

²³Na(γ,γ') 1984Vo02

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

Other references: [1962Mo17](#),[1963Sw01](#),[1966Sk01](#),[1966Ra19](#),[1969Ru01](#),
[1970Sh08](#),[1971Ra13](#),[1971Sw04](#),[1972Fr10](#),[1972Sh07](#),[1982Is01](#),[1985Ba36](#).
[1984Vo02](#): ²³Na(γ,γ') E=7.66, 10.37 MeV. Measured E γ , I γ .
[1985Ba36](#): ²³Na(γ,γ') E=7.89, 4.43 MeV. Measured $\sigma(E\gamma)$.

²³Na Levels

E(level) [†]	J π [‡]	T _{1/2} [#]	Comments
0.0			
440		1.14 ps 7	T _{1/2} : From $\tau=1.64$ ps 10: Wt. ave. of 1.8 ps 2 (1969Ru01), 1.62 ps 10 (1966Sk01), 1.80 ps 28 (1962Mo17), and 1.30 ps 30 (1963Sw01).
2076			
2390 1			
2640 1			
2982 1	3/2 ⁺	2.6 fs 5	T _{1/2} : Other value: 4.6 fs 19 (1972Sh07).
3915 1	5/2 ⁺	9.4 fs 16	
4432 15	1/2 ⁺	0.21 fs 3	T _{1/2} : Wt. ave. of 0.24 fs 5 (1984Vo02), 0.24 fs 5 (1985Ba36), and 0.17 fs 3 (1972Sh07).
5380	5/2 ⁺	143 as 21	T _{1/2} : Other value: 223 as 42 (1972Sh07).
5741 15	5/2 ⁺	394 as 27	T _{1/2} : Other value: 577 as 109 (1972Sh07).
5766 15	3/2 ⁺	351 as 45	T _{1/2} : Other value 608 as 116 (1972Sh07).
6735 2	3/2 ⁺	415 as 50	T _{1/2} : Other value: 1.2 fs 3 (1972Sh07).
7070 2			T _{1/2} : (109 as 11)/(2J _f +1) (1984Vo02).
7082 2	3/2 ⁻	258 as 31	T _{1/2} : Other value: 400 as 80 (1972Sh07).
7122 3	(9/2)	13 fs 5	
7134 3	3/2 ⁺ ,5/2 ⁺	200 as 26	T _{1/2} : Weighted average of 196 as 48 (1984Vo02), 184 as 34 (1972Sh07), 300 as 80 (1971Sw04) for J _f =3/2.
7566 2	(5/2) ⁺	0.26 fs 18	
7890 2	5/2 ⁺	162 as 12	T _{1/2} : Weighted average of 152 as 12 (1985Ba36), 187 as 21 (1984Vo02), and 166 as 35 (1972Sh07).
7992 3	(11/2)	19 fs 8	
8360 2			T _{1/2} : (38 as 6)/(2J _f +1) (1984Vo02).
8630 3			T _{1/2} : (104 as 31)/(2J _f +1) (1984Vo02).
8645 2	1/2 ⁺	0.53 fs 7	
8662 2	1/2 ⁺	141 as 23	T _{1/2} : Other value 290 as 60 (1972Sh07).
8721 2			T _{1/2} : (760 as 95)/(2J _f +1) (1984Vo02).
8826 2	1/2 ⁺	211 as 70	
9213 3	3/2 ⁻	4.1 fs 15	
9626 3	1/2 ⁺	2.2 fs 8	

[†] From [1984Vo02](#).

[‡] From Adopted Levels.

[#] From measured level widths g Γ_0 and Γ_0/Γ ratios of [1972Sh07](#), [1984Vo02](#) where g=(2J_f+1)/(2J_i+1) and J_i=3/2.
T_{1/2}=4.562×10⁻¹⁶(eV.s)/ Γ (eV).

γ (²³Na)

E _i (level)	J _i π	E _{γ} [†]	E _f	Mult.	δ	Comments
2390		2390	0.0			
2640		2640	0.0			
2982	3/2 ⁺	2542	440	D+Q	+0.15 5	Mult., δ : From 1971Ra13 .
		2982	0.0			

Continued on next page (footnotes at end of table)

$^{23}\text{Na}(\gamma, \gamma')$ **1984Vo02 (continued)** $\gamma(^{23}\text{Na})$ (continued)

