]	2639.86	1/2$^-$			
		3350.81	<5 [#]	2390.732	1/2$^+$			
		5301.2	24.7 *14*	439.991	5/2$^+$	D+Q	+0.3 *2*	Mult.: A_2=0.65 *15* and 0.31 *17* (1989Ba42).
		5741.0	75.3 *14*	0.0	3/2$^+$	D+Q	+0.17 *3*	Mult.: A_2=0.00 *4*, −0.10 *6*, and 0.14 *6* (1989Ba42).
5766.03	3/2$^+$	1917.87	1.5 *7*	3848.07	5/2$^-$			
		2783.79	<3 [#]	2982.06	3/2$^+$			
		3062.31	<4 [#]	2703.50	9/2$^+$			
		3125.94	4.4 *9*	2639.86	1/2$^-$			
		3375.03	<3 [#]	2390.732	1/2$^+$			
		3689.70	<3 [#]	2076.01	7/2$^+$			
		5325.38	43 *3*	439.991	5/2$^+$	D+Q	−0.07 *8*	Mult.: A_2=−0.01 *7* (1989Ba42). δ: or −3.4 *10* (1989Ba42).
		5765.25	51 *3*	0.0	3/2$^+$	M1+E2	−0.09 *5*	Mult.: A_2=0.20 *7* (1989Ba42). δ: or +6 *2* (1989Ba42).
5926.8	7/2$^+$	1152.2	1.9 *1*	4774.61	7/2$^+$			
		2012.5	6.7 *3*	3914.24	5/2$^+$			
		2944.54	<2 [#]	2982.06	3/2$^+$			
		3223.06	<2 [#]	2703.50	9/2$^+$			
		3535.78	<2 [#]	2390.732	1/2$^+$			
		3850.4	13.6 *13*	2076.01	7/2$^+$			
		5486.1	24.0 *9*	439.991	5/2$^+$	D+Q	+4.4 *6*	Mult.: A_2=0.41 *3*, A_4=0.23 *4* (1989Ba42).
		5926.0	53.8 *11*	0.0	3/2$^+$	Q(+O)	+0.01 *2*	Mult.: A_2=0.46 *2*, A_4=−0.20 *2* (1989Ba42).

$^{23}_{11}Na_{12}$-8

γ(^{23}Na) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
5964.4	3/2$^-$	1534.8	5 *2*	4429.63	1/2$^+$			
		2286.8	15 *5*	3677.60	3/2$^-$			
		3324.4	50 *10*	2639.86	1/2$^-$	D(+Q)	0.0 *2*	Mult.: A_2=−0.13 *10* (1989Ba42). δ: or −1.4 *7*.
		3573.5	10 *5*	2390.732	1/2$^+$			
		5523.8	10 *4*	439.991	5/2$^+$			
		5963.7	10 *4*	0.0	3/2$^+$			
6042.19	7/2$^-$	2127.84	2.8 *5*	3914.24	5/2$^+$			
		2194.01	49 *2*	3848.07	5/2$^-$	D+Q	−0.13 *3*	Mult.: A_2=−0.45 *5*, −0.45 *2*, −0.50 *3* (1989Ba42).
		2364.46	12 *3*	3677.60	3/2$^-$	(Q)		Mult.: A_2=0.35 *7*. A_4=−0.23 *6* (1989Ba42) gives M1+E2, δ=−0.13 *14*. Mult Q from decay to 3/2$^-$.
		5601.47 *9*	36 *2*	439.991	5/2$^+$	D+Q	+0.17 *6*	Mult.: A_2=+0.06 *13*, −0.06 *5* (1989Ba42).
6194.6	5/2$^-$	2346.4	32 *5*	3848.07	5/2$^-$			
		2516.9	34 *7*	3677.60	3/2$^-$			
		3554.4	23 *5*	2639.86	1/2$^-$			
		6193.7	11 *5*	0.0	3/2$^+$			
6307.96		3916.87	100	2390.732	1/2$^+$			I_γ: From 1979Sm02.
6577.79	9/2$^+$,(5/2$^+$)	2663.38	14 *3*	3914.24	5/2$^+$			
		3873.94	18 *4*	2703.50	9/2$^+$			
		4501.31	43 *5*	2076.01	7/2$^+$	D+Q	−0.25 *10*	Mult.: A_2=−0.64 *10* and δ for 9/2 (1989Ba42).
		6136.92	25 *4*	439.991	5/2$^+$			
6618.1	7/2$^+$,(5/2)$^+$	1843.4	2.8 *1*	4774.61	7/2$^+$			
		2703.7	1.1 *2*	3914.24	5/2$^+$			
		4541.6	1.1 *2*	2076.01	7/2$^+$			
		6177.2	91.2 *6*	439.991	5/2$^+$	D+Q	+0.09 *1*	Mult.: A_2=−0.13 *2*, δ for J(6618)=7/2 (1989Ba42).
		6617.1	3.8 *5*	0.0	3/2$^+$			
6735.5	3/2	3753.1	18 *5*	2982.06	3/2$^+$			
		6294.6	34 *6*	439.991	5/2$^+$			
		6734.4	48 *6*	0.0	3/2$^+$			
6819.6	5/2	2971.3	45 *5*	3848.07	5/2$^-$	D+Q	−0.29 *9*	E_γ: Missing gamma deexcitation intensity Iγ=25 from 6120 level. Mult.: A_2=0.09 *9* (1989Ba42). δ: or +3.1 *10* (1989Ba42).
		3141.8	30 *5*	3677.60	3/2$^-$			
6867.7	5/2$^+$,(3/2$^+$)	3885.29	<10[#]	2982.06	3/2$^+$			
		4163.80	<7[#]	2703.50	9/2$^+$			
		4476.50	<9[#]	2390.732	1/2$^+$			
		6426.7	82 *3*	439.991	5/2$^+$	D+Q	+0.5 *4*	Mult.: A_2=0.64 *15* and 0.48 *15*, A_4=−0.33 *15*, δ for J(6868)=5/2 (1989Ba42).
		6866.6	18 *3*	0.0	3/2$^+$			
6920.61	3/2$^-$	4216.69	<10[#]	2703.50	9/2$^+$			
		6479.64	30 *2*	439.991	5/2$^+$			
		6919.49	70 *2*	0.0	3/2$^+$			

$^{23}_{11}Na_{12}$-9

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
6947.40	3/2	3032.94	9.4 *16*	3914.24	$5/2^+$			
		3964.97	31 *2*	2982.06	$3/2^+$	D(+Q)	+0.1 *2*	Mult.: A_2=0.50 *20* (1989Ba42). δ: or +2.5 *14* (1989Ba42).
		4307.11	8 *2*	2639.86	$1/2^-$			
		4556.18	15 *2*	2390.732	$1/2^+$			
		6506.42	19 *3*	439.991	$5/2^+$			
		6946.27	17 *3*	0.0	$3/2^+$			
7070.82		3156.35	9 *2*	3914.24	$5/2^+$			
		7069.65	91 *2*	0.0	$3/2^+$			
7081.9		6640.8	30[#] *10*	439.991	$5/2^+$			
		7080.6	70[#] *10*	0.0	$3/2^+$			
7133.5		4151.0	13 *2*	2982.06	$3/2^+$			
		5056.9	13 *3*	2076.01	$7/2^+$			
		6692.5	30 *2*	439.991	$5/2^+$			
		7132.3	44 *2*	0.0	$3/2^+$			
7277.1	7/2,5/2	x	37					I_γ: Missing gamma deexcitation intensity of Iγ=37 from this level.
		3428.8	25 *3*	3848.07	$5/2^-$	D+Q	−0.2 *1*	Mult.: A_2=−0.58 *9* for J(7277)=7/2 (1989Ba42).
		6836.0	38 *3*	439.991	$5/2^+$	D+Q	+0.07 *6*	Mult.: A_2=−0.16 *10* for J(7277)=7/2 (1989Ba42).
7412.4	$5/2^+$,$7/2^+$,$9/2^+$	3497.9	24 *6*	3914.24	$5/2^+$			
		5335.7	31 *5*	2076.01	$7/2^+$			A_2=−0.30 *30*, A_4=0.8 *2* (1989Ba42).
		6971.3	45 *5*	439.991	$5/2^+$			A_2=−0.01 *15* (1989Ba42).
7451.5	5/2	3603.1	7.4 *12*	3848.07	$5/2^-$			
		5060.2	3.0 *11*	2390.732	$1/2^+$			
		7010.4	89.6 *15*	439.991	$5/2^+$	D+Q	−0.8 *2*	Mult.: A_2=−0.18 *4* (1989Ba42).
7487.84	1/2,(3/2)	3809.90	45 *7*	3677.60	$3/2^-$			A_2=0.00 *5* (1989Ba42).
		4847.43	20 *5*	2639.86	$1/2^-$	D		Mult.: A_2=0.18 *11* (1989Ba42).
		5096.50	35 *6*	2390.732	$1/2^+$	D		Mult.: A_2=0.05 *8* (1989Ba42).
7566.2	$5/2,7/2^+$	7125.0	30 *15*	439.991	$5/2^+$			
		7564.9	70 *15*	0.0	$3/2^+$			
7724.45		4741.87	25 *5*	2982.06	$3/2^+$			
		7723.06	75 *5*	0.0	$3/2^+$			
7750.5	$5/2,7/2^+$	4767.9	50 *2*	2982.06	$3/2^+$			
		7309.3	50 *2*	439.991	$5/2^+$			
7834.13	7/2,($5/2^+$)	3919.53	20 *6*	3914.24	$5/2^+$			
		5130.02	22 *7*	2703.50	$9/2^+$			
		7392.86	58 *9*	439.991	$5/2^+$	D(+Q)	−0.07 *7*	Mult.: A_2=−0.40 *11* for J(7834)=7/2 (1989Ba42).
7872.83	3/2,($5/2^+$)	x	32					I_γ: Missing gamma deexcitation intensity Iγ=32 from this level.
		4890.21	20 *5*	2982.06	$3/2^+$			
		5481.40	13 *3*	2390.732	$1/2^+$			
		7431.55	35 *5*	439.991	$5/2^+$	D+Q	−0.8 *6*	Mult.: A_2=0.33 *17* for J(7873)=3/2 (1989Ba42).
7876.2	5/2	x	27					I_γ: Missing gamma deexcitation intensity Iγ=27 from this level.

$^{23}_{11}Na_{12}$-10

γ(^{23}Na) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
7876.2	5/2	4027.8	18 *3*	3848.07	5/2$^-$			
		4198.2	20 *4*	3677.60	3/2$^-$			
		7874.8	35 *2*	0.0	3/2$^+$			
7891.2	5/2$^+$	5814.4	10 *5*	2076.01	7/2$^+$			
		7449.9	27 *2*	439.991	5/2$^+$	D(+Q)	0.0 *2*	Mult.: A_2=0.29 *11* (1989Ba42). δ: or +1.8 *6* (1989Ba42).
		7889.7	63 *2*	0.0	3/2$^+$	D+Q	−0.06 *4*	Mult.: A_2=−0.34 *6* (1989Ba42). δ: or −3.1 *5* (1989Ba42).
7970		x	29					I_γ: Missing gamma deexcitation intensity Iγ=29 from this level.
		5893	33 *6*	2076.01	7/2$^+$			
		7529	38 *7*	439.991	5/2$^+$			
8060		5356	50 *20*	2703.50	9/2$^+$			
		7619	50 *20*	439.991	5/2$^+$			
8302.0		7860.6	100 *25*	439.991	5/2$^+$			
8417.43	3/2	x	33					Missing gamma deexcitation intensity Iγ=33 from this level.
		5434.68	15 *5*	2982.06	3/2$^+$			
		5776.79	<10[#]	2639.86	1/2$^-$			
		6025.85	37 *5*	2390.732	1/2$^+$			
		6340.48	<10[#]	2076.01	7/2$^+$			
		8415.78	15 *5*	0.0	3/2$^+$			
8475.7		8034.2	100	439.991	5/2$^+$			
8631.0	3/2,5/2$^+$,7/2$^+$	8629.3	100	0.0	3/2$^+$			
8943.5	3/2$^+$	5028.7	77[&] *4*	3914.24	5/2$^+$			I_γ: From 2016De34. Other: 80 *6* in 2017Ke01.
		6551.8	23[&] *4*	2390.732	1/2$^+$			I_γ: From 2016De34. Other: 20 *4* in 2017Ke01.
8975.3	5/2$^+$	2357.1	3.4[&f] *7*	6618.1	7/2$^+$,(5/2)$^+$			I_γ: From 3.3 *7*: unweighted ave. of 4.7 *9* (2017Ke01), 2.7 *9* [2018Fe04 − 2.5 *8*], 2.4 *2* [2016De34 − 2.7 *2*]; × 1.03 for ΣIγ=100 from the level.
		4200.3	1.7 *2*	4774.61	7/2$^+$			I_γ: Wt. ave. of 1.9 *4* (2018Fe04) and 1.8 *2* (2016De34). Others: ≤3 (2017Ke01).
		5060.5	1.9[&f] *6*	3914.24	5/2$^+$			I_γ: Unweighted ave. of 3.1 *6* (2017Ke01), 1.7 *5* (2018Fe04 − 1.6 *5*), 1.0 *3* (2016De34 − 1.1 *3*).
		5297.0	2.6[&f] *4*	3677.60	3/2$^-$			I_γ: From 2.5 *4*: Wt. ave. of 2.6 *5* [2018Fe04 − 2.4 *5*] and 2.2 *8* (2017Ke01); × 1.03 for ΣIγ=100 from the level.
		5992.4	3.7[&f] *4*	2982.06	3/2$^+$			I_γ: From 3.6 *4*: weighted ave. of 5.0 *8* (2017Ke01), 3.6 *8* [2018Fe04 − 3.3 *7*], 3.3 *4* [2016De34 − 3.7 *5*]; × 1.03 for ΣIγ=100 from the level.
		6898.2	42.6[&f] *11*	2076.01	7/2$^+$			I_γ: From 41.5 *11*: weighted ave. of 39.8 *13* (2017Ke01), and 42.2 *8* [2016De34 − 47.9 *9*]; × 1.03 for ΣIγ=100 from the level. Other: 53 *6* (2018Fe04).

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
8975.3	5/2$^+$	8533.6	38.7[&f] *7*	439.991	5/2$^+$	I_γ: From 37.7 *7*: Weighted ave. of 37.7 *15* (2017Ke01), 37.7 *65* [2018Fe04 − 35 *6*], 37.7 *8* [2016De34 − 42.8 *9*].
		8973.4	5.3[&] *14*	0.0	3/2$^+$	I_γ: From 2017Ke01. Other: ≤1 (2018Fe04).
9042.4	(7/2,9/2)$^+$	2222	2.2[b] *2*	6819.6	5/2	
		2688	1.5[b] *2*	6354		
		3000	2.6[b] *2*	6042.19	7/2$^-$	
		3115	3.6[b] *2*	5926.8	7/2$^+$	
		5128	1.8[b] *4*	3914.24	5/2$^+$	
		5194	13.3[b] *5*	3848.07	5/2$^-$	
		6337	10.9[b] *5*	2703.50	9/2$^+$	
		6965	18.7[b] *6*	2076.01	7/2$^+$	
		8601	45.4[b] *9*	439.991	5/2$^+$	
9211.0	3/2$^-$	1338	0.44[&] *9*	7872.83	3/2,(5/2$^+$)	
		1723	1.07[&] *10*	7487.84	1/2,(3/2)	I_γ: Other: 2.8 *6* (2015De33).
		2129	2.80[&] *20*	7081.9		
		2290	1.24[&] *13*	6920.61	3/2$^-$	
		2343	1.84[&] *17*	6867.7	5/2$^+$,(3/2$^+$)	
		2903	2.27[&] *17*	6307.96		
		3016	2.74[&] *19*	6194.6	5/2$^-$	I_γ: Other: 3.4 *3* (2015De33).
		3247	16.9[&] *9*	5964.4	3/2$^-$	I_γ: Other: 17.1 *8* (2015De33).
		3469	1.90[&] *16*	5741.8	5/2$^+$	
		4781	3.08[&] *20*	4429.63	1/2$^+$	I_γ: Other: 4.7 *4* (2015De33).
		5297	22.2[&] *12*	3914.24	5/2$^+$	I_γ: Other: 30.0 *17* (2015De33).
		5363	2.44[&] *18*	3848.07	5/2$^-$	I_γ: Other: 2.0 *3* (2015De33).
		5533	1.21[&] *16*	3677.60	3/2$^-$	I_γ: Other: 3.1 *4* (2015De33).
		6229	27.8[&] *15*	2982.06	3/2$^+$	E_γ: A comparable γ ray placed from 9212.9-keV in Adopted Levels − see footnote for 9212.9-keV level. I_γ: Other: 22.4 *10* (2015De33).
		6571	3.23[&] *22*	2639.86	1/2$^-$	I_γ: Other: 6.4 *5* (2015De33).
		6820	1.44[&] *13*	2390.732	1/2$^+$	I_γ: Other: 2.0 *3* (2015De33).
		7135	1.27[&] *12*	2076.01	7/2$^+$	
		8771	2.89[&] *19*	439.991	5/2$^+$	I_γ: Other: 4.9 *5* (2015De33).
		9211	3.08[&] *23*	0.0	3/2$^+$	I_γ: Other: 1.2 *6* (2015De33).
9252.1	1/2$^+$	2170	2.06[a] *9*	7081.9		

