

$^{23}\text{Na}(n,\gamma) E=53 \text{ keV}$  1998Pa44

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty		NDS 186, 2 (2022)	31-Mar-2022

1998Pa44: Neutrons were produced from the  $^7\text{Li}(p,n)^7\text{Be}$  reaction by bombarding a Li evaporated copper disk with a proton beam from the 3.2 MV Pelletron accelerator of the Research Laboratory for Nuclear Reactors in Tokyo Institute of Technology. The neutron capture sample had 99% sodium with a dimension of 8.9 cm diameter and 1 cm thickness which was made in a glove box of Argon gas atmosphere. The primary  $\gamma$ -rays from the 53 keV neutron capture state was detected with a high resolution and high efficiency (100% efficiency) HPGe detector. The detector was well shielded anti-Compton NaI(Tl) detector. Reported 24 primary gamma-rays from the capture state at 7010-keV.

Measured  $E_\gamma$ ,  $I_\gamma$ . No uncertainties were reported for  $E_\gamma$ .

Others: 2001Ho12, 1967Be36, 1960Hi06.

 $^{24}\text{Na}$  Levels

E(level) <sup>†</sup>	Comments
472.2071	E(level): From Adopted Levels. <a href="#">Additional information 1.</a>
563.9	
1341.0	
1344.2	
1346.2	
1846.2	
2514.1	
2904.1	
2978.0	
3374.2	
3414.0	
3590.1	
3629.3	
3656.9	
3896.1	
3934.8	
3944.1	
3977.9	
4525.9	
4562.2	
4693.9	
4938.8	
4980.8	
5060.2	
(7010.6)	E(level): 53 keV neutron capture state, obtained from least squares fitting. 7010.29 in 1998Pa44. The neutron binding energy of $^{24}\text{Na}$ was determined to be 6959.75 keV (1998Pa44). The assigned spin-parity of the level is $2^-$ in 2001Ho12. The derived value of the radiative width of the 53 keV resonance is 0.96 eV 10 in 2001Ho12.

<sup>†</sup> From a least square fitting assuming  $\Delta E_\gamma=1 \text{ keV}$ .

 $\gamma(^{24}\text{Na})$ 

$E_i(\text{level})$	$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>†</sup>	$E_f$
(7010.6)	1950.24	0.45 8	5060.2
	2029.64	0.07 3	4980.8
	2071.72	0.22 6	4938.8
	2316.57	1.99 17	4693.9
	2448.20	3.72 24	4562.2

Continued on next page (footnotes at end of table)

$^{23}\text{Na}(n,\gamma) E=53 \text{ keV}$  **1998Pa44** (continued) $\gamma(^{24}\text{Na})$  (continued)