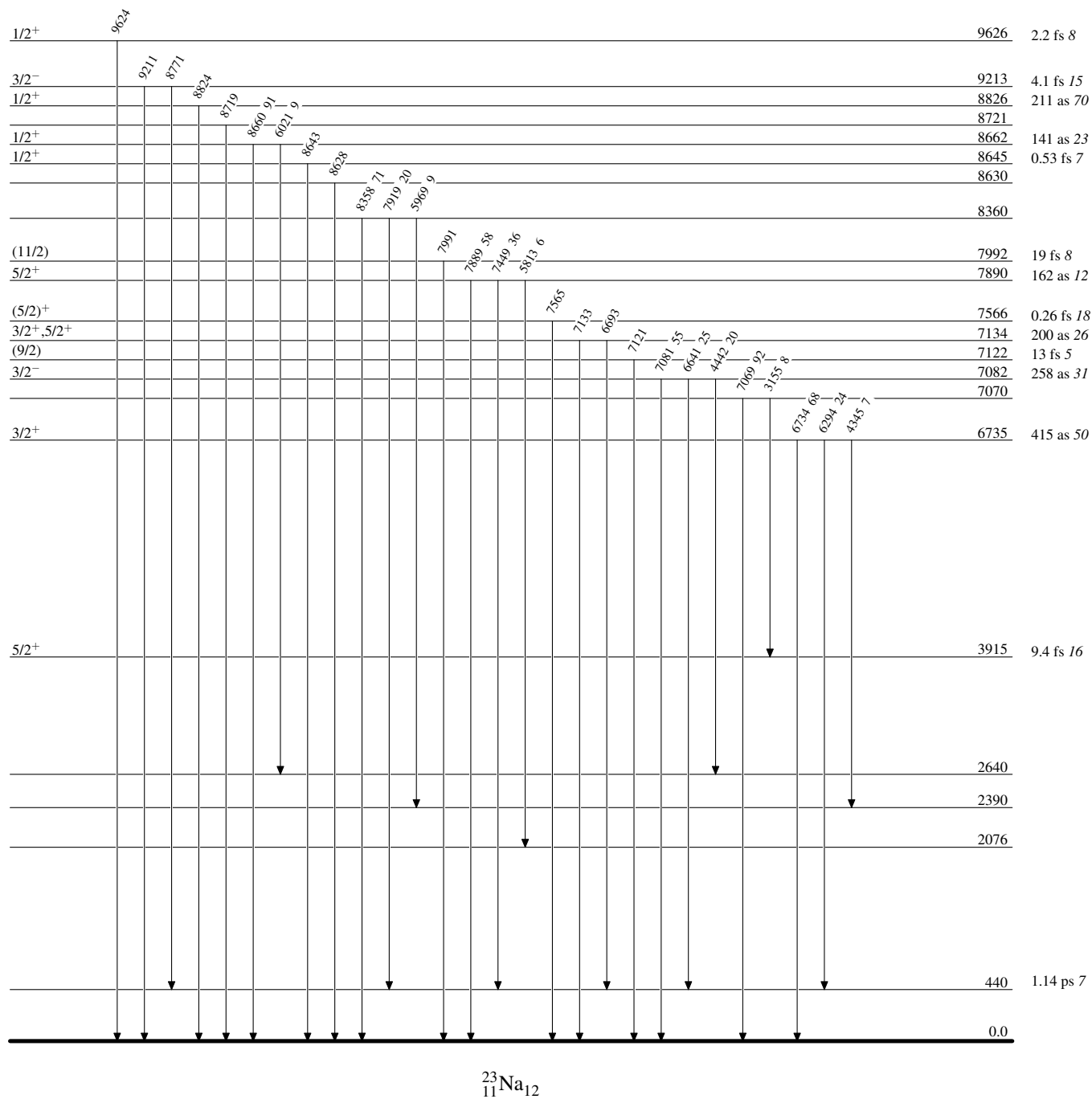
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ	E_f	J_f^π	$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ	E_f
3915	5/2 ⁺	3915		0.0		7134	3/2 ⁺ , 5/2 ⁺	6693		440
4432	1/2 ⁺	4432		0.0				7133		0.0
5380	5/2 ⁺	3304	20 1	2076		7566	(5/2) ⁺	7565		0.0
		4939	66 6	440		7890	5/2 ⁺	5813	6 1	2076
		5379	14 1	0.0				7449	36 3	440
5741	5/2 ⁺	5300	30 3	440				7889	58 4	0.0
		5740	70 3	0.0		7992	(11/2)	7991		0.0
5766	3/2 ⁺	3376	6 1	2390		8360		5969	9 2	2390
		5325	41 4	440				7919	20 1	440
		5765	53 5	0.0				8358	71 3	0.0
6735	3/2 ⁺	4345	7 1	2390		8630		8628		0.0
		6294	24 3	440		8645	1/2 ⁺	8643		0.0
		6734	68 4	0.0		8662	1/2 ⁺	6021	9 1	2640
7070		3155	8 1	3915	5/2 ⁺			8660	91 4	0.0
		7069	92 3	0.0		8721		8719		0.0
7082	3/2 ⁻	4442	20 2	2640		8826	1/2 ⁺	8824		0.0
		6641	25 4	440		9213	3/2 ⁻	8771		440
		7081	55 2	0.0				9211		0.0
7122	(9/2)	7121		0.0		9626	1/2 ⁺	9624		0.0

† From level energy differences, recoil energy subtracted and rounded to nearest keV.

$^{23}\text{Na}(\gamma,\gamma')$ 1984Vo02

Level Scheme

Intensities: % photon branching from each level

 $^{23}_{11}\text{Na}_{12}$

$^{23}\text{Na}(\gamma,\gamma)$ 1984Vo02

Level Scheme (continued)

Intensities: % photon branching from each level