$^{23}_{11}Na_{12}$-12

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
9252.1	1/2$^+$	2331	2.43[a] *9*	6920.61	3/2$^-$			I_γ: Other: 2.2 *1* (2015De33).
		3486	2.78[a] *9*	5766.03	3/2$^+$			I_γ: Other: 2.0 *1* (2015De33).
		4821	1.69[a] *9*	4429.63	1/2$^+$			I_γ: Other: 1.9 *1* (2015De33).
		5337	0.37[a] *9*	3914.24	5/2$^+$			I_γ: Other: <0.1 (2015De33).
		5573	4.85[a] *16*	3677.60	3/2$^-$			I_γ: Other: 4.5 *3* (2015De33).
		6269	31.7[a] *5*	2982.06	3/2$^+$			I_γ: Other: 32.7 *6* (2015De33).
		6611	8.27[a] *18*	2639.86	1/2$^-$			I_γ: Other: 9.4 *3* (2015De33).
		6860	4.05[a] *12*	2390.732	1/2$^+$			I_γ: Other: 3.6 *2* (2015De33).
		9250	41.8[a] *7*	0.0	3/2$^+$			A_2=0.04 *3*; A_4=−0.07 *6* (1973Me11) I_γ: Other: 43.6 *9* (2015De33).
9396.4	7/2$^-$	978.9	0.1	8417.43	3/2			
		1520.1	11	7876.2	5/2	D+Q	+0.08 *7*	Mult.: A_2=−0.20 *14* (1989Ba42).
		1645.8	1.3	7750.5	5/2,7/2$^+$			
		1830.1	1.5	7566.2	5/2,7/2$^+$	D+Q	+0.13 *7*	Mult.: A_2=0.07 *12* (1989Ba42).
		1944.8	1.0	7451.5	5/2			
		1983.9	5	7412.4	5/2$^+$,7/2$^+$,9/2$^+$	D+Q		Mult.: A_2=0.36 *6*, A_4=0.17 *6* (1989Ba42).
		2119.2	10	7277.1	7/2,5/2	D(+Q)	−0.04 *6*	Mult.: A_2=0.47 *10*, for J(7277)=7/2 (1989Ba42).
		2206	2	7190				
		2576.6	12	6819.6	5/2	D+Q	+0.06 *2*	Mult.: A_2=−0.22 *3* (1989Ba42).
		2818.4	4.4	6577.79	9/2$^+$,(5/2$^+$)			
		3041.7	2	6354		D+Q	+0.24 *7*	Mult.: A_2=−0.51 *9* (1989Ba42).
		3201.6	7.4	6194.6	5/2$^-$	D+Q	−0.11 *2*	Mult.: A_2=−0.53 *4* (1989Ba42).
		3353.9	9.7	6042.19	7/2$^-$	D(+Q)	+0.03 *6*	Mult.: A_2=0.46 *4* (1989Ba42).
		3654.3	10	5741.8	5/2$^+$	D(+Q)	+0.02 *2*	Mult.: A_2=−0.29 *3* (1989Ba42).
		4621.3	0.7	4774.61	7/2$^+$			
		5481.5	2.8	3914.24	5/2$^+$			
		5547.6	12	3848.07	5/2$^-$	D(+Q)	+0.02 *2*	Mult.: A_2=−0.31 *3* (1989Ba42).
		6691.9	4.7	2703.50	9/2$^+$			
		8954.5	3.0	439.991	5/2$^+$	D+Q	+2.6 *7*	Mult.: A_2=0.67 *10*, A_4=0.43 *10* (1989Ba42).
9404.8	1/2	1680.3	0.44[c] *3*	7724.45				
		3638.5	0.41[c] *3*	5766.03	3/2$^+$			
		4974.6	3.4[c] *1*	4429.63	1/2$^+$			
		5726.4	7.6[c] *2*	3677.60	3/2$^-$			
		6421.8	7.8[c] *4*	2982.06	3/2$^+$			
		6763.9	2.9[c] *1*	2639.86	1/2$^-$			
		8962.9	1.5[c] *1*	439.991	5/2$^+$			
		9402.7	76.0[c] *7*	0.0	3/2$^+$			
9426.1	3/2	1938.2		7487.84	1/2,(3/2)	D+Q	+0.098 *9*	A_2=−0.32 *2* (1989Ba42)
		2344.1		7081.9		D(+Q)	+0.11 *15*	A_2=0.41 *2* (1989Ba42)
		2606.3		6819.6	5/2	D+Q	+0.18 *4*	A_2=−0.20 *10* (1989Ba42) δ: or <−8.

$^{23}_{11}Na_{12}$-13

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
9426.1	3/2	2690.4	1.6	6735.5	3/2	D(+Q)	+0.04 *5*	A_2=0.48 *8* (1989Ba42)
		3117.9		6307.96		D(+Q)	−0.01 *3*	A_2=−0.50 *5* (1989Ba42) δ: or −1.7 *2*.
		3461.4		5964.4	3/2$^-$	D(+Q)	+0.01 *5*	A_2=0.47 *7*; A_4=−0.16 *7* (1989Ba42)
		3659.8		5766.03	3/2$^+$	D+Q	−0.18 *6*	A_2=0.12 *9* (1989Ba42)
		4995.9		4429.63	1/2$^+$	D(+Q)	+0.005 *10*	A_2=−0.48 *2* (1989Ba42)
		5511.2		3914.24	5/2$^+$	D+Q	−0.07 *2*	A_2=−0.02 *3* (1989Ba42)
		5577.3		3848.07	5/2$^-$	D+Q	−0.28 *2*	A_2=0.18 *2* (1989Ba42)
		6785.2		2639.86	1/2$^-$	D+Q	+0.25 *4*	A_2=−0.03 *7* (1989Ba42)
		7034.2		2390.732	1/2$^+$	D+Q	+0.022 *4*	A_2=−0.453 *8* (1989Ba42)
		8984.2		439.991	5/2$^+$	D+Q	+0.40 *5*	A_2=−0.53 *4* (1989Ba42) δ: or +6 *2*.
		9424.0		0.0	3/2$^+$	D+Q	+0.35 *3*	A_2=0.83 *3* (1989Ba42) δ: or +1.5 *2*.
9487.7	3/2	3179.5	1.6[@]	6307.96				
		3292.8	0.5[@]	6194.6	5/2$^-$			
		3523.0	1.1[@]	5964.4	3/2$^-$			
		3721.3	2.0[@]	5766.03	3/2$^+$			
		4108.7	1.2[@]	5378.56	5/2$^+$			
		5057.5	2.1[@]	4429.63	1/2$^+$			
		5573.7	3.3[@]	3914.24	5/2$^+$			
		5809.3	0.9[@]	3677.60	3/2$^-$			
		6504.7	2.5[@]	2982.06	3/2$^+$			
		6846.7	18[@]	2639.86	1/2$^-$			
		7095.8	0.8[@]	2390.732	1/2$^+$			
		9045.8	36[@]	439.991	5/2$^+$	D+Q	−1.2 +*2*−*8*	A_2=0.34 *10*; A_4=−0.07 *17* (1973Me11)
		9485.6	30[@]	0.0	3/2$^+$	D+Q	+0.36 *10*	A_2=0.84 *7*; A_4=−0.23 *10* (1973Me11) δ: or +1.7 *5*.
9608.2	3/2$^+$	1735.3	0.3	7872.83	3/2,(5/2$^+$)			
		1883.7	0.5	7724.45				
		2120.3	0.6	7487.84	1/2,(3/2)			
		2223	0.1	7385				
		2537.2	0.7	7070.82				
		2660.6	1.2	6947.40	3/2			
		2788.4	0.4	6819.6	5/2			
		2872.5	0.2	6735.5	3/2			
		3300.0	0.2	6307.96				
		3643.5	0.1	5964.4	3/2$^-$			

$^{23}_{11}Na_{12}$-14

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
9608.2	3/2$^+$	3841.8	0.6	5766.03	3/2$^+$			
		3866.1	2.2	5741.8	5/2$^+$	D+Q[e]	−0.38[e] *14*	A_2=−0.108 *118*; A_4=−0.033 *119*; A_6=−0.080 *133* (2006Ka65)
		4229.2	0.9	5378.56	5/2$^+$			
		5177.9	0.5	4429.63	1/2$^+$			
		5693.2	18	3914.24	5/2$^+$	D+Q[e]	+0.13[e] *4*	A_2=−0.138 *32*; A_4=0.85 *37*; A_6=−0.050 *34* (2006Ka65)
		5759.4	1.8	3848.07	5/2$^-$			
		6625.1	1.8	2982.06	3/2$^+$			
		6967.2	1.8	2639.86	1/2$^-$			
		7216.3	0.8	2390.732	1/2$^+$	D+Q	+0.20 *2*	
		9166.2	43	439.991	5/2$^+$	D+Q[e]	+0.32[e] *4*	A_2=−0.242 *25*; A_4=0.095 *25*; A_6=−0.056 *26* (2006Ka65)
		9606.0	24	0.0	3/2$^+$	D+Q[e]	+0.40[e] *10*	A_2=0.430 *55*; A_4=0.59 *49*; A_6=−0.055 *51* (2006Ka65)
9652.2	3/2$^+$,5/2$^+$	2784.3	1.5[@]	6867.7	5/2$^+$,(3/2$^+$)			
		4877.0	19[@]	4774.61	7/2$^+$			
		5737.2	1.0[@]	3914.24	5/2$^+$			
		5803.3	0.7[@]	3848.07	5/2$^-$			
		5973.8	3.0[@]	3677.60	3/2$^-$			
		7260.2	0.8[@]	2390.732	1/2$^+$			
		7574.9	1.0[@]	2076.01	7/2$^+$			
		9210.2	46[@]	439.991	5/2$^+$			
		9650.0	27[@]	0.0	3/2$^+$			
9655.6		4880.4	5.0[@]	4774.61	7/2$^+$			
		5225.3	1.2[@]	4429.63	1/2$^+$			
		5740.6	0.6[@]	3914.24	5/2$^+$			
		5977.2	28[@]	3677.60	3/2$^-$			
		6672.5	0.8[@]	2982.06	3/2$^+$			
		7014.6	3.8[@]	2639.86	1/2$^-$			
		7263.6	0.6[@]	2390.732	1/2$^+$			
		9213.6	16[@]	439.991	5/2$^+$			
		9653.4	44[@]	0.0	3/2$^+$			
9674.1	3/2$^+$,5/2$^+$	1782.8	1.2[@]	7891.2	5/2$^+$			
		2806.2	9.2[@]	6867.7	5/2$^+$,(3/2$^+$)			
		3479.2	2.0[@]	6194.6	5/2$^-$			
		3907.7	3.2[@]	5766.03	3/2$^+$			
		5759.1	7.0[@]	3914.24	5/2$^+$			
		5825.2	1.3[@]	3848.07	5/2$^-$			

$^{23}_{11}Na_{12}$-15

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
9674.1	3/2$^+$,5/2$^+$	5995.7	3.2[@]	3677.60	3/2$^-$			
		6691.0	6.9[@]	2982.06	3/2$^+$			
		7282.1	1.0[@]	2390.732	1/2$^+$			
		7596.7	19[@]	2076.01	7/2$^+$			
		9232.1	33[@]	439.991	5/2$^+$	D+Q	−0.11 *7*	A_2=0.34 *9*; A_4=−0.06 *14* (1979Sm02) δ: or −2.1 *12* (1979Sm02).
		9671.9	13[@]	0.0	3/2$^+$	D+Q	−3.7 *5*	A_2=−42 *7*; A_4=0.80 *12* (1979Sm02) δ: From 1979Sm02.
9682.7	3/2$^+$	1380.7	0.5[@]	8302.0				
		2116.4	5.8[@]	7566.2	5/2,7/2$^+$			
		2231.1	4.5[@]	7451.5	5/2			
		2600.6	2.5[@]	7081.9				
		4907.5	3.5[@]	4774.61	7/2$^+$			
		5767.7	3.1[@]	3914.24	5/2$^+$			
		5833.8	25[@]	3848.07	5/2$^-$			
		6004.3	8.3[@]	3677.60	3/2$^-$			
		6699.6	15[@]	2982.06	3/2$^+$			
		7605.3	1.4[@]	2076.01	7/2$^+$			
		9240.7	2.4[@]	439.991	5/2$^+$	D(+Q)	−1.2 *+15−11*	A_2=0.13 *12*; A_4=0.59 *21* (1973Me11) δ: From 1973Me11.
		9680.5	28[@]	0.0	3/2$^+$	D+Q	−0.36 *10*	A_2=−0.28 *3*; A_4=0.11 *6* (1973Me11) δ: or −5.7 *+57−20* (1973Me11).
9700.9	3/2$^+$	1809.6	0.3[@]	7891.2	5/2$^+$			
		1950.3	0.3[@]	7750.5	5/2,7/2$^+$			
		1976.4	0.2[@]	7724.45				
		2965.2	0.4[@]	6735.5	3/2			
		3958.7	1.9[@]	5741.8	5/2$^+$			
		5270.6	0.3[@]	4429.63	1/2$^+$			
		5785.9	2.0[@]	3914.24	5/2$^+$	D+Q[e]	+0.16[e] *11*	A_2=−0.105 *104*; A_4=0.049 *109*; A_6=0.031 *105* (2006Ka65)
		6022.5	2.5[@]	3677.60	3/2$^-$	D+Q[e]	+0.35[e] *9*	A_2=0.423 *52*; A_4=−0.033 *40*; A_6=−0.015 *53* (2006Ka65)
		6717.8	3.9[@]	2982.06	3/2$^+$	D+Q	+20 *12*	A_2=0.008 *73*; A_4=−0.097 *6*; A_6=−0.068 *84* (2006Ka65)
		7059.9	8.0[@]	2639.86	1/2$^-$	D+Q[e]	−0.58[e] *7*	A_2=−0.702 *1*; A_4=−0.046 *72*; A_6=0.045 *70* (2006Ka65)
		7308.9	0.7[@]	2390.732	1/2$^+$			
		7622.5	1.5[@]	2076.01	7/2$^+$			

$^{23}_{11}Na_{12}$-16

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
9700.9	3/2$^+$	9258.9	30[@]	439.991	5/2$^+$	D+Q[e]	−0.18[e] *6*	A_2=−0.005 *34*; A_4=−0.009 *35*; A_6=−0.020 *30* (2006Ka65)
		9698.7	48[@]	0.0	3/2$^+$	D+Q[e]	+0.14[e] *4*	A_2=0.312 *37*; A_4=−0.070 *37*; A_6=0.020 *39* (2006Ka65)
9732.53	7/2	1256.8	1.4	8475.7				A_2=−0.28 *5*.
		1430.5	0.9	8302.0				
		1671	0.6	8060				
		1856.2	1.2	7876.2	5/2			
		1898.3	0.6	7834.13	7/2,(5/2$^+$)			
		1981.9	1.0	7750.5	5/2,7/2$^+$	D(+Q)	+0.02 *4*	Mult.: A_2=−0.28 *8*, for J(7750)=5/2 (1989Ba42).
		2320.0	0.2	7412.4	5/2$^+$,7/2$^+$,9/2$^+$			
		2455.3	0.6	7277.1	7/2,5/2			
		2912.7	1.2	6819.6	5/2	D+Q	−0.11 *4*	Mult.: A_2=−0.50 *6* (1989Ba42).
		3154.50	2.8	6577.79	9/2$^+$,(5/2$^+$)	D(+Q)	−0.01 *3*	Mult.: A_2=−0.14 *16*, for J(6578)=9/2$^+$.
		3537.6	1.5	6194.6	5/2$^-$	D+Q	−3.4 *7*	Mult.: A_2=−0.23 *9* (1989Ba42).
		3690.02	14	6042.19	7/2$^-$	D+Q	+0.05 *4*	Mult.: A_2=−0.43 *3*, A_4=0.07 *3* (1989Ba42).
		3990.4	3.5	5741.8	5/2$^+$	D(+Q)	0.00 *3*	Mult.: A_2=−0.34 *3* (1989Ba42).
		4353.53	3.9	5378.56	5/2$^+$	D(+Q)	+0.02 *3*	Mult.: A_2=−0.29 *4* (1989Ba42).
		5817.50	4.1	3914.24	5/2$^+$	D+Q	−0.12 *5*	Mult.,δ: From 2005Vo22.
		5883.65	19	3848.07	5/2$^-$	D+Q	−0.05 *2*	Mult.: A_2=−0.40 *2* (1989Ba42).
		7027.88	17	2703.50	9/2$^+$	D(+Q)	−0.02 *2*	Mult.: A_2=−0.12 *2* (1989Ba42).
		7655.15	6.7	2076.01	7/2$^+$	D+Q	+0.118 *5*	Mult.: A_2=0.47 *3*, A_4=0.10 *3* (1989Ba42).
		9290.52 *13*	20	439.991	5/2$^+$	D+Q	+0.033 *7*	Mult.: A_2=−0.257 *11* (1989Ba42).
								δ: Also same value in 2005Vo22.
9755.5	3/2$^+$	5325.3	0.6[@]	4429.63	1/2$^+$			
		5840.5	4.2[@]	3914.24	5/2$^+$			
		5906.6	8.1[@]	3848.07	5/2$^-$			
		6077.0	10[@]	3677.60	3/2$^-$			
		7114.5	59[@]	2639.86	1/2$^-$			
		7363.5	0.8[@]	2390.732	1/2$^+$			
		9313.5	7.9[@]	439.991	5/2$^+$			
		9753.3	9.4[@]	0.0	3/2$^+$			
9815.7	5/2$^+$	1513.6	0.1	8302.0				
		1846	1.5	7970				
		1924.4	0.3	7891.2	5/2$^+$			
		1942.8	0.5	7872.83	3/2,(5/2$^+$)			
		2403.2	0.7	7412.4	5/2$^+$,7/2$^+$,9/2$^+$			
		2682.0	0.9	7133.5				
		2744.7	3.0	7070.82				
		2868.1	3.6	6947.40	3/2			
		3080.0	0.7	6735.5	3/2			

