^{23}Na(n,n′γ) 1989Ge09,1972Ni05,2012Ro04

History

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

Others: 1973Ab02, 1976Be64, 1977Do10, 1978Ko19, 2011Ro52, 2012Ro04, 2015Va07.
1989Ge09: Measured mean lifetime for excited levels by Doppler Shift Attenuation Method.
1972Ni05: Measured σ(Eγ). Deduce excited levels, γ-ray branching. Ge(Li) and NaI(Tl) detectors.
2012Ro04: Measured Eγ, Iγ(θ); Deduced σ, σ(θ) at 150° and 110 °. Eight HPGe detectors, placed 4 at 110° and other 4 at 150° with respect to beam direction.

^{23}Na Levels

E(level)[†]	$T_{1/2}$[‡]	Comments
0.0		
441		
2077	19 fs *6*	$T_{1/2}$: From mean lifetime 27 fs *9* (1989Ge09).
2392		
2640	270 fs *14*	$T_{1/2}$: From mean lifetime 390 fs *20* (1989Ge09).
2704	180 fs *76*	$T_{1/2}$: From mean lifetime 260 fs *110* (1989Ge09).
2981		
3679		
3853		
3916		
4430		
4778		
5374		
5538		
5740		
5760		
5934		
5968		
6042		

[†] As listed in 1972Ni05.
[‡] From mean lifetime measured by 1989Ge09.

γ(^{23}Na)

Average ratios of the measured γ-ray angular distribution at 150° and 110° in 2012Ro04 are listed in comments section.

E_i(level)	E_γ[†]	I_γ[‡]	E_f	Comments
441	441	100	0.0	W(150°)/W(110°)=0.99 *1* (2012Ro04).
2077	1636	92	441	W(150°)/W(110°)=1.05 *1* (2012Ro04).
	2077	8	0.0	
2392	1951	37	441	
	2392	63	0.0	W(150°)/W(110°)=1.00 *3* (2012Ro04).
2640	2640	100	0.0	W(150°)/W(110°)=0.95 *2* (2012Ro04).
2704	627	39	2077	
	2263	61	441	W(150°)/W(110°)=1.39 *43* (2012Ro04).
2981	2540	50	441	W(150°)/W(110°)=0.94 *5* (2012Ro04).
	2981	50	0.0	
3679	1039	10	2640	
	1602[#]	10	2077	E_γ: Absent in Adopted Gammas. Not reported in other work. Evaluators assign as uncertain placement.

Continued on next page (footnotes at end of table)

^{23}Na(n,n′γ) 1989Ge09,1972Ni05,2012Ro04 (continued)

γ(^{23}Na) (continued)

E_i(level)	E_γ[†]	I_γ[‡]	E_f	Comments
3679	3238	80	441	
3853	3412	50	441	
	3853	50	0.0	
3916	1839	20	2077	
	3475	20	441	
	3916	60	0.0	
4430	2038	8	2392	
	4430	92	0.0	
4778	1797[#]	15	2981	E_γ: Absent in Adopted Gammas. Not reported in other work. Evaluators assign as uncertain placement.
	2701	15	2077	
	4337	60	441	
	4777[#]	10	0.0	E_γ: g.s. branch not reported in other work. Evaluators assign as uncertain placement.
5374	5373	100	0.0	
5538	5537	100	0.0	
5740	5739	100	0.0	
5760	5759	100	0.0	
5934	5492	10	441	
	5933	90	0.0	
5968	5967	100	0.0	
6042	5600	100	441	

