Be(^{31}Na,^{30}Naγ) 2015Pe09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

Adapted/Edited the XUNDL dataset compiled by J. Chen (NSCL, MSU), July 17, 2015.
One-neutron knockout reaction.
2015Pe09: ^{31}Na secondary beam, E=94 MeV/nucleon, was produced by fragmentation of ^{48}Ca primary beam, E=140 MeV/nucleon, at NSCL, bombarding a ^{9}Be target, thickness 888 mg/cm^2. The secondary target was also ^{9}Be, thickness 376 mg/cm^2. Fragments were separated by the A1900 separator. γ rays were detected with the SeGA array comprised of sixteen *32*-fold segmented HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, ^{30}Na-γ-coin. Deduced levels, J, π, band structures, configurations.

^{30}Na Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0[#]	(2$^+$)		
151.0[@] *10*	(1$^+$)	≈347 ps	T$_{1/2}$: from τ≈500 ps, estimated in 2015Pe09 from low-energy tail of 151γ in the γ spectra.
338.0[&] *15*			
424.0[#] *20*	(3$^+$)		
510.0[&] *25*			
516.0[@] *23*	(2$^+$)		
758[&] *4*			
925[#] *3*	(4$^+$)		
1032[@] *3*			
1263[@] *4*			
1527[&] *5*			

[†] From a least-squares fit to γ-ray energies.
[‡] Tentative assignments in 2015Pe09 based on band structure.
[#] Band(A): K^π=(2$^+$), 2p2h, g.s. band. Population intensity=29% *7*.
[@] Band(B): K^π=(1$^+$), 2p2h band. Population intensity=30% *5*.
[&] Band(C): 1p1h/3p3h, π=− band. Population intensity=42% *6*.

γ(^{30}Na)

E$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
151 *1*	151.0	(1$^+$)	0	(2$^+$)	E$_\gamma$: listed in 2015Pe09 from 2007Tr08. The measured value is 148 keV in 2015Pe09. The Eγ shift is attributed to the longer mean lifetime (τ≈500 ps) of this state by the authors of 2015Pe09.
172[‡] *2*	510.0		338.0		
187[‡] *2*	338.0		151.0	(1$^+$)	
248[‡] *2*	758		510.0		
338[‡] *2*	338.0		0	(2$^+$)	
365 *2*	516.0	(2$^+$)	151.0	(1$^+$)	
424 *2*	424.0	(3$^+$)	0	(2$^+$)	
501[#] *2*	925	(4$^+$)	424.0	(3$^+$)	
516[‡#] *2*	1032		516.0	(2$^+$)	
747[‡#] *3*	1263		516.0	(2$^+$)	
769[‡#] *3*	1527		758		

Continued on next page (footnotes at end of table)

Be(^{31}Na,^{30}Naγ) 2015Pe09 (continued)

$\gamma(^{30}Na)$ (continued)

† From 2015Pe09.
‡ New transition (2015Pe09).
# The γ identified in singles spectrum, not in $\gamma\gamma$-coin spectrum due to poor statistics. The placement in the level scheme is firm based on the one-proton knockout reaction.

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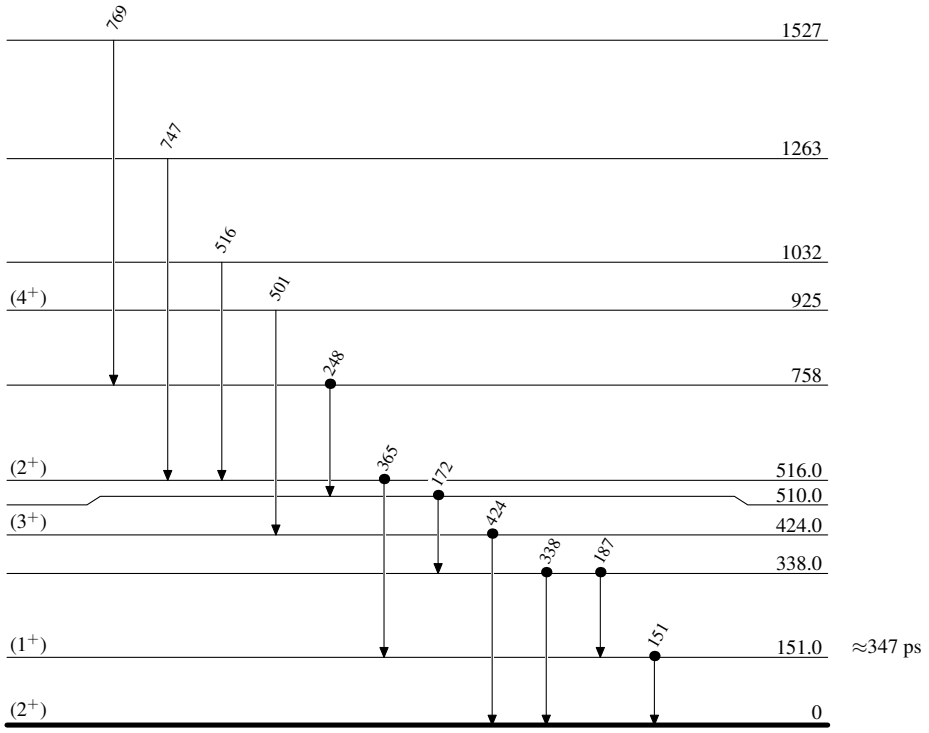
Level Scheme