$^{23}_{11}Na_{12}$-17

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
9815.7	5/2$^+$	3197.6	0.5	6618.1	7/2$^+$,(5/2)$^+$			
		3888.5	0.5	5926.8	7/2$^+$			
		4049.3	7.7	5766.03	3/2$^+$	D+Q	−0.039 *13*	Mult.: A_2=−0.48 *3* (1989Ba42).
		4073.5	1.6	5741.8	5/2$^+$			
		5040.5	1.4	4774.61	7/2$^+$			
		5385.4	2.4	4429.63	1/2$^+$			
		5900.6	4.8	3914.24	5/2$^+$			
		5966.8	0.2	3848.07	5/2$^-$			
		6832.6	32	2982.06	3/2$^+$			
		7111.0	6.7	2703.50	9/2$^+$			
		7423.7	0.6	2390.732	1/2$^+$			
		7738.3	16	2076.01	7/2$^+$			
		9373.7	7.3	439.991	5/2$^+$			
		9813.5	6.4	0.0	3/2$^+$			
9835.4	3/2$^+$	1944.1	1.5[@]	7891.2	5/2$^+$			
		2702.0	2.0[@]	7133.5				
		2764.4	0.3[@]	7070.82				
		3099.7	1.4[@]	6735.5	3/2			
		3640.5	4.4[@]	6194.6	5/2$^-$			
		4093.2	1.6[@]	5741.8	5/2$^+$			
		4456.4	2.2[@]	5378.56	5/2$^+$			
		5405.1	4.8[@]	4429.63	1/2$^+$			
		5920.3	12[@]	3914.24	5/2$^+$			
		5986.5	3.4[@]	3848.07	5/2$^-$			
		6156.9	0.2[@]	3677.60	3/2$^-$			
		6852.2	0.2[@]	2982.06	3/2$^+$			
		7443.4	12[@]	2390.732	1/2$^+$			
		9393.3	14[@]	439.991	5/2$^+$			
		9833.1	40[@]	0.0	3/2$^+$			
9850.1	1/2$^+$	5419.8	3.5[@]	4429.63	1/2$^+$			
		6171.6	11[@]	3677.60	3/2$^-$			
		6866.9	2.2[@]	2982.06	3/2$^+$			
		7209.0	32[@]	2639.86	1/2$^-$			
		7458.1	33[@]	2390.732	1/2$^+$			
		9408.9	0.3[@]	439.991	5/2$^+$			

$^{23}_{11}Na_{12}$-18

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
9850.1	1/2$^+$	9847.8	18[@]	0.0	3/2$^+$			
9890.9	3/2	4124.5	2.1[#]	5766.03	3/2$^+$			
		4511.9	2.1[#]	5378.56	5/2$^+$			
		5975.8	10[#]	3914.24	5/2$^+$			
		6042.0	5.7[#]	3848.07	5/2$^-$			
		6212.4	7.9[#]	3677.60	3/2$^-$			
		7249.8	22[#]	2639.86	1/2$^-$			
		7498.9	8.2[#]	2390.732	1/2$^+$			
		9448.8	18[#]	439.991	5/2$^+$			
		9888.6	24[#]	0.0	3/2$^+$			
9917.0	3/2$^+$,5/2,7/2	3049.1	5.0[#]	6867.7	5/2$^+$,(3/2$^+$)			
		5141.8	7.0[#]	4774.61	7/2$^+$			
		6001.9	40[#]	3914.24	5/2$^+$			
		6068.1	22[#]	3848.07	5/2$^-$			
		9474.9	22[#]	439.991	5/2$^+$			
		9914.7	4.0[#]	0.0	3/2$^+$			
10003.2	1/2$^-$	4038.4	2.6[#]	5964.4	3/2$^-$			
		4236.8	11[#]	5766.03	3/2$^+$			
		5572.8	3.0[#]	4429.63	1/2$^+$			
		6324.7	3.5[#]	3677.60	3/2$^-$			
		7020.0	1.9[#]	2982.06	3/2$^+$			
		7362.1	47[#]	2639.86	1/2$^-$			
		7611.1	12[#]	2390.732	1/2$^+$			
		10000.9	19[#]	0.0	3/2$^+$			
10017.4	5/2$^+$	1386.4	0.1	8631.0	3/2,5/2$^+$,7/2$^+$			
		1599.9	0.3	8417.43	3/2	D+Q	+0.37 *4*	Mult.: A_2=−0.50 *6*(1989Ba42).
		2141.1	0.3	7876.2	5/2	D+Q	−0.09 *7*	Mult.: A_2=0.35 *8* (1989Ba42).
		2565.7	0.6	7451.5	5/2	D+Q	−0.49 *3*	Mult.: A_2=−0.14 *3* (1989Ba42).
		2740.1	0.3	7277.1	7/2,5/2			
		2884.0	0.2	7133.5				
		3096.6	0.3	6920.61	3/2$^-$			
		3281.6	0.2	6735.5	3/2			
		3399.0	3.7	6618.1	7/2$^+$,(5/2)$^+$	D(+Q)	0.00 *1*	Mult.: A_2=−0.12 *2*, for J(6618)=7/2 (1989Ba42).
		3974.8	0.1	6042.19	7/2$^-$			
		4250.9	0.3	5766.03	3/2$^+$	D+Q	−0.15 *4*	Mult.: A_2=−0.65 *6* (1989Ba42).

$^{23}_{11}Na_{12}$-19

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
10017.4	5/2$^+$	4276.0	0.4	5741.8	5/2$^+$			
		4638.3	0.7	5378.56	5/2$^+$	D+Q	−0.05 *4*	Mult.: A_2=0.39 *5* (1989Ba42). δ: or +1.3 *2* (1989Ba42).
		5242.1	0.3	4774.61	7/2$^+$			
		6102.3	19	3914.24	5/2$^+$	D+Q	+0.05 *2*	Mult.: A_2=0.49 *2* (1989Ba42).
		6168.4	5	3848.07	5/2$^-$	D(+Q)	0.00 *2*	Mult.: A_2=0.44 *2* (1989Ba42).
		6338.9	12	3677.60	3/2$^-$	D+Q	−0.020 *6*	Mult.: A_2=−0.422 *11* (1989Ba42).
		7034.2	34	2982.06	3/2$^+$	D+Q	−0.032 *5*	Mult.: A_2=−0.445 *9* (1989Ba42).
		7312.7	0.1	2703.50	9/2$^+$			
		7625.3	0.4	2390.732	1/2$^+$			
		7939.9	5	2076.01	7/2$^+$	D+Q	−0.276 *14*	Mult.: A_2=0.217 *14* (1989Ba42). δ: Also same value in 2005Vo22.
		9575.3	15	439.991	5/2$^+$	D+Q	−0.207 *13*	Mult.: A_2=0.206 *16* (1989Ba42).
		10015.1	1.6	0.0	3/2$^+$	D+Q	−0.126 *11*	Mult.: A_2=−0.614 *13* (1989Ba42).
10049.1		6200.1	32[#]	3848.07	5/2$^-$			
		7971.6	24[#]	2076.01	7/2$^+$			
		9607.0	44[#]	439.991	5/2$^+$			
10070.9	5/2,7/2	7993.4	56[#]	2076.01	7/2$^+$			A_2=−0.14 *4*, A_4=−0.06 *7* (1989Ba42).
		9628.7	36[#]	439.991	5/2$^+$			A_2=0.65 *3*, A_4=−0.04 *6* (1989Ba42).
		10068.5	8.0[#]	0.0	3/2$^+$			
10075.9	3/2,7/2	3257.6	2.9[#]	6819.6	5/2			
		4033.3	5.1[#]	6042.19	7/2$^-$			
		4111.1	1.4[#]	5964.4	3/2$^-$			
		4333.7	2.3[#]	5741.8	5/2$^+$			
		5300.6	18[#]	4774.61	7/2$^+$			
		6226.9	16[#]	3848.07	5/2$^-$			
		6397.3	4.0[#]	3677.60	3/2$^-$			
		7092.7	15[#]	2982.06	3/2$^+$			
		7434.7	0.9[#]	2639.86	1/2$^-$			
		7998.4	22[#]	2076.01	7/2$^+$			
		9633.7	6.6[#]	439.991	5/2$^+$			
		10073.5	5.8[#]	0.0	3/2$^+$			
10085.3	1/2$^+$	3137.7	4.0[#]	6947.40	3/2			
		3164.5	6.7[#]	6920.61	3/2$^-$			
		3349.5	4.7[#]	6735.5	3/2			
		3777.0	26[#]	6307.96				

$^{23}_{11}Na_{12}$-20

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
10085.3	1/2$^+$	4318.8	22[#]	5766.03	3/2$^+$			
		5654.9	3.2[#]	4429.63	1/2$^+$			
		6406.7	6.3[#]	3677.60	3/2$^-$			
		7102.1	1.5[#]	2982.06	3/2$^+$			
		7693.2	4.7[#]	2390.732	1/2$^+$			
		9643.1	6.9[#]	439.991	5/2$^+$			
		10082.9	14[#]	0.0	3/2$^+$			
10114.8	1/2$^+$	4150.0	4.3[#]	5964.4	3/2$^-$			
		4348.3	7.5[#]	5766.03	3/2$^+$			
		7131.6	77[#]	2982.06	3/2$^+$			
		7722.7	1.6[#]	2390.732	1/2$^+$			
		10112.4	9.6[#]	0.0	3/2$^+$			
10125.9	5/2	4083.3	2.7[#]	6042.19	7/2$^-$			
		4161.1	1.9[#]	5964.4	3/2$^-$			
		4384.2	8.0[#]	5741.8	5/2$^+$			
		4746.8	2.6[#]	5378.56	5/2$^+$			
		6210.8	3.5[#]	3914.24	5/2$^+$			
		6276.9	4.8[#]	3848.07	5/2$^-$			
		6447.3	21[#]	3677.60	3/2$^-$			
		7142.6	2.5[#]	2982.06	3/2$^+$			
		8048.4	24[#]	2076.01	7/2$^+$			
		9683.7	17[#]	439.991	5/2$^+$			
		10123.5	12[#]	0.0	3/2$^+$			
10169.6	5/2$^+$	1693.8	0.6	8475.7				
		2109	1.0	8060				
		2296.6	2.5	7872.83	3/2,(5/2$^+$)	D+Q	+0.09 *3*	Mult.: A_2=−0.19 *3*, for J(7873)=3/2 (1989Ba42).
		2335.3	1.7	7834.13	7/2,(5/2$^+$)	D(+Q)	0.00 *3*	Mult.: A_2=−0.14 *5*, for J(7834)=7/2 (1989Ba42).
		2892.3	0.8	7277.1	7/2,5/2			
		3301.6	6.8	6867.7	5/2$^+$,(3/2$^+$)			
		3433.8	0.5	6735.5	3/2			
		3974.6	0.9	6194.6	5/2$^-$	D(+Q)	+0.05 *17*	Mult.: A_2=0.47 *12* (1989Ba42).
		4127.0	1.1	6042.19	7/2$^-$	D(+Q)	+0.06 *7*	Mult.: A_2=−0.21 *9* (1989Ba42).
		4242.4 *4*	1.9	5926.8	7/2$^+$	D+Q	+0.18 *4*	Mult.: A_2=−0.37 *5* (1989Ba42). δ: or >−4.
		4427.3	2.6	5741.8	5/2$^+$	D+Q	−0.41 *8*	Mult.: A_2=−0.04 *9* (1989Ba42). δ: or +2.7 *7*.

$^{23}_{11}Na_{12}$-21

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
10169.6	5/2$^+$	4790.5	6.8	5378.56	5/2$^+$			
		5394.3	11	4774.61	7/2$^+$	D+Q	+0.30 *2*	Mult.: A_2=−0.52 *2* (1989Ba42). δ: Also same value in 2005Vo22.
		6254.4	0.6	3914.24	5/2$^+$			
		6320.6	0.8	3848.07	5/2$^-$			
		7186.3	45	2982.06	3/2$^+$	D+Q	+0.14 *2*	Mult.: A_2=−0.10 *3* (1989Ba42).
		7464.8	2	2703.50	9/2$^+$	Q(+O)	+0.03 *5*	Mult.: A_2=0.15 *6* (1989Ba42).
		8092.1	1.5	2076.01	7/2$^+$	D+Q	+0.11 *3*	Mult.,δ: From 2005Vo22.
		9727.4	8.1	439.991	5/2$^+$	D+Q	+1.33 *9*	Mult.: A_2=0.51 *3*, A_4=−0.16 *4* (1989Ba42).
		10167.2	4.0	0.0	3/2$^+$	D+Q	−3.4 *19*	Mult.: A_2=−0.37 *3*, A_4=0.49 *3* (1989Ba42).
10231.7	5/2$^+$	1756.9	0.3	8475.7				
		1814.2	1.3	8417.43	3/2			
		1929.6	0.3	8302.0				
		2665.3	0.6	7566.2	5/2,7/2$^+$			
		2819.1	0.5	7412.4	5/2$^+$,7/2$^+$,9/2$^+$			
		3098.0	2.1	7133.5				
		3284.0	0.9	6947.40	3/2			
		3363.7	1.2	6867.7	5/2$^+$,(3/2$^+$)	D+Q	+0.12 *10*	Mult.: A_2=0.54 *7*, for J(6868)=5/2 (1989Ba42).
		3613.3	3.7	6618.1	7/2$^+$,(5/2)$^+$	D+Q	−0.03 *2*	Mult.: A_2=−0.09 *3*, for J(6618)=3/2 (1989Ba42).
		4189.1	3.7	6042.19	7/2$^-$	D(+Q)	−0.02 *3*	Mult.: A_2=−0.11 *4* (1989Ba42).
		4304.5	18	5926.8	7/2$^+$	D+Q	+0.04 *2*	Mult.: A_2=−0.19 *2* (1989Ba42). δ: Also same value in 2005Vo22.
		4465.2	0.6	5766.03	3/2$^+$			
		4489.4	0.3	5741.8	5/2$^+$			
		6316.5	11	3914.24	5/2$^+$			
		6382.7	0.3	3848.07	5/2$^-$			
		6553.1	4.5	3677.60	3/2$^-$	D(+Q)	−0.02 *2*	Mult.: A_2=−0.41 *2* (1989Ba42).
		7839.5	3.6	2390.732	1/2$^+$	Q		Mult.: A_2=0.55 *4*, A_4=−0.42 *4*.
		9789.5	45	439.991	5/2$^+$	D+Q	+0.30 *3*	Mult.: A_2=0.67 *2* (1989Ba42).
		10229.3	2.1	0.0	3/2$^+$	D+Q	+0.03 *2*	Mult.: A_2=−0.32 *3* (1989Ba42).
10243.7	1/2$^+$	2519.1	7	7724.45				
		4477.2	6	5766.03	3/2$^+$			
		5813.3	2	4429.63	1/2$^+$			
		6565.1	50	3677.60	3/2$^-$			
		7260.4	5	2982.06	3/2$^+$			
		7603.0	6	2639.86	1/2$^-$			
		7851.5	19	2390.732	1/2$^+$			
		9801.5	5	439.991	5/2$^+$			
10281.5	3/2$^+$	3147.8	1.2[#]	7133.5				
		4316.7	2.4[#]	5964.4	3/2$^-$			
		4515.0	6.3[#]	5766.03	3/2$^+$			

$^{23}_{11}Na_{12}$-22

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.	δ [d]	Comments
10281.5	3/2$^+$	4902.4	1.2#	5378.56	5/2$^+$			
		5506.2	1.3#	4774.61	7/2$^+$			
		6366.3	39#	3914.24	5/2$^+$			
		7298.2	4.4#	2982.06	3/2$^+$			
		7640.7	5.4#	2639.86	1/2$^-$			
		7889.3	14#	2390.732	1/2$^+$			
		9839.2	15#	439.991	5/2$^+$			
		10279.0	9.8#	0.0	3/2$^+$			
10318.0	3/2$^-$	5887.6	14#	4429.63	1/2$^+$	D(+Q)[e]	−0.6[e] *10*	A_2=−0.541 *151*; A_4=0.102 *140*; A_6=−0.079 *125* (2006Ka65)
		6469.0	4.5#	3848.07	5/2$^-$	D(+Q)[e]	+7[e] *8*	A_2=−0.267 *157*; A_4=0.001 *152*; A_6=−0.052 *159* (2006Ka65)
		6639.4	2.8#	3677.60	3/2$^-$			
		7334.7	8.5#	2982.06	3/2$^+$	D+Q[e]	+1.3[e] *7*	A_2=0.425 *139*; A_4=0.004 *122*; A_6=−0.072 *136* (2006Ka65)
		7677.2	20#	2639.86	1/2$^-$	D+Q[e]	−0.58[e] *27*	A_2=−0.730 *175*; A_4=0.159 *152*; A_6=−0.125 *145* (2006Ka65)
		7925.8	1.2#	2390.732	1/2$^+$			
		9875.7	34#	439.991	5/2$^+$	D+Q[e]	+0.12[e] *6*	A_2=−0.116 *46*; A_4=0.013 *40*; A_6=−0.019 *53* (2006Ka65)
		10315.5	15#	0.0	3/2$^+$	D(+Q)[e]	+0.14[e] *37*	A_2=0.441 *5*; A_4=−0.061 *74*; A_6=0.025 *1* (2006Ka65)
10338.7	(1/2$^-$)	3417.8	3.0#	6920.61	3/2$^-$			
		3518.8	0.9#	6819.6	5/2			
		4030.4	3.6#	6307.96				
		4373.9	1.4#	5964.4	3/2$^-$			
		6660.1	4.9#	3677.60	3/2$^-$			
		7355.4	29#	2982.06	3/2$^+$			
		7697.9	5.9#	2639.86	1/2$^-$			
		7946.5	15#	2390.732	1/2$^+$			
		9896.4	3.3#	439.991	5/2$^+$			
		10336.2	33#	0.0	3/2$^+$			
10346.1	5/2$^+$	4303.5	1.2#	6042.19	7/2$^-$			
		4579.6	3.6#	5766.03	3/2$^+$			
		4603.8	2.4#	5741.8	5/2$^+$			
		4967.0	1.6#	5378.56	5/2$^+$			
		5570.8	1.9#	4774.61	7/2$^+$			
		6430.9	7.7#	3914.24	5/2$^+$	D+Q	−0.10 *7*	Mult.,δ: From 2009Us01.
		6497.0	0.7#	3848.07	5/2$^-$			