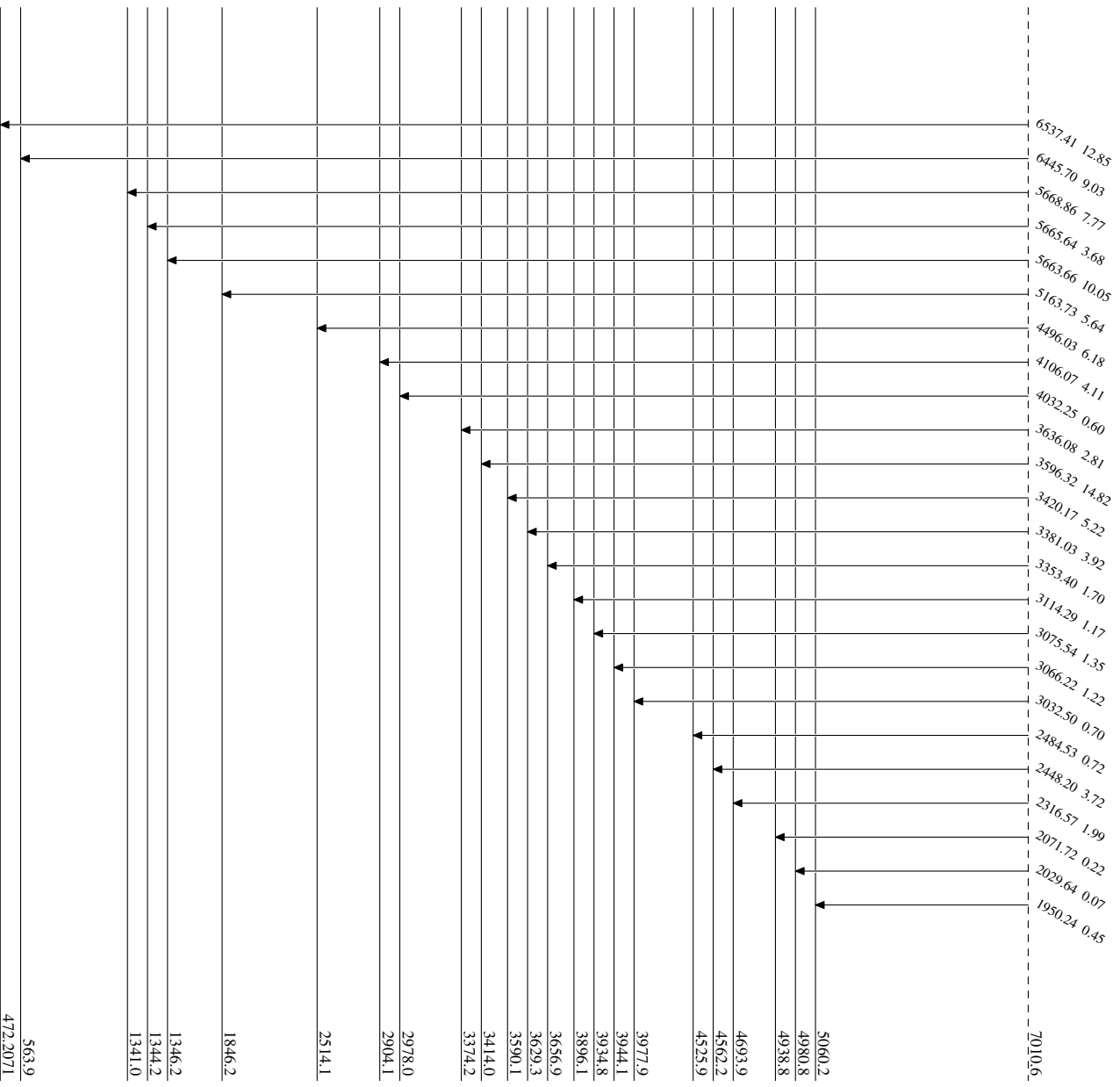
$E_i(\text{level})$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$E_i(\text{level})$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$
(7010.6)	2484.53	0.72 11	4525.9	(7010.6)	4032.25	0.60 11	2978.0
	3032.50	0.70 11	3977.9		4106.07	4.11 30	2904.1
	3066.22	1.22 15	3944.1		4496.03	6.18 38	2514.1
	3075.54	1.35 15	3934.8		5163.73	5.64 39	1846.2
	3114.29	1.17 14	3896.1		5663.66	10.05 54	1346.2
	3353.40	1.70 18	3656.9		5665.64	3.68 33	1344.2
	3381.03	3.92 27	3629.3		5668.86	7.77 47	1341.0
	3420.17	5.22 31	3590.1		6445.70	9.03 54	563.9
	3596.32	14.82 54	3414.0		6537.41	12.85 65	472.2071
	3636.08	2.81 24	3374.2				

<sup>†</sup> From [1998Pa44](#). The transition intensities from [1998Pa44](#) are in good agreement with those reported in [2001Ho12](#), except for 3636, 3075, and 1950 keV transitions.

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## Level Scheme

Intensities: % photon branching from each level

 $^{24}\text{Na}_{13}$