^{32}S(^{14}N,pnγ),^{42}Ca(α,2nγ) 1975Si19,1976Br15

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 190,1 (2023)	20-Jun-2023

1975Si19: ^{32}S(^{14}N,pnγ) E=26-43 MeV ^{14}N beam produced from the tandem accelerators at the Max-Planck-Institute at Heidelberg and McMaster University. A 1.5 mg/cm^2 target of natural CdS on a bismuth backing. Large volume high resolution (2keV) Ge(Li) detectors for detecting γ-rays. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$. Deduced levels, J^π, $T_{1/2}$ using Doppler Shift Attenuation Method (DSAM).

1976Br15: ^{42}Ca(α,2nγ) E=31 MeV alpha beam produced from the cyclotron of the Institut des Sciences Nucleaires in Grenoble. A target of 5 mg/cm^2 rolled metallic calcium foil (90% enriched in ^{42}Ca) on a 7 μm mylar film. Two Ge(Li) detectors of 10 and 50 cm^3 with FWHM=2.5 and 3.5 keV, respectively for 1.33 MeV γ-rays. Measured Eγ, $\gamma\gamma$-coin. Deduced lifetime of 8038 level using DSAM.

Level scheme is from 1975Si19.

^{44}Ti Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
0.0[@]	0$^+$		
1082.9[@] *1*	2$^+$		
2454.2[@] *5*	4$^+$		
3176.3 *6*	(3$^-$)		
3645.9 *6*	(4$^-$)		
4014.9[@] *6*	6$^+$		
4061.1 *6*	(5$^-$)		
6507.6[@] *15*	(8$^+$)	<0.5 ps	
7670.4[@] *16*	(10$^+$)	1.87 ps *35*	
8039.3[@] *16*	(12$^+$)	2.1 ns *4*	T$_{1/2}$: from pulsed-beam (1976Br15).

[†] From a least-squares fit to γ-ray energies.
[‡] As proposed in 1975Si19 based on band assignments and $\gamma(\theta)$.
[#] From DSAM in 1975Si19, unless otherwise noted.
[@] Band(A): Yrast g.s. band (1975Si19).

γ(^{44}Ti)

E$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]	Comments
368.9 *1*	8039.3	(12$^+$)	7670.4	(10$^+$)	Q	A$_2$=+0.22 *11*; A$_4$=+0.02 *14* (1975Si19)
469.6 *1*	3645.9	(4$^-$)	3176.3	(3$^-$)	(D)	A$_2$=−0.12 *2*; A$_4$=+0.07 *3* (1975Si19) Mult.: $\gamma(\theta)$ data also consistent with a large δ(Q/D) (1975Si19).
884.7 *3*	4061.1	(5$^-$)	3176.3	(3$^-$)		
1082.9[‡] *1*	1082.9	2$^+$	0.0	0$^+$	Q	A$_2$=+0.16 *4*; A$_4$=−0.07 *4* (1975Si19)
1162.8 *3*	7670.4	(10$^+$)	6507.6	(8$^+$)	Q	A$_2$=+0.54 *13*; A$_4$=−0.41 *17* (1975Si19)
1371.4 *5*	2454.2	4$^+$	1082.9	2$^+$		
1560.7 *4*	4014.9	6$^+$	2454.2	4$^+$		
1607.0 *5*	4061.1	(5$^-$)	2454.2	4$^+$		
2092.9[‡] *8*	3176.3	(3$^-$)	1082.9	2$^+$	D	A$_2$=−0.15 *2*; A$_4$=−0.03 *4* (1975Si19)
2492.6 *14*	6507.6	(8$^+$)	4014.9	6$^+$		

[†] From 1975Si19.
[‡] Used for calibration in 1975Si19.
[#] From $\gamma(\theta)$ in 1975Si19. The authors also assign magnetic or electric characters based on level scheme, which are replaced with D for dipole and Q for quadrupole by the evaluators due to no experimental evidence for those assignments in this work.

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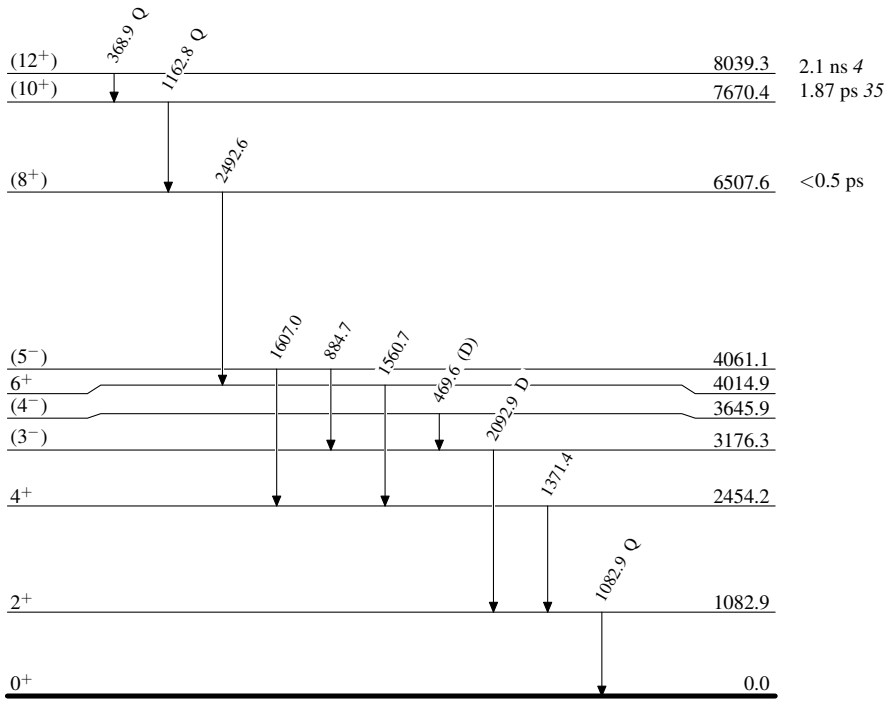
Level Scheme



$^{44}_{22}Ti_{22}$

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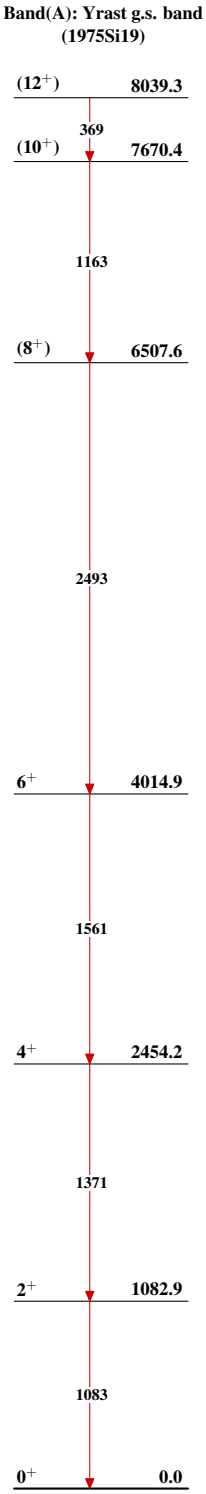

$^{44}_{22}Ti_{22}$