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
10346.1	5/2$^+$	6667.5	1.5[#]	3677.60	3/2$^-$			
		7362.8	3.8[#]	2982.06	3/2$^+$	D(+Q)	−0.09 *10*	Mult.,δ: From 2009Us01.
		7953.9	3.6[#]	2390.732	1/2$^+$			
		8268.5	15[#]	2076.01	7/2$^+$	D+Q	−0.06 *2*	Mult.,δ: From 2009Us01 and 2005Vo22.
		9903.8	28[#]	439.991	5/2$^+$	D+Q	+0.21 *8*	Mult.: A_2=0.64 *5*, A_4=0.10 *7* (1979Sm02). δ: From (1979Sm02). Other: +0.15 *9* (2009Us01).
		10343.6	29[#]	0.0	3/2$^+$	D+Q	−0.29 *4*	Mult.: A_2=−0.85 *10*, A_4=0.02 *14* (1979Sm02). δ: Wt. av. of −0.27 *5* (1979Sm02) and −0.30 *4* (2009Us01). Other possible values: −1.1 *2* (1979Sm02), −1.5 *2* (2009Us01).
10353.8	3/2$^+$	2462.5	1.7[#]	7891.2	5/2$^+$			
		3618.0	0.5[#]	6735.5	3/2			
		4587.3	3.2[#]	5766.03	3/2$^+$			
		4611.5	2.0[#]	5741.8	5/2$^+$			
		4974.7	3.5[#]	5378.56	5/2$^+$			
		5923.4	1.4[#]	4429.63	1/2$^+$			
		6438.6	0.9[#]	3914.24	5/2$^+$			
		6504.7	30[#]	3848.07	5/2$^-$			
		6675.2	8.0[#]	3677.60	3/2$^-$			
		7370.5	4.1[#]	2982.06	3/2$^+$			
		7713.0	34[#]	2639.86	1/2$^-$			
		7961.6	2.8[#]	2390.732	1/2$^+$			
		8276.2	2.6[#]	2076.01	7/2$^+$			
		9911.5	3.8[#]	439.991	5/2$^+$			
		10351.3	1.5[#]	0.0	3/2$^+$			
10440.6	5/2$^+$	2023.1	3.3[#]	8417.43	3/2			
		3028.0	2.1[#]	7412.4	5/2$^+$,7/2$^+$,9/2$^+$			
		3822.2	3.4[#]	6618.1	7/2$^+$,(5/2)$^+$			
		5061.4	1.2[#]	5378.56	5/2$^+$			
		6525.4	9.0[#]	3914.24	5/2$^+$	D+Q	+0.50 *10*	Mult.,δ: From 2009Us01.
		6761.9	0.5[#]	3677.60	3/2$^-$			
		7457.2	36[#]	2982.06	3/2$^+$	D+Q	−0.35 *8*	A_2=−0.320 *47*; A_4=0.019 *44*; A_6=−0.013 *40* (2006Ka65) Mult.,δ: From 2009Us01. Other: δ=−0.35 *7* (2006Ka65).
		8363.0	9.5[#]	2076.01	7/2$^+$	D+Q	+0.09 *3*	A_2=−0.128 *100*; A_4=−0.069 *113*; A_6=0.056 *117* (2006Ka65) Mult.,δ: From 2009Us01 and 2005Vo22. Other: δ=+0.12 *21* (2006Ka65).

$^{23}_{11}Na_{12}$-24

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
10440.6	5/2$^+$	9998.3	20 [#]	439.991	5/2$^+$	D+Q	−0.22 *10*	A_2=0.114 *109*; A_4=−0.030 *110*; A_6=−0.043 *124* (2006Ka65) Mult.,δ: From 2009Us01. Other: δ=−0.23 *15* (2006Ka65).
		10438.1	15 [#]	0.0	3/2$^+$	D+Q	+0.24 *8*	A_2=0.250 *132*; A_4=−0.095 *146*; A_6=−0.092 *130* (2006Ka65) Mult.,δ: From 2009Us01. Other: δ=+0.38 *12* (2006Ka65).
10448.7		1972.9	5.7 [#]	8475.7				
		2557.3	2.6 [#]	7891.2	5/2$^+$			
		4406.1	5.3 [#]	6042.19	7/2$^-$			
		6533.5	16 [#]	3914.24	5/2$^+$			
		6599.6	33 [#]	3848.07	5/2$^-$			
		7743.8	16 [#]	2703.50	9/2$^+$			
		8371.1	18 [#]	2076.01	7/2$^+$			
		10006.4	2.6 [#]	439.991	5/2$^+$			
		10446.2	0.8 [#]	0.0	3/2$^+$			
10478.8	3/2$^+$	2754.2	2.3 [#]	7724.45				
		3660.4	1.3 [#]	6819.6	5/2			
		4712.3	3.1 [#]	5766.03	3/2$^+$			
		4737	14 [#]	5741.8	5/2$^+$			
		5099.6	31 [#]	5378.56	5/2$^+$			
		6563.6	11 [#]	3914.24	5/2$^+$			
		6629.7	2.4 [#]	3848.07	5/2$^-$			
		7838.0	1.4 [#]	2639.86	1/2$^-$			
		8086.5	3.1 [#]	2390.732	1/2$^+$			
		10036.5	3.4 [#]	439.991	5/2$^+$			
		10476.2	27 [#]	0.0	3/2$^+$			
10501.9	3/2$^-$	4760	0.7 [#]	5741.8	5/2$^+$			
		6071.4	1.0 [#]	4429.63	1/2$^+$			
		6652.8	7.0 [#]	3848.07	5/2$^-$			
		6823.2	4.8 [#]	3677.60	3/2$^-$			
		7518.5	2.0 [#]	2982.06	3/2$^+$			
		7861.1	1.7 [#]	2639.86	1/2$^-$			
		8109.6	4.8 [#]	2390.732	1/2$^+$			
		10059.5	25 [#]	439.991	5/2$^+$			
		10499.3	53 [#]	0.0	3/2$^+$			

$^{23}_{11}Na_{12}$-25

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
10507.8	1/2$^+$	3425.6	5.9 [#]	7081.9				
		3586.9	4.2 [#]	6920.61	3/2$^-$			
		4199.4	1.8 [#]	6307.96				
		4542.9	2.8 [#]	5964.4	3/2$^-$			
		4741.2	3.3 [#]	5766.03	3/2$^+$			
		6077.3	9.0 [#]	4429.63	1/2$^+$			
		6829.1	8.8 [#]	3677.60	3/2$^-$			
		7524.4	11 [#]	2982.06	3/2$^+$			
		7867.0	29 [#]	2639.86	1/2$^-$			
		8115.5	10 [#]	2390.732	1/2$^+$			
		10065.4	3.2 [#]	439.991	5/2$^+$			
		10505.2	11 [#]	0.0	3/2$^+$			
10519.1	5/2$^+$	1888.0	0.7	8631.0	3/2,5/2$^+$,7/2$^+$			A_2=−0.40 *6* (1989Ba42).
		2101.6	1.7	8417.43	3/2	D(+Q)	+0.02 *2*	Mult.: A_2=−0.36 *3* (1989Ba42).
		2159.0	0.2	8360.0				
		2627.7	3.8	7891.2	5/2$^+$	D(+Q)	−0.01 *4*	Mult.: A_2=0.45 *4* (1989Ba42).
		2684.8	0.7	7834.13	7/2,(5/2$^+$)	D(+Q)	+0.01 *5*	Mult.: A_2=−0.15 *8*, for J(7834)=7/2 (1989Ba42).
		2952.7	0.3	7566.2	5/2,7/2$^+$			
		3067.4	0.8	7451.5	5/2	D+Q	−0.52 *7*	Mult.: A_2=−0.17 *7* (1989Ba42).
		3106.5	0.3	7412.4	5/2$^+$,7/2$^+$,9/2$^+$			
		3385.3	2.3	7133.5				
		3571.4	0.7	6947.40	3/2	D+Q	−0.06 *3*	Mult.: A_2=−0.49 *5* (1989Ba42).
		3598.2	0.7	6920.61	3/2$^-$			
		3651.1	1.9	6867.7	5/2$^+$,(3/2$^+$)	D(+Q)	+0.04 *5*	Mult.: A_2=0.48 *5*, for J(6868)=5/2 (1989Ba42).
		3699.2	0.5	6819.6	5/2	D(+Q)	+0.06 *13*	Mult.: A_2=0.50 *11* (1989Ba42).
		3783.3	0.5	6735.5	3/2			
		3900.6	1.8	6618.1	7/2$^+$,(5/2)$^+$	D+Q	+0.06 *4*	Mult.: A_2=−0.23 *5*, for J(6618)=7/2 (1989Ba42).
		4210.7	0.2	6307.96				
		4554.2	0.4	5964.4	3/2$^-$			
		4752.5	2.6	5766.03	3/2$^+$	D+Q	+0.17 *2*	Mult.: A_2=−0.04 *5* (1989Ba42).
		4776.8	1.5	5741.8	5/2$^+$	D(+Q)	+0.04 *6*	Mult.: A_2=0.49 *6* (1989Ba42).
		5139.9	0.6	5378.56	5/2$^+$			
		6088.6	0.4	4429.63	1/2$^+$			
		6840.4	2.1	3677.60	3/2$^-$	D(+Q)	0.00 *4*	Mult.: A_2=−0.40 *8* (1989Ba42).
		7535.7	3.5	2982.06	3/2$^+$	D(+Q)	+0.01 *3*	Mult.: A_2=−0.38 *5* (1989Ba42). δ: Other: +0.1 *2* (2009Us01).
		7814.2	0.8	2703.50	9/2$^+$			
		8126.8	2.4	2390.732	1/2$^+$	Q		Mult.: A_2=0.23 *8*, A_4=−0.43 *9* (1989Ba42).

$^{23}_{11}Na_{12}$-26

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

$\gamma(^{23}Na)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.	δ [d]	Comments
10519.1	5/2$^+$	8441.4	4.2	2076.01	7/2$^+$	D+Q	+0.43 *2*	Mult.: A_2=−0.68 *2* (1989Ba42). δ: or +3.0 *2*. Other: +0.40 *3* or −2.9 *3* (2009Us01).
		10076.7	25	439.991	5/2$^+$	D+Q	−0.19 *3*	Mult.: A_2=0.24 *4* (1989Ba42). δ: Other: −0.18 *3* (2009Us01).
		10516.5	40	0.0	3/2$^+$	D+Q	−0.13 *2*	Mult.: A_2=−0.64 *4* (1989Ba42). δ: Also same value in 2009Us01.
10534.1		3613.2	8.4[#]	6920.61	3/2$^-$			
		5758.7	6.2[#]	4774.61	7/2$^+$			
		6855.4	8.5[#]	3677.60	3/2$^-$			
		7550.7	1.8[#]	2982.06	3/2$^+$			
		8141.8	5.2[#]	2390.732	1/2$^+$			
		8456.4	3.9[#]	2076.01	7/2$^+$			
		10091.7	11[#]	439.991	5/2$^+$			
		10531.5	55[#]	0.0	3/2$^+$			
10549.2	5/2$^+$	2657.8	1.2[#]	7891.2	5/2$^+$			
		2824.6	1.3[#]	7724.45				
		4582.3	2.8[#]	5964.4	3/2$^-$			
		4806.9	1.4[#]	5741.8	5/2$^+$			
		5170.0	3.2[#]	5378.56	5/2$^+$			
		6118.7	14[#]	4429.63	1/2$^+$			A_2=−0.205 *9*; A_4=0.103 *92*; A_6=−0.087 *95* (2006Ka65) δ: −0.11 *7* in 2006Ka65, but ΔJ=2 for the transition.
		6633.9	15[#]	3914.24	5/2$^+$	D+Q	−0.80 *12*	A_2=−0.254 *1*; A_4=0.026 *1*; A_6=0.021 *1* (2006Ka65) Mult.,δ: From 2009Us01. Other: δ=−1.0 *3* (2006Ka65).
		6870.5	0.8[#]	3677.60	3/2$^-$			
		7565.8	19[#]	2982.06	3/2$^+$	D(+Q)	−0.05 *7*	A_2=−0.091 *105*; A_4=−0.079 *117*; A_6=0.018 *114* (2006Ka65) Mult.,δ: From 2009Us01. Other: δ=−0.04 *8* (2006Ka65).
		8156.9	9.2[#]	2390.732	1/2$^+$			A_2=−0.592 *127*; A_4=0.109 *119*; A_6=−0.077 *1* (2006Ka65)
		8471.5	3.4[#]	2076.01	7/2$^+$	D+Q	−0.07 *6*	Mult.,δ: From 2009Us01 and 2005Vo22. Other: δ=−0.7 *7* (2006Ka65).
		10106.8	8.7[#]	439.991	5/2$^+$	D+Q[e]	−0.19[e] *8*	A_2=−0.552 *136*; A_4=0.054 *113*; A_6=0.058 *110* (2006Ka65) δ: Other: δ=−2.0 *5* (2009Us01).
		10546.6	20[#]	0.0	3/2$^+$	D+Q	+0.19 *6*	A_2=0.041 *109*; A_4=−0.011 *117*; A_6=−0.040 *123* (2006Ka65) Mult.,δ: From 2009Us01. Other: δ=+0.21 *9* (2006Ka65).
10574.6	3/2$^-$	3753.5	4.2[#]	6819.6	5/2			
		5195.4	1.8[#]	5378.56	5/2$^+$			
		6144.1	3.1[#]	4429.63	1/2$^+$			

$^{23}_{11}Na_{12}$-27

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01 (continued)

γ(^{23}Na) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ[d]	Comments
10574.6	3/2$^-$	6659.3	3.1[#]	3914.24	5/2$^+$			
		6725.5	27[#]	3848.07	5/2$^-$			
		6895.9	4.2[#]	3677.60	3/2$^-$			
		7591.2	2.5[#]	2982.06	3/2$^+$			
		7933.3	1.9[#]	2639.86	1/2$^-$			
		8182.3	8.2[#]	2390.732	1/2$^+$			
		10132.2	44[#]	439.991	5/2$^+$			
10616.9	5/2$^+$,3/2$^+$	3748.9	4.8[#]	6867.7	5/2$^+$,(3/2$^+$)			
		4850.3	6.0[#]	5766.03	3/2$^+$			
		6701.6	8.5[#]	3914.24	5/2$^+$	D(+Q)[e]	+0.5[e] *11*	A_2=0.614 *135*; A_4=0.091 *110*; A_6=0.126 *140* (2006Ka65)
		6938.2	16[#]	3677.60	3/2$^-$	D+Q[e]	−0.6[e] *5*	A_2=−0.614 *136*; A_4=−0.053 *123*; A_6=0.109 *111* (2006Ka65)
		8224.6	3.0[#]	2390.732	1/2$^+$			
		8539.2	4.4[#]	2076.01	7/2$^+$			
		10174.5	54[#]	439.991	5/2$^+$	D(+Q)[e]	+0.5[e] *10*	A_2=0.564 *119*; A_4=−0.070 *106*; A_6=−0.002 *106* (2006Ka65)
		10614.3	3.3[#]	0.0	3/2$^+$			

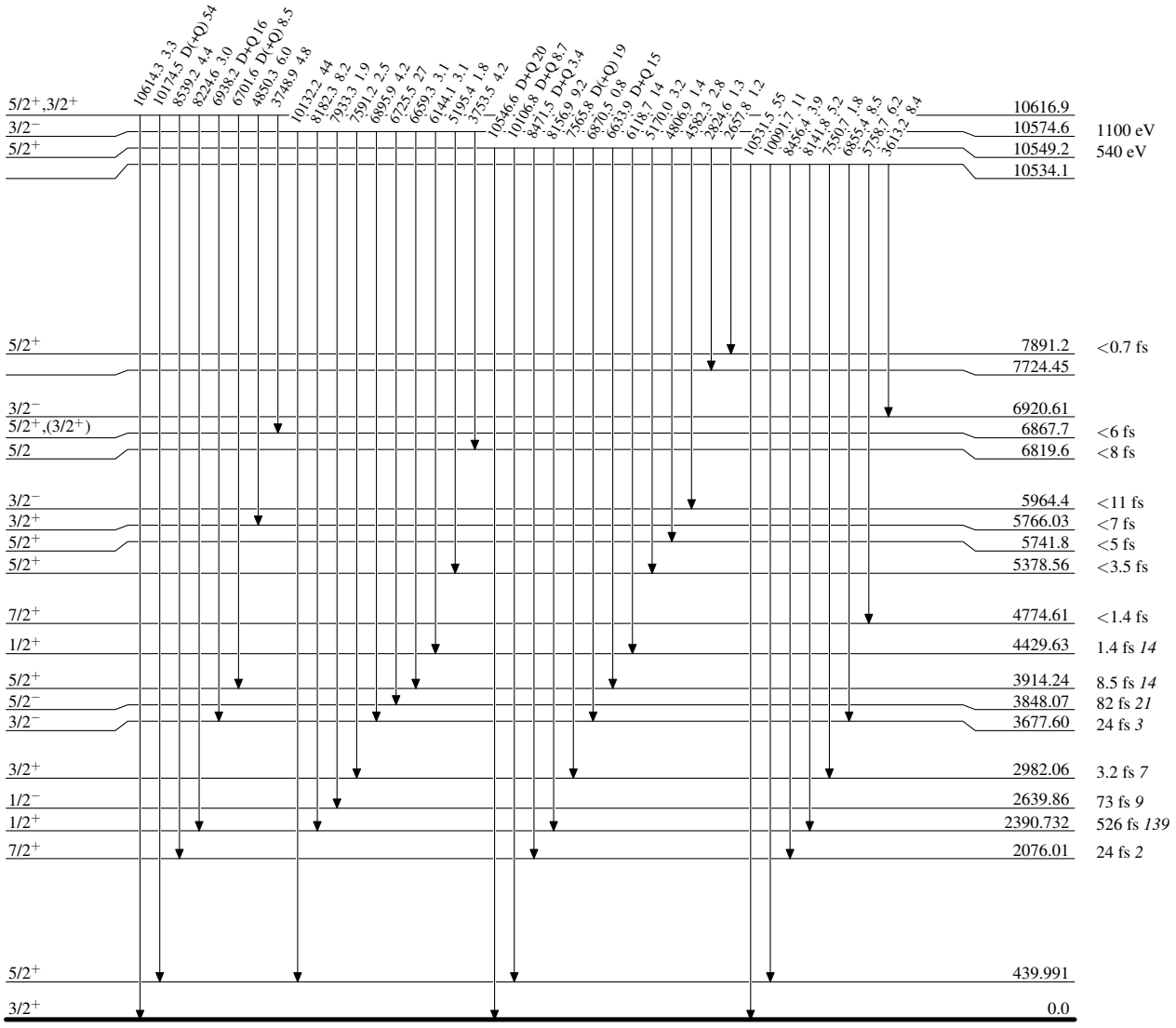
[†] From level energy differences, recoil energy subtracted.
[‡] From 1989Ba42, except otherwise noted.
[#] From 1979Sm02.
[@] From 1973Me11.
[&] From 2017Ke01. Recommended values of 2017Ke01 for 8975.3 (E_r=178) and 9211.0 keV (E_r=417) levels are listed. The recommended value is the arithmetic mean of values from singles and coincidence measurements.
[a] From 2015Ke05. New primary γ to 7082-keV level (2170γ).
[b] From 2016De34.
[c] From 2015De33.
[d] From 1989Ba42, except otherwise noted.
[e] From 2006Ka65. Sign from calculated reduced probabilities and the RUL, 2006Ka65 note. Evaluators assign without sign in this dataset.
[f] For weighted/unweighted average values of 2018Fe04 and 2016De34 are scaled by a ratio of Iγ(8533.6)(2017Ke01)/Iγ(8533.6)(2018Fe04) or Iγ(8533.6)(2017Ke01)/Iγ(8533.6)(2016De34).