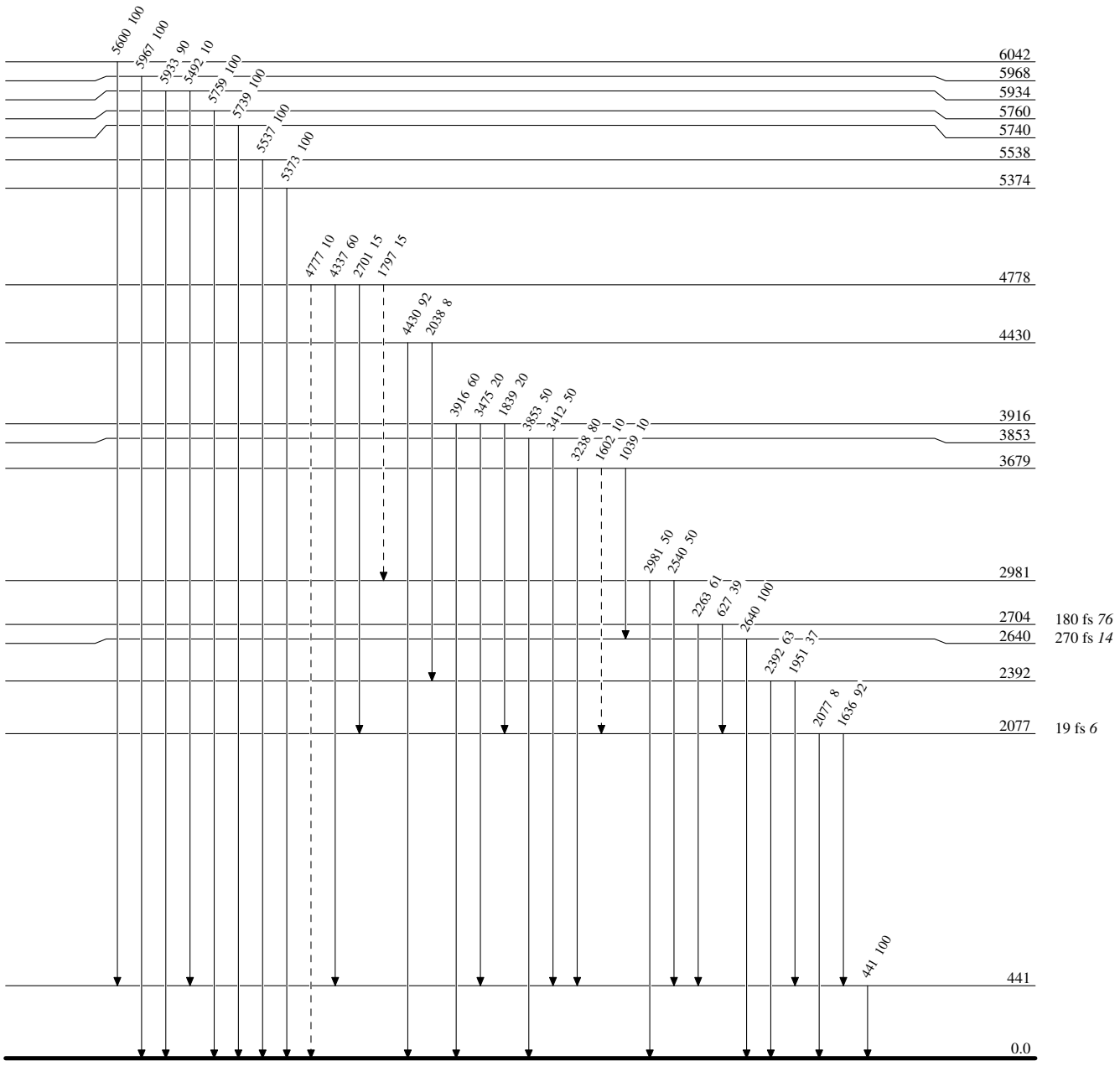
[†] From level energy differences, recoil energy subtracted and rounded to nearest keV.
[‡] From 1972Ni05.
[#] Placement of transition in the level scheme is uncertain.

^{23}Na(n,n′γ) 1989Ge09,1972Ni05,2012Ro04 Legend

Level Scheme

Intensities: % photon branching from each level

- - - - - - ► γ Decay (Uncertain)



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