$^{30}_{11}Na_{19}$

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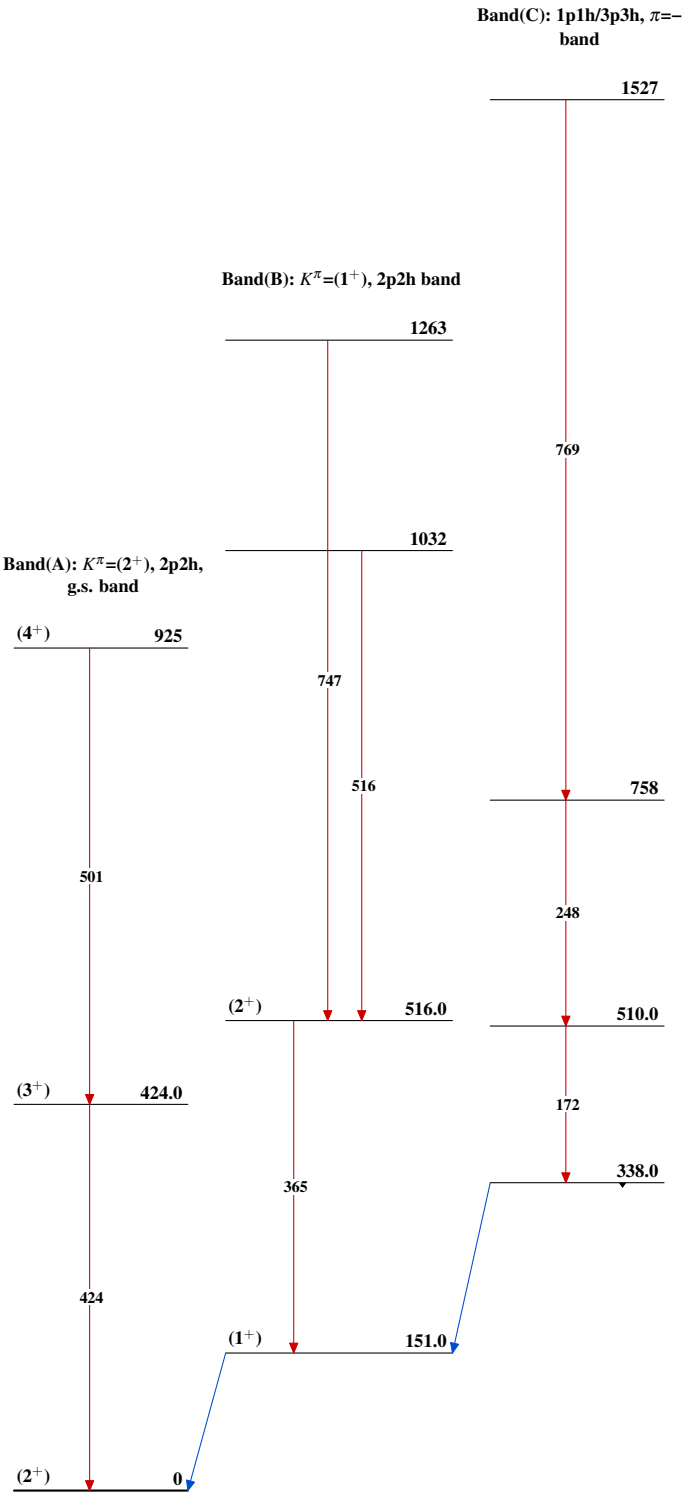

$^{30}_{11}Na_{19}$