$^{23}_{11}Na_{12}$-28

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme

Intensities: % photon branching from each level

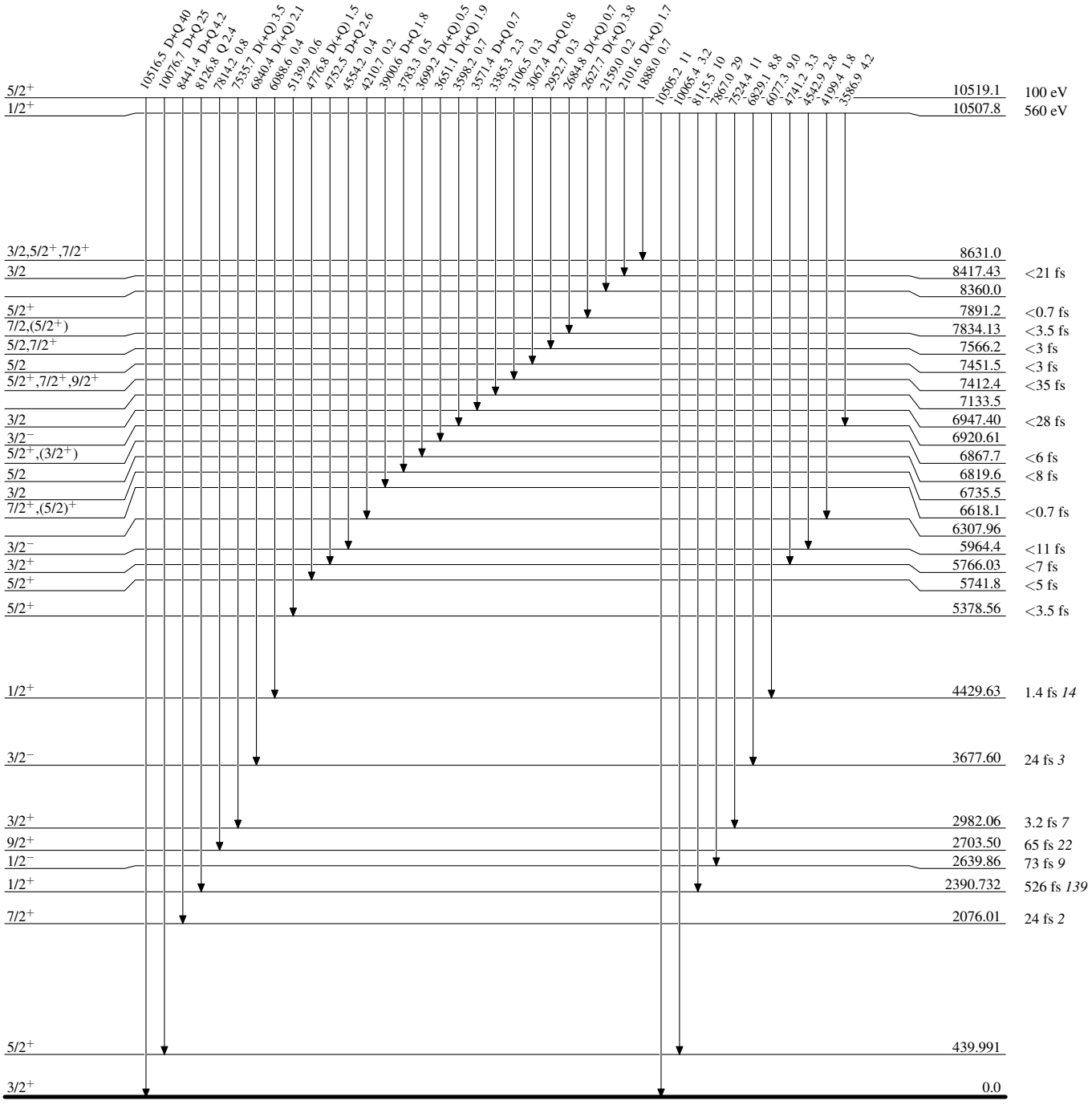


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

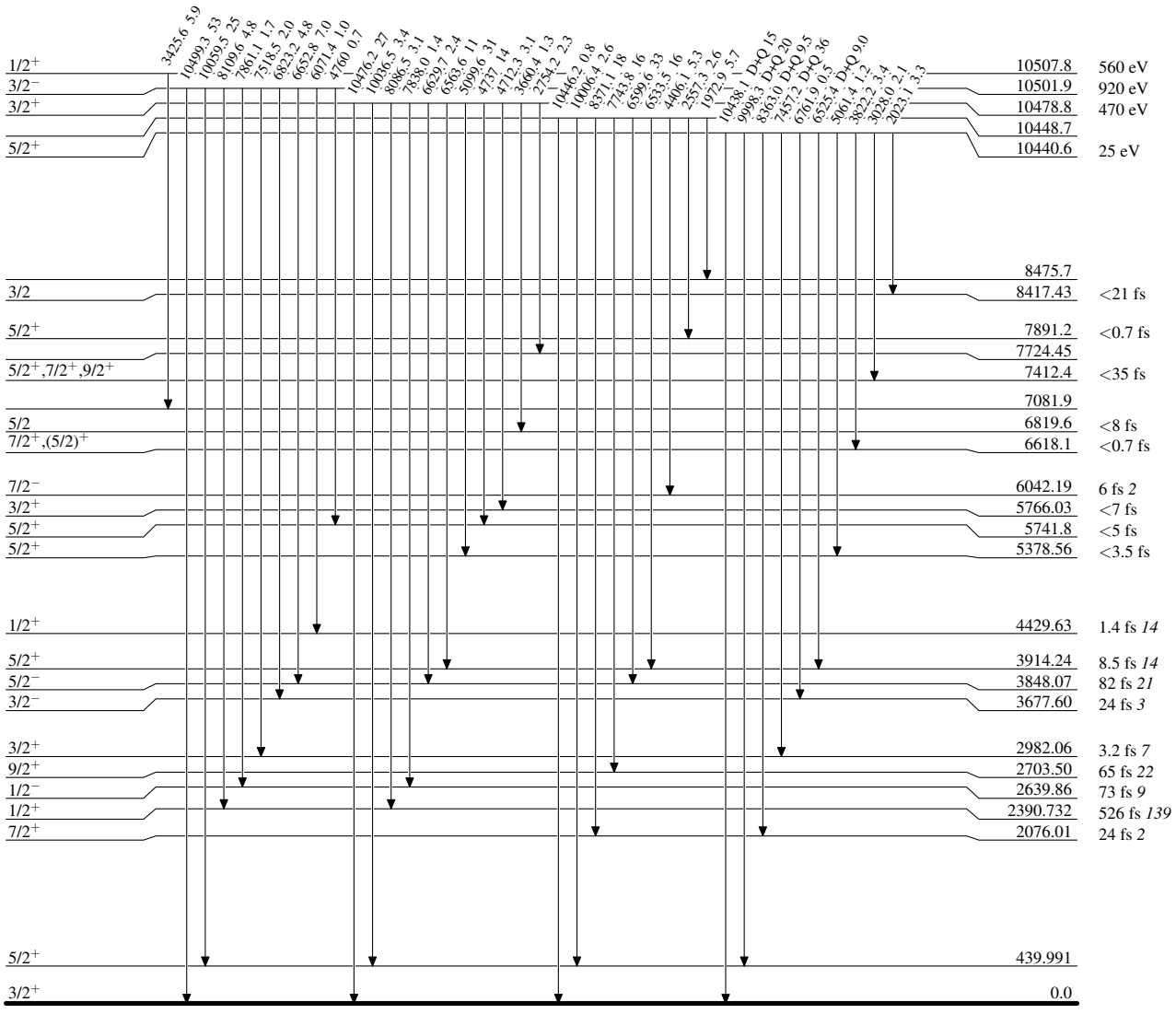


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

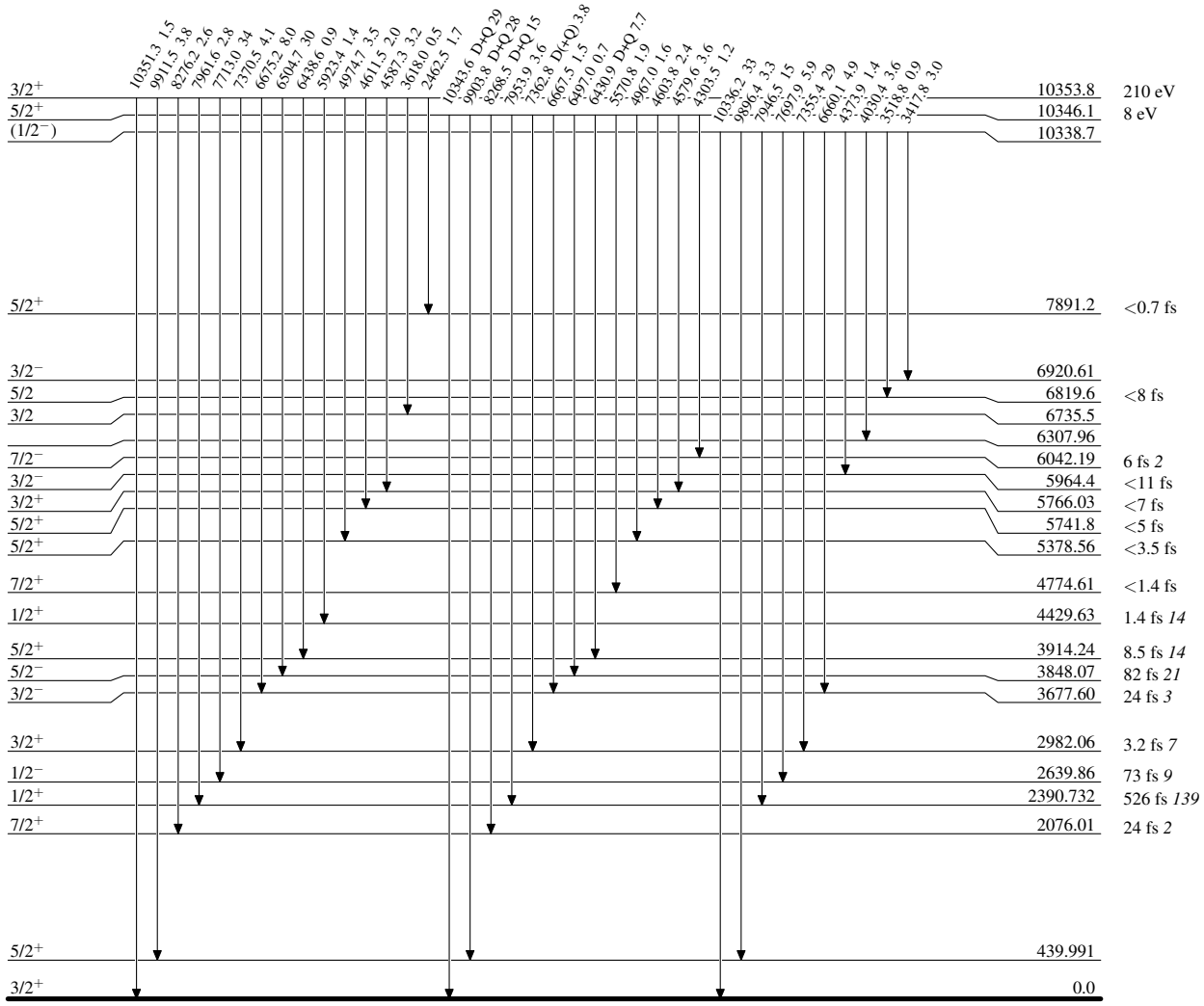


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

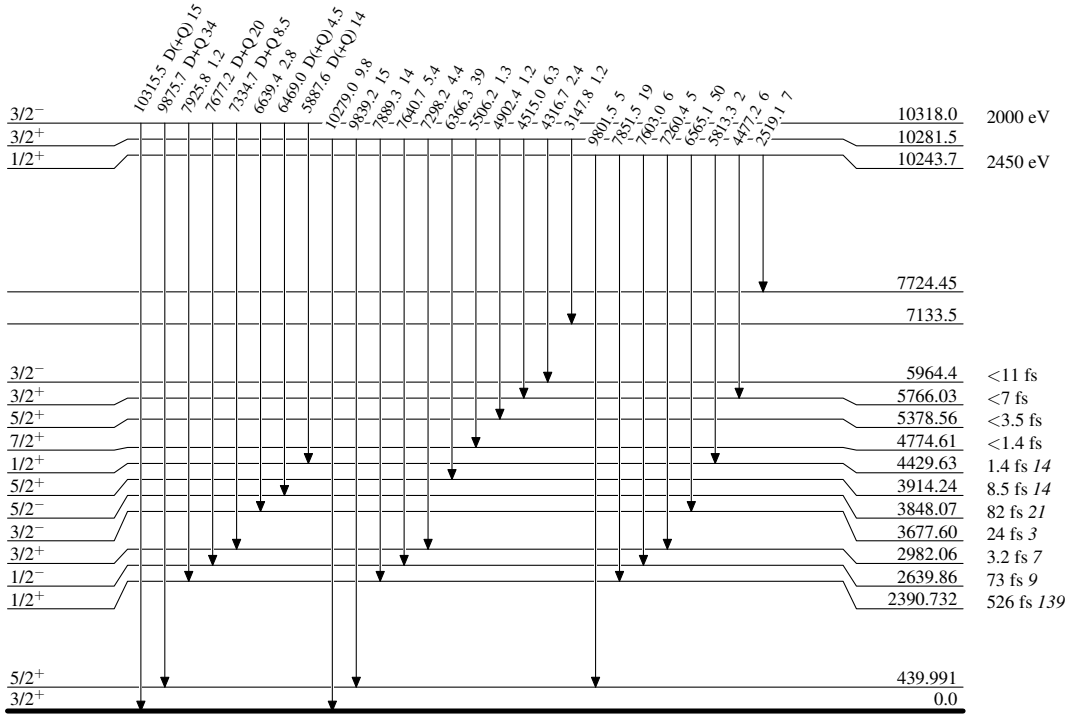


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

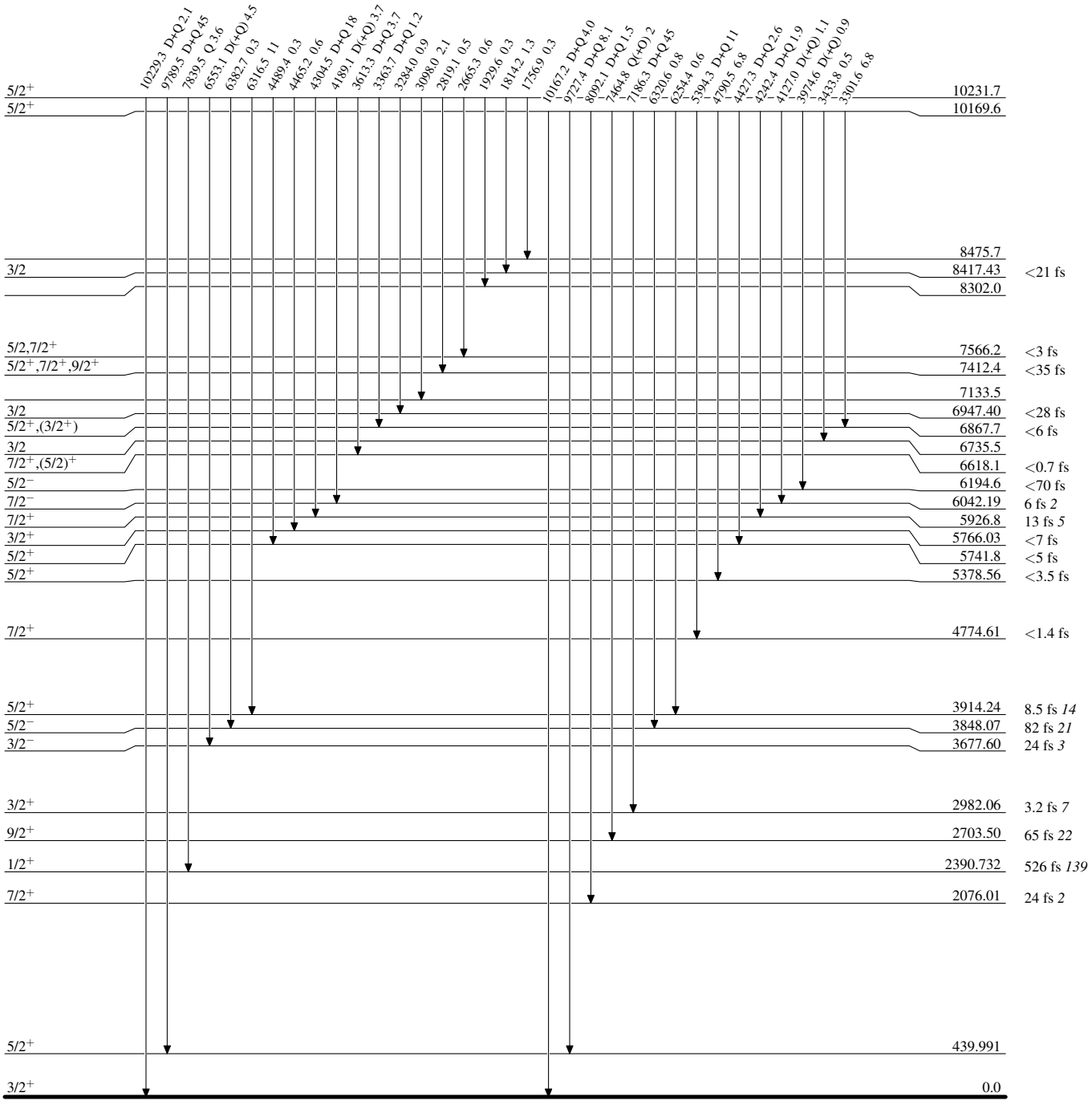


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

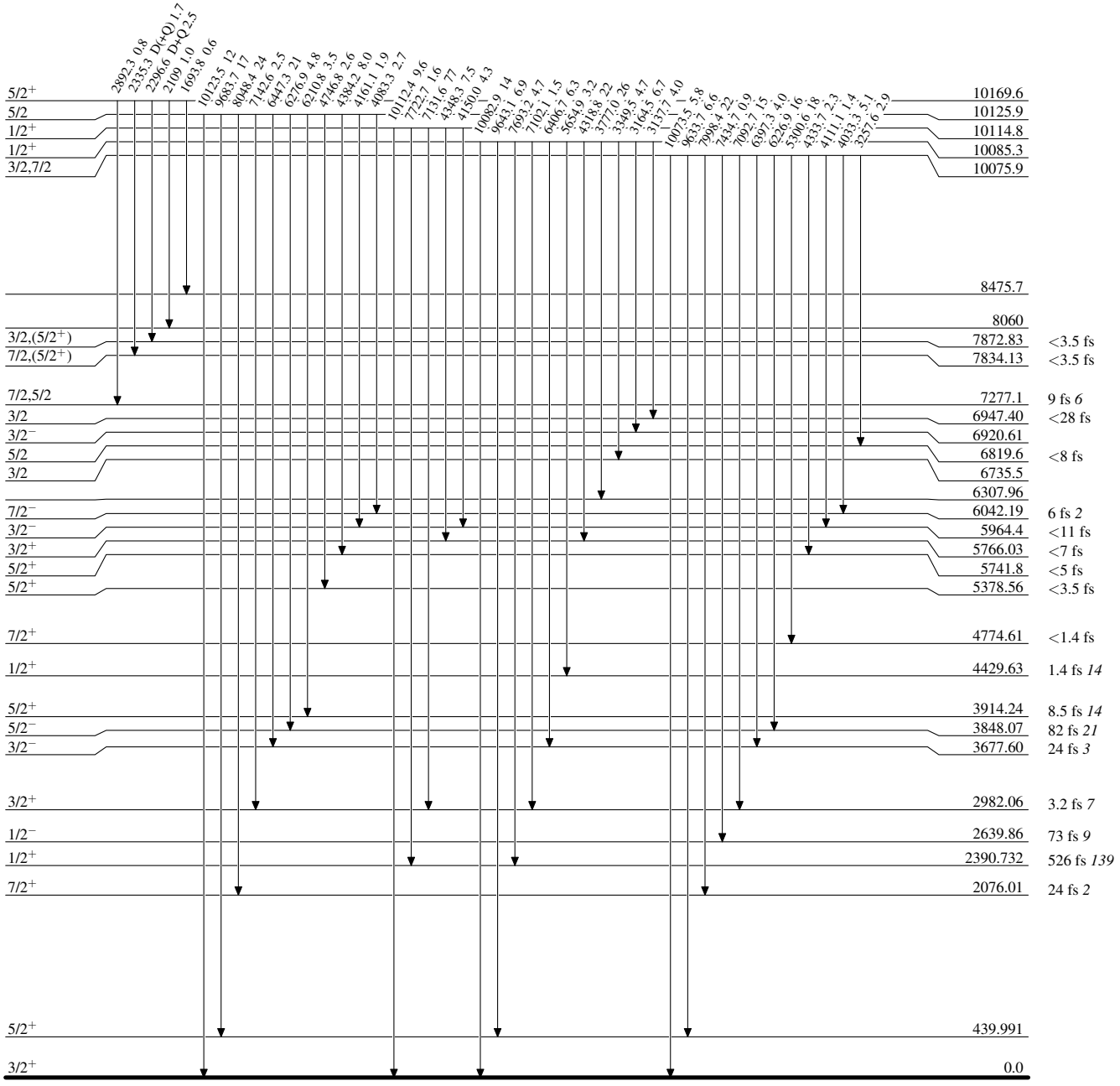


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

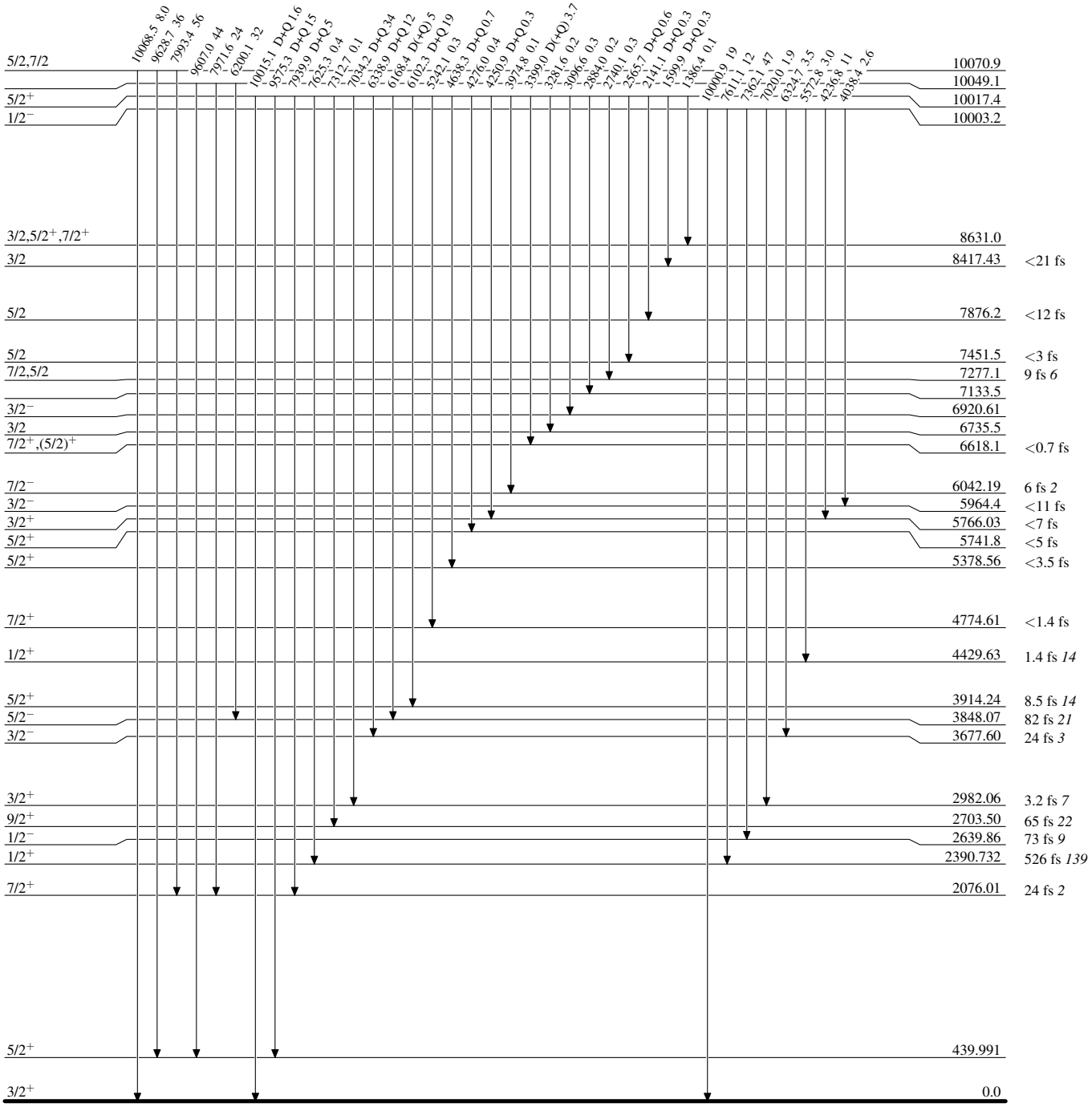


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

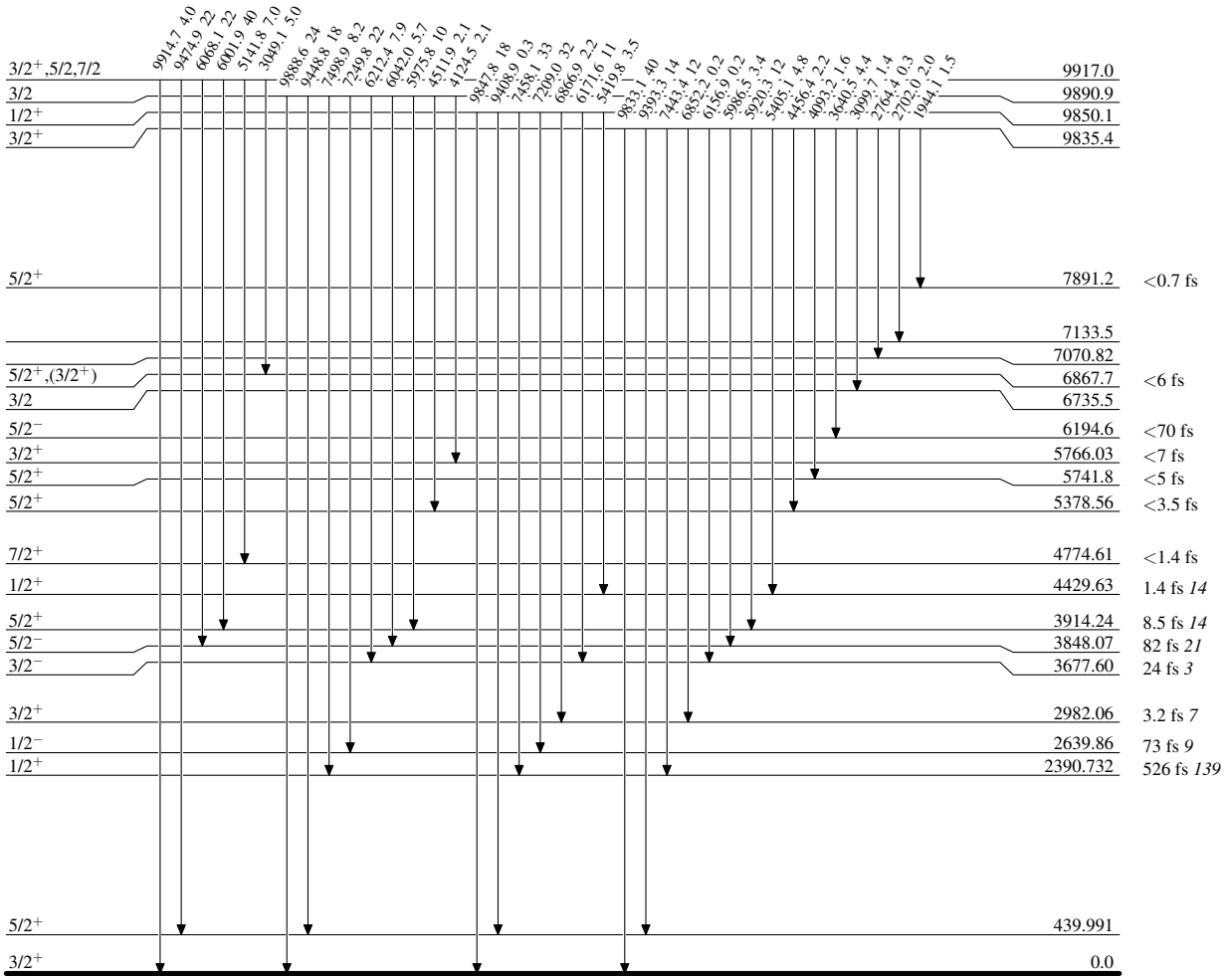


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

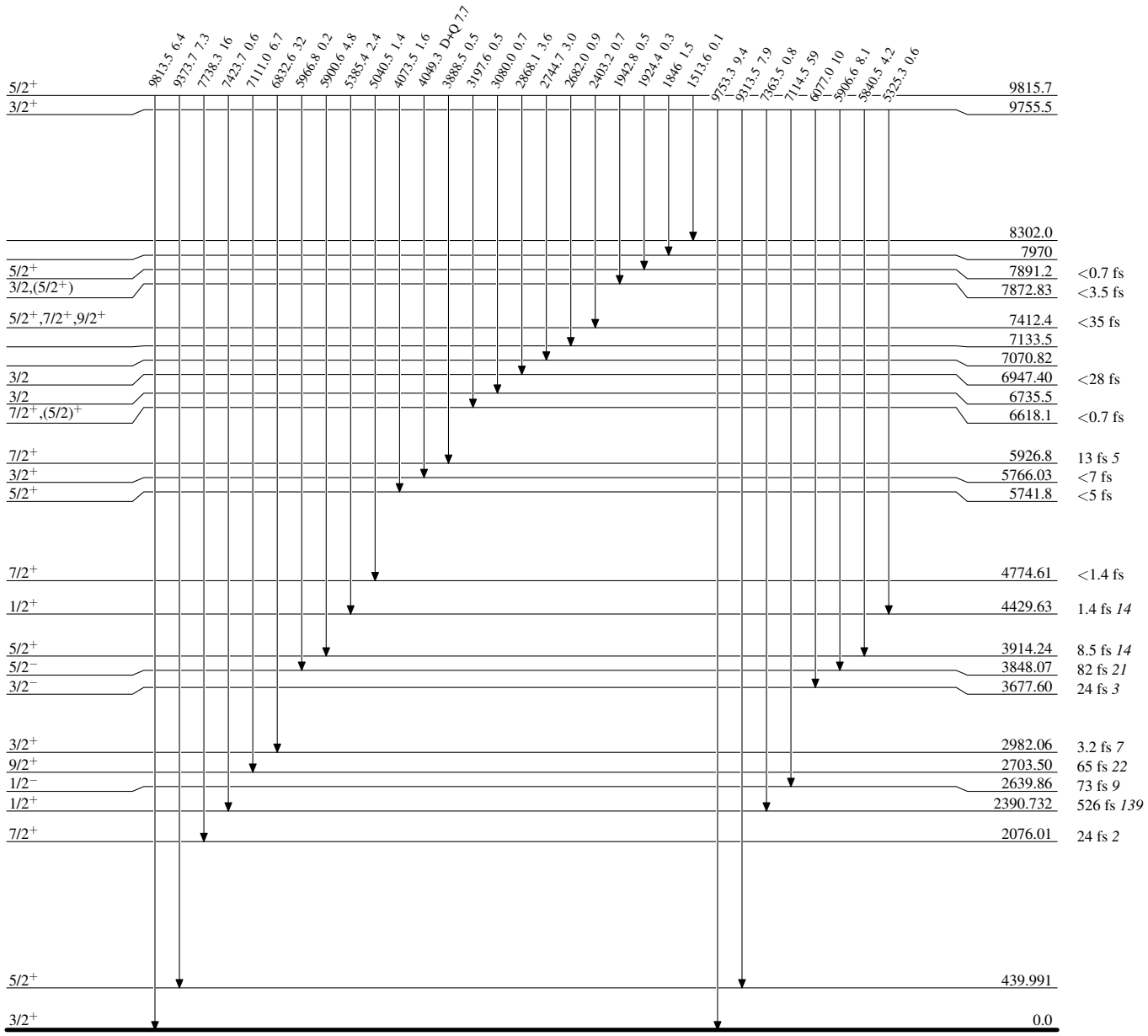


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

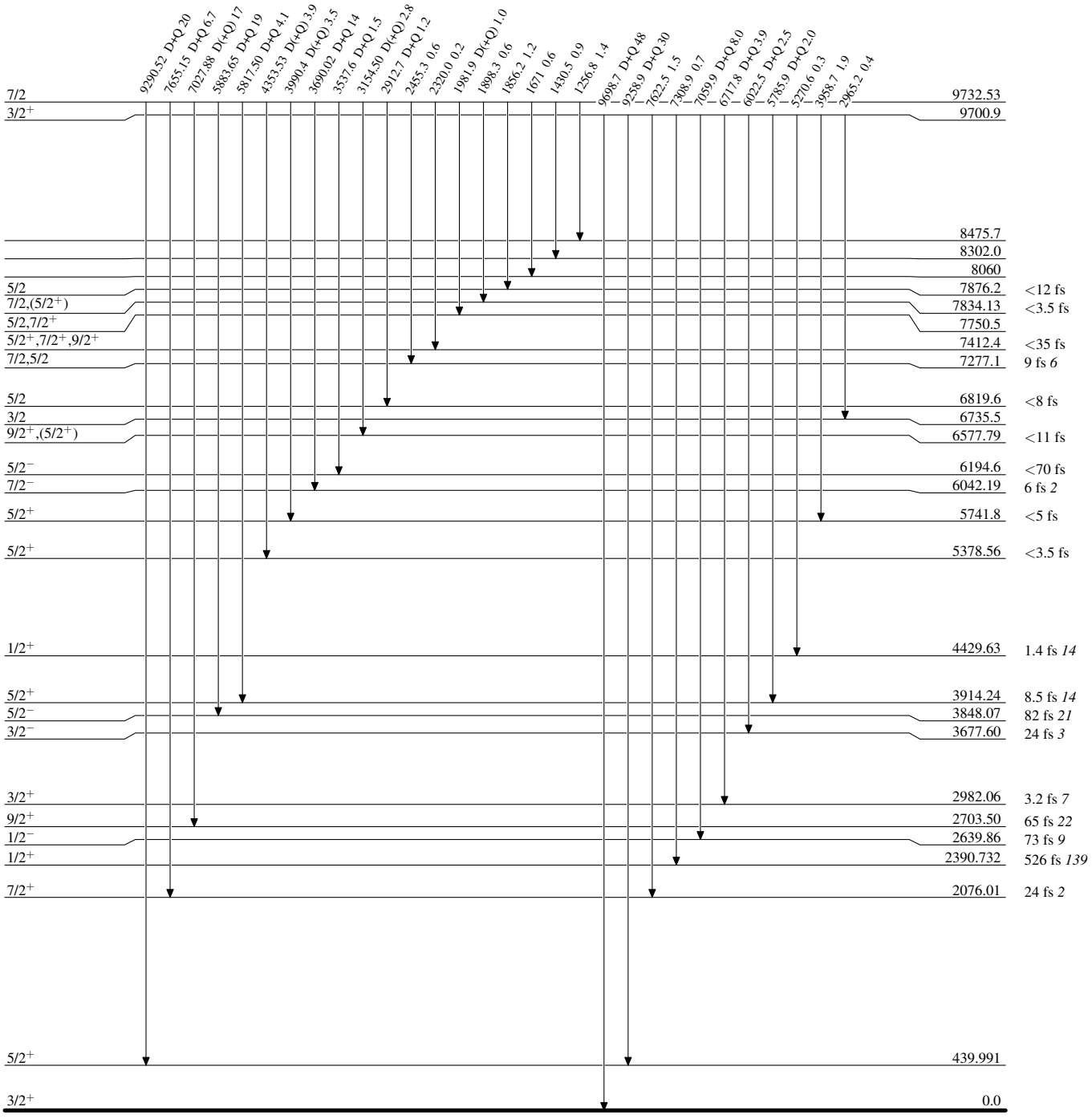


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

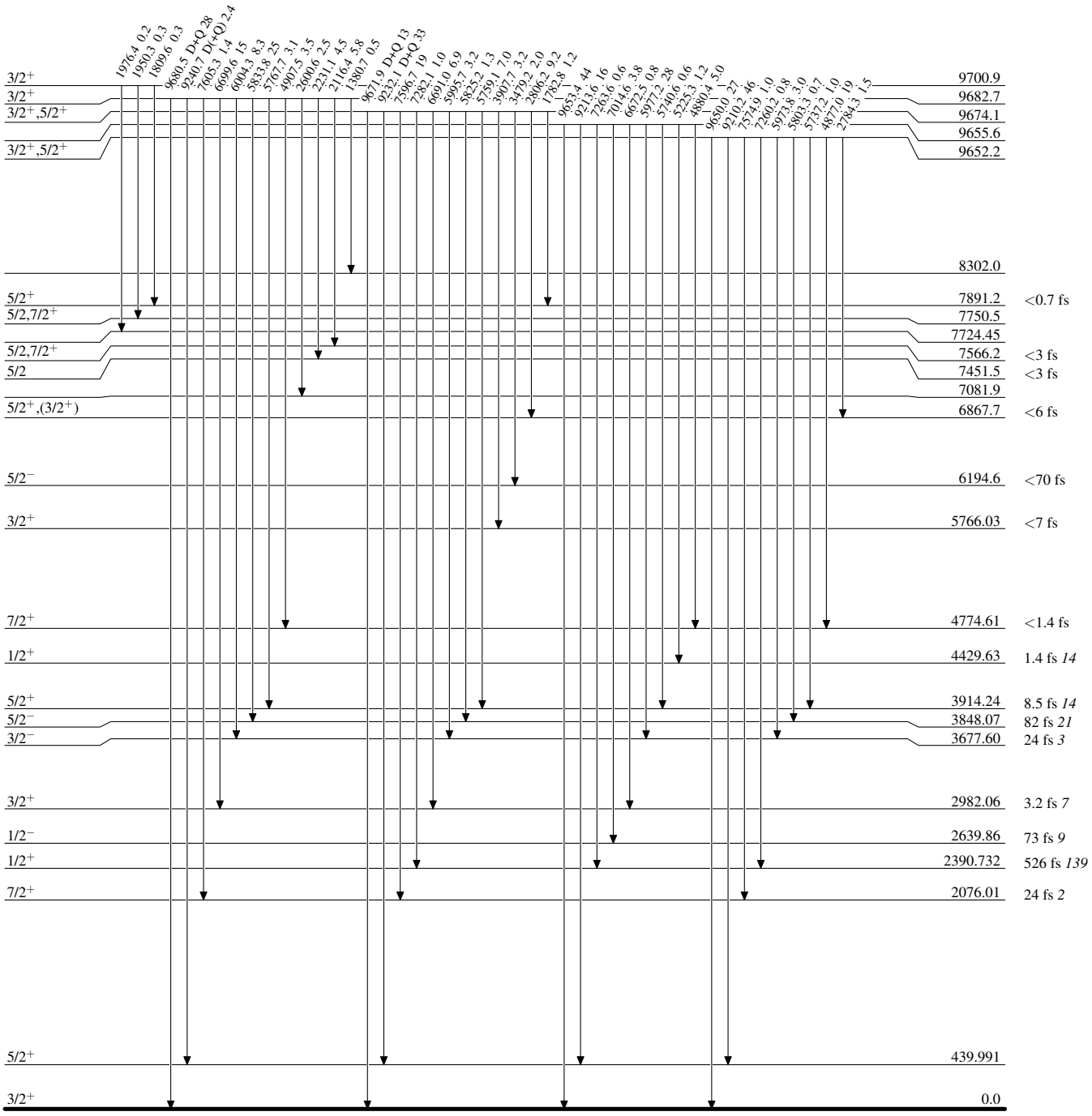


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

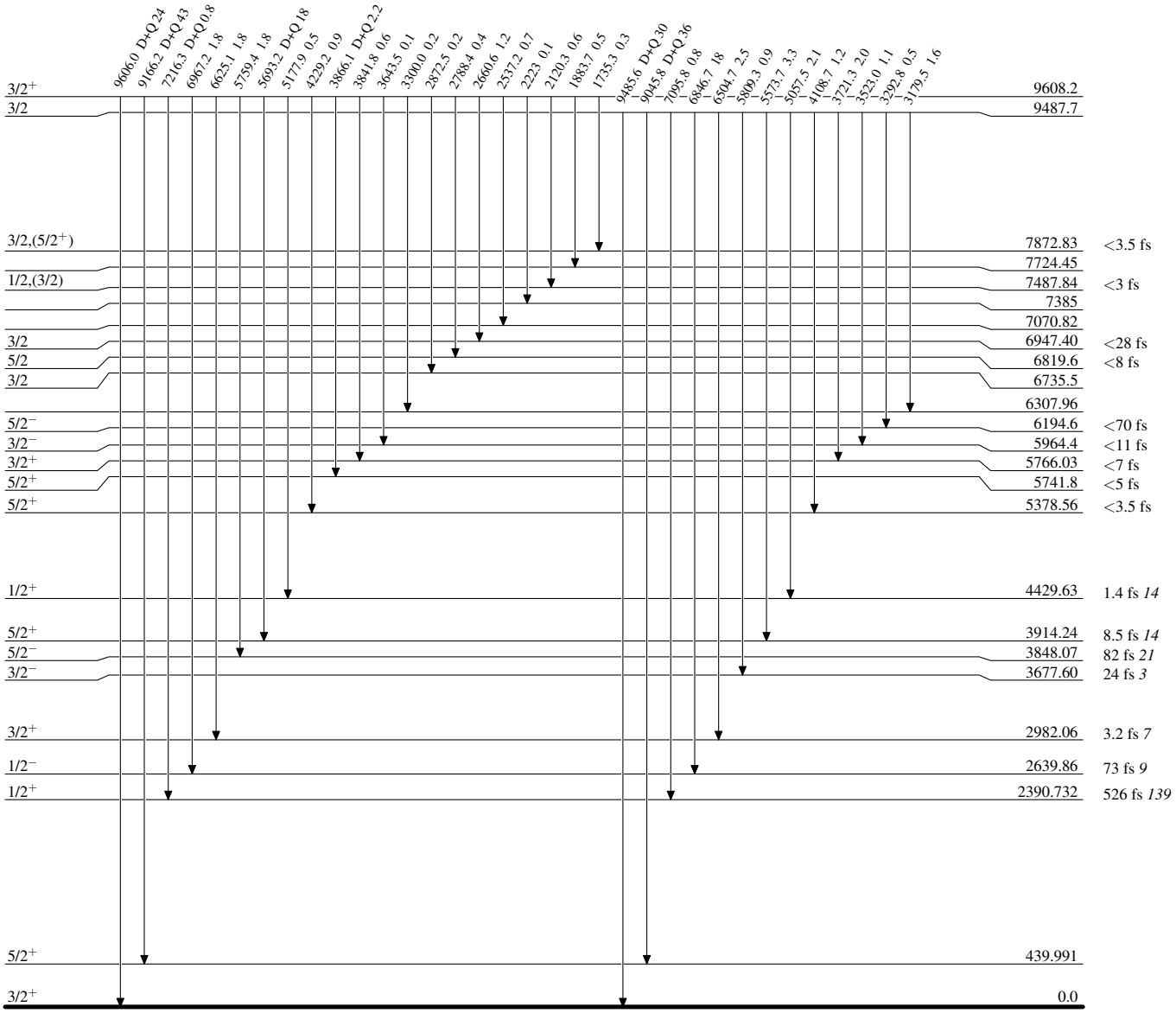


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

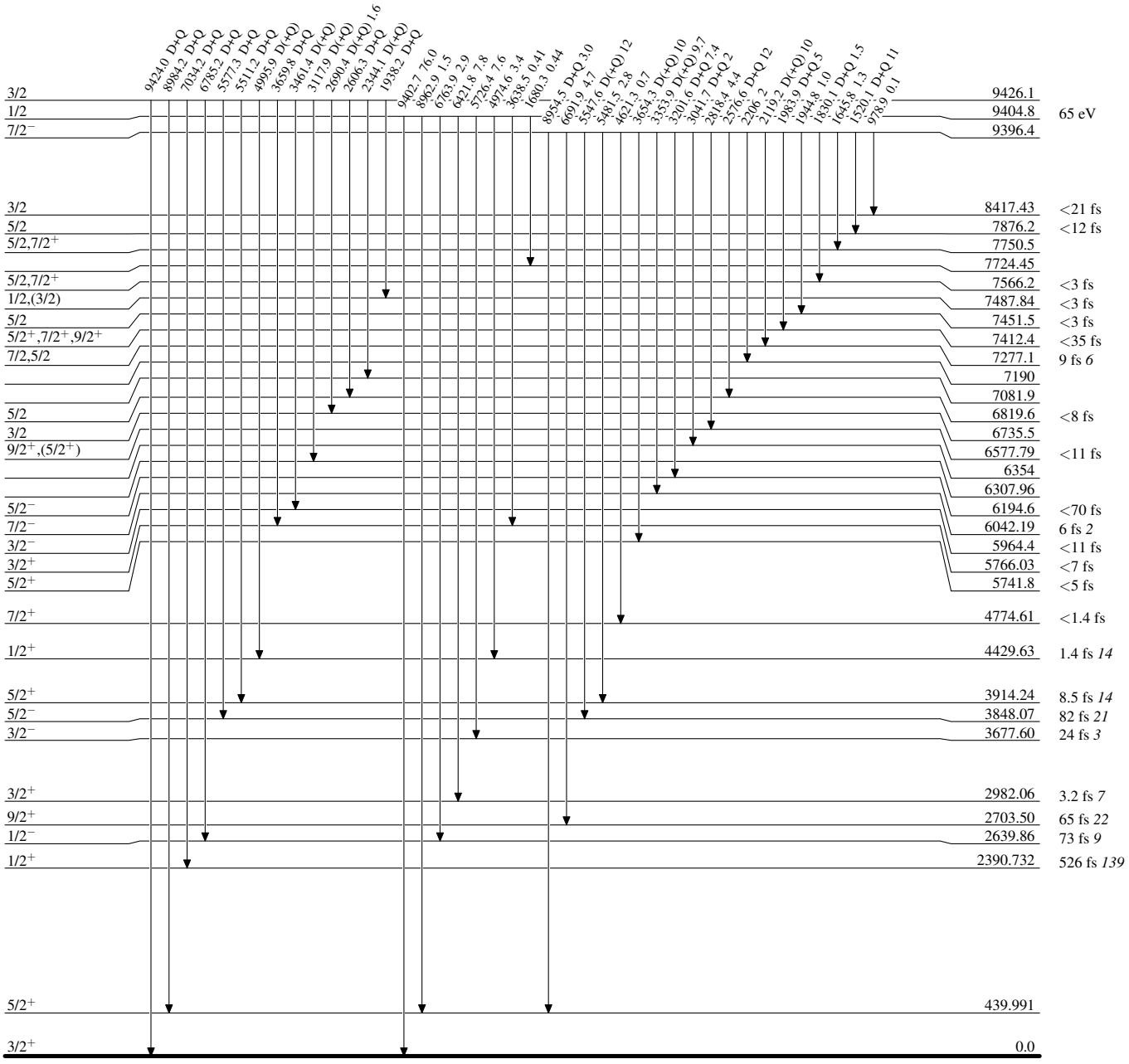


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

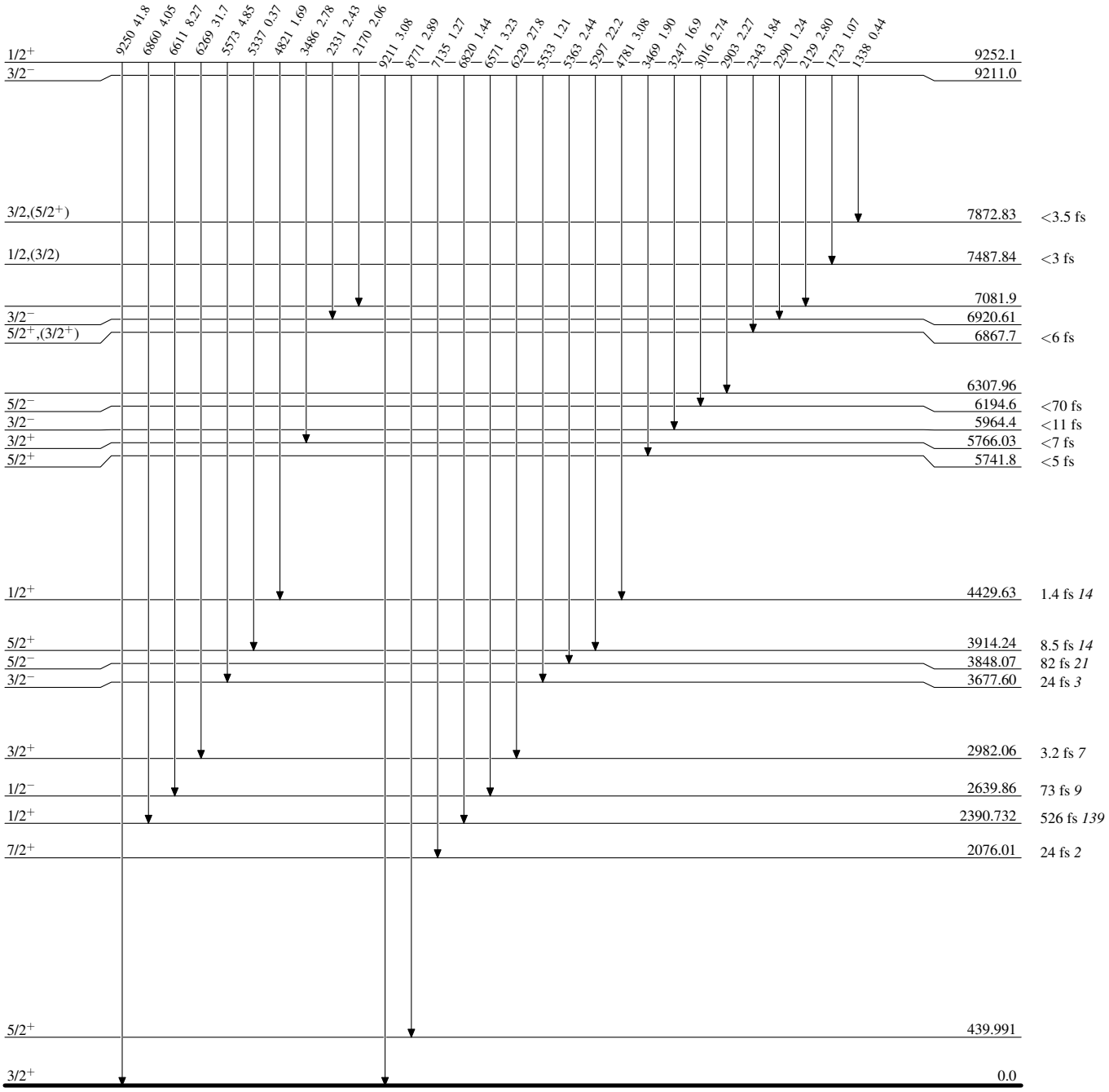


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level



$^{23}_{11}Na_{12}$

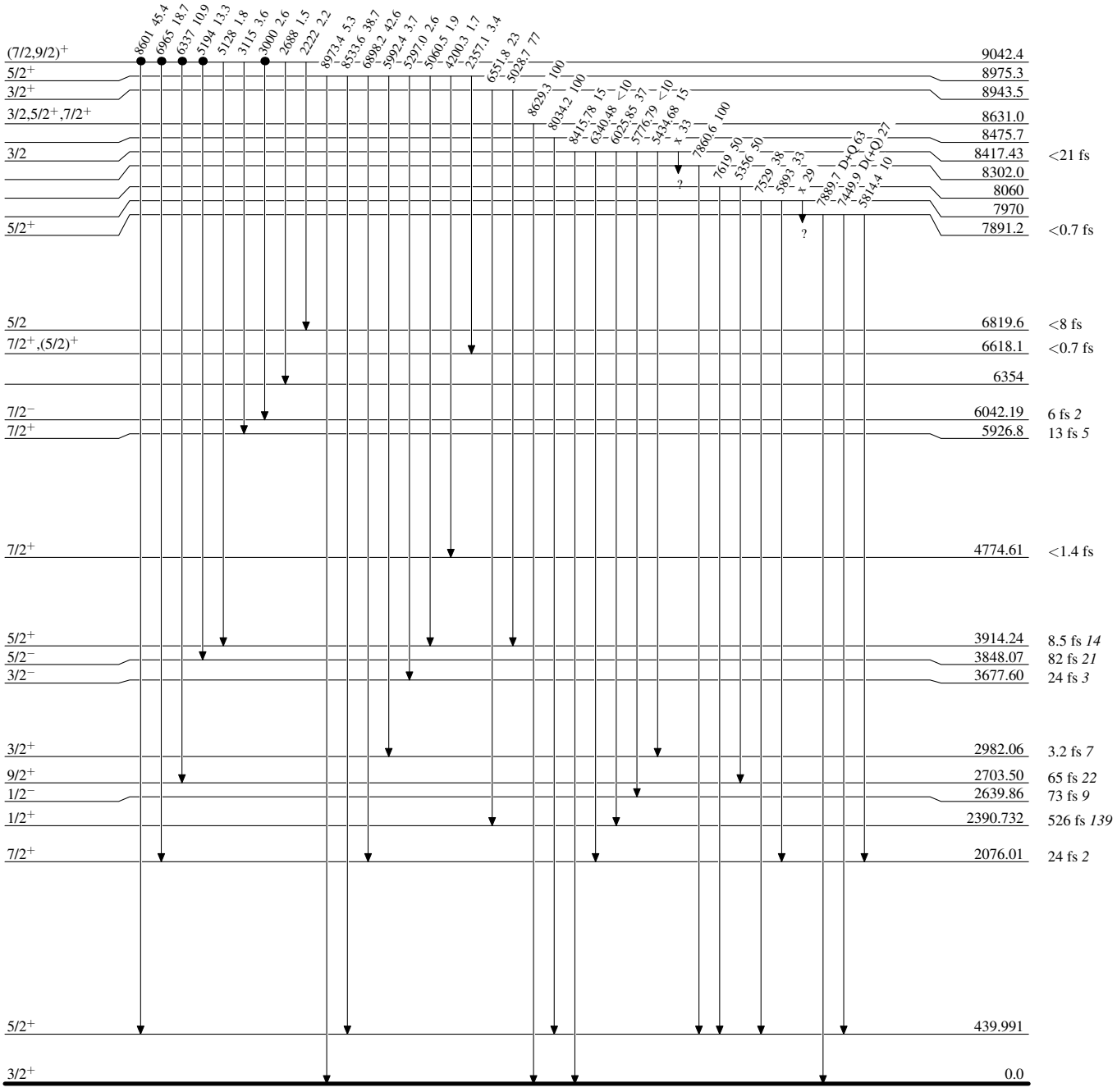
^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

● Coincidence

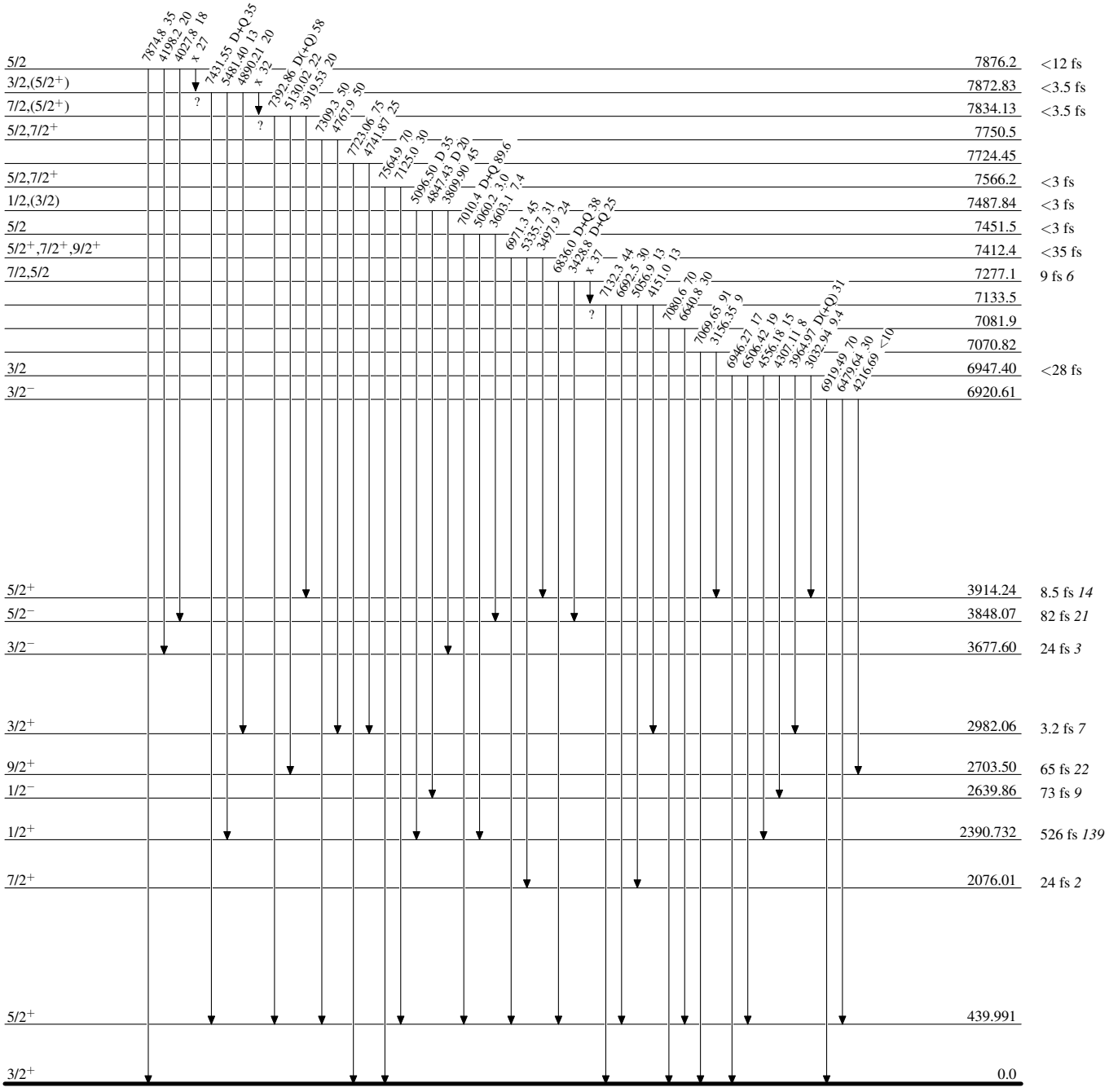


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

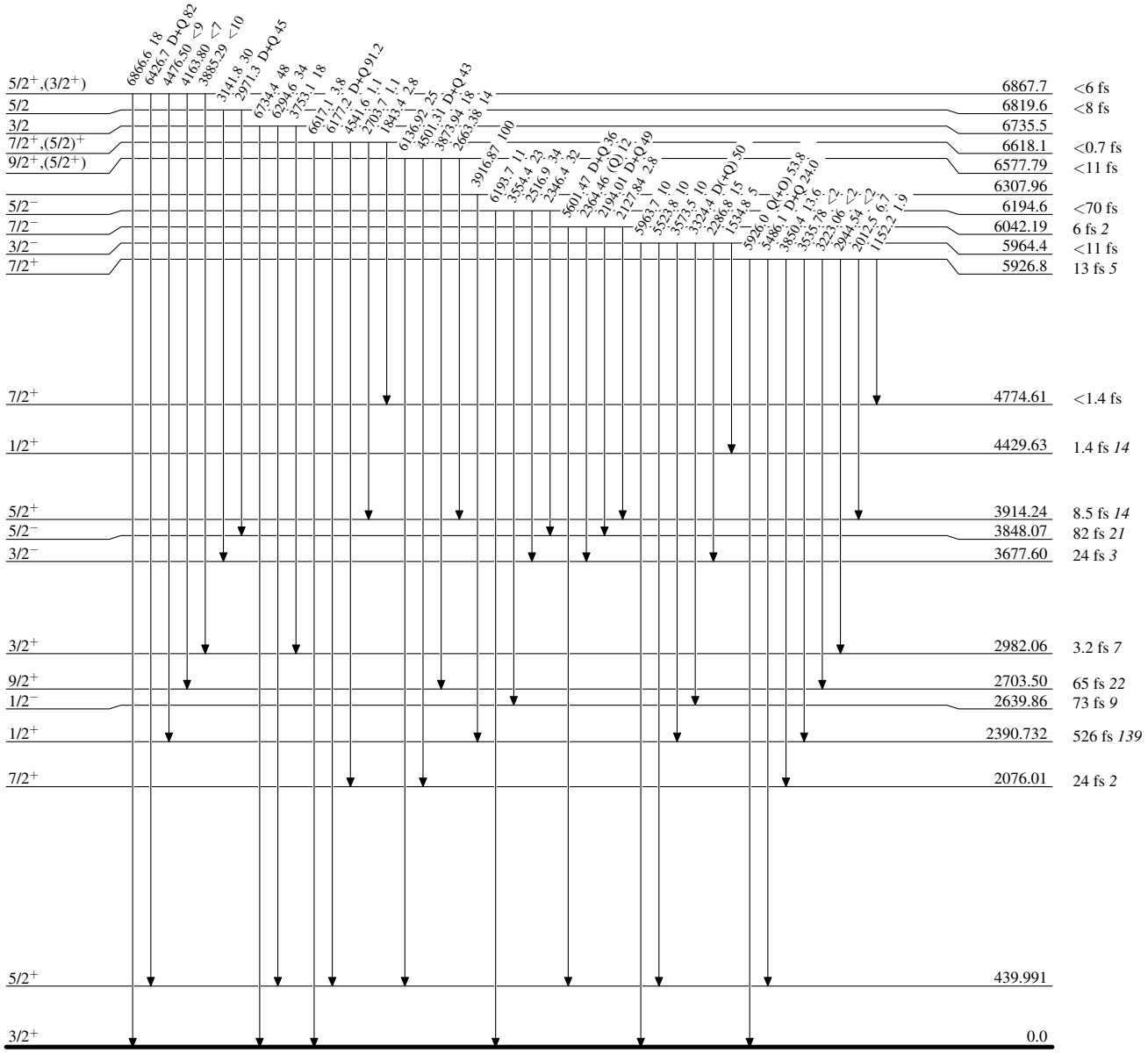
Intensities: % photon branching from each level



^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

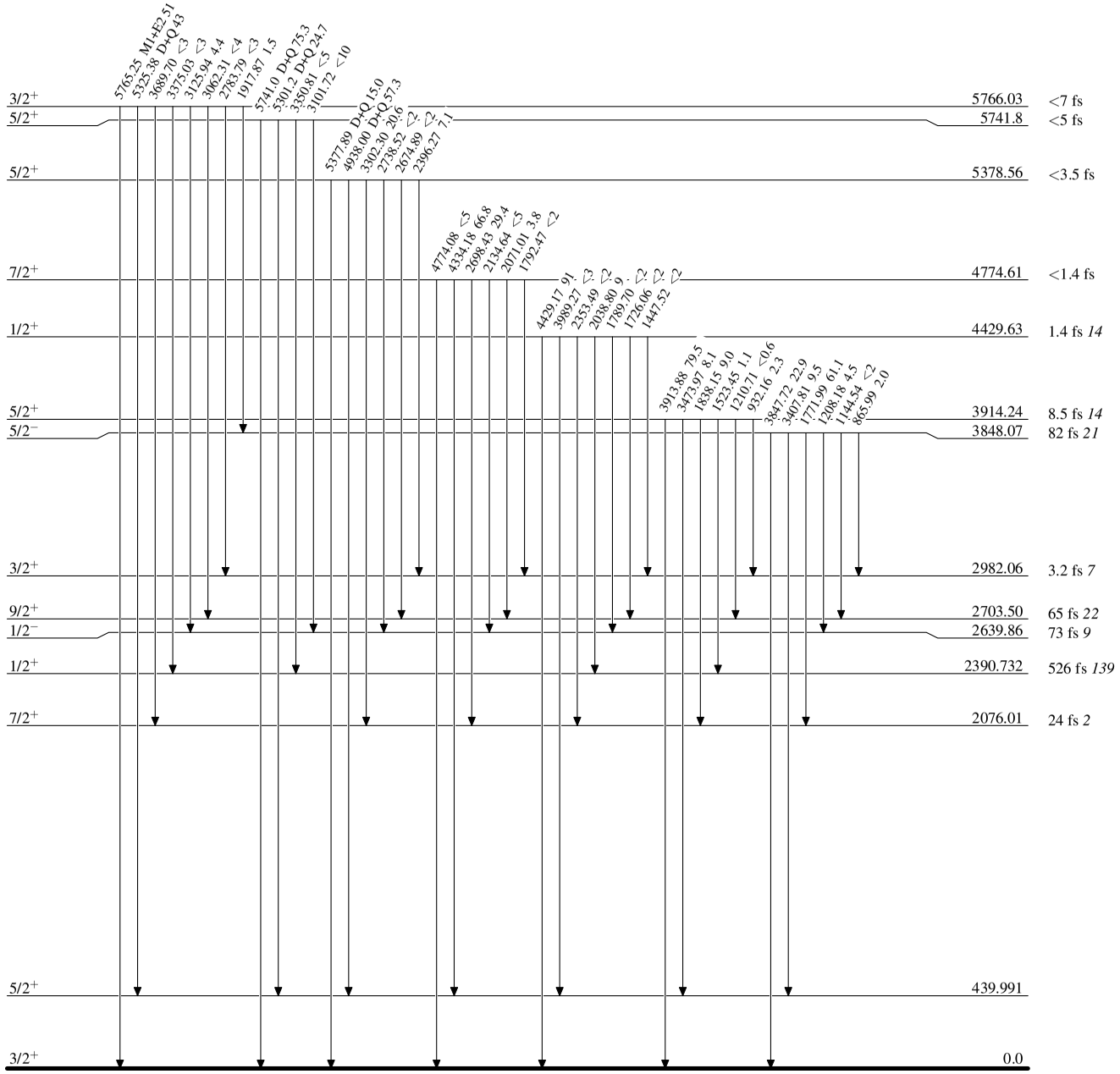


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level

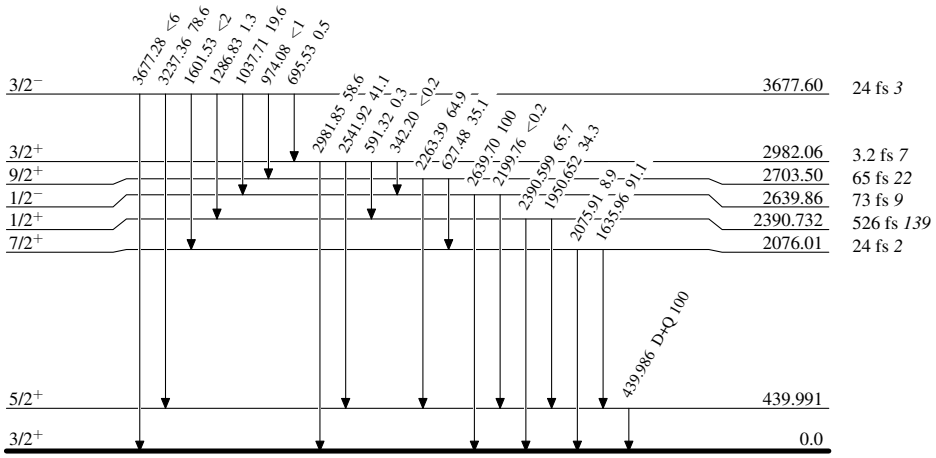


$^{23}_{11}Na_{12}$

^{22}Ne(p,γ) 1989Ba42,1979Sm02,2017Ke01

Level Scheme (continued)

Intensities: % photon branching from each level



$^{23}_{11}Na_{12}$