^{70}Zn(^{7}Li,3npγ) 2015Su12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 158, 1 (2019)	16-May-2019

2015Su12: E=30 and 35 MeV ^{7}Li beams were produced from the tandem facility of the China Institute of Atomic Energy (CIAE). Targets were 2.15 mg/cm^2 ^{70}Zn on a 0.93 mg/cm^2 Au backing in the first run with E=30 MeV, and 3.48 mg/cm^2 ^{70}Zn on a 15.75 mg/cm^2 Pb backing in the second run with E=35 MeV. γ rays were detected by an array of 12 HPGe detectors with BGO anti-Compton suppressors and two planar HPGe detectors. Measured Eγ, Iγ, γγ-coin, γ(DCO). Deduced levels, J, π, γ-ray branching ratios, band structures. Comparisons with shell-model calculations. Systematics of neighboring nuclei.

^{73}Ge Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0&	9/2+	499.1 7	7/2+	1609.7 5	(9/2+)	3006.5 7	(17/2−)
13.3 7	5/2+	741.5@ 5	7/2(−)	1870.4& 7	17/2(+)	3179.9& 8	21/2(+)
66.7 9	1/2−	825.4& 4	13/2(+)	1931.0a 5	15/2(+)	3199.2a 7	(19/2+)
68.7a 4	7/2+	868.1a 4	11/2(+)	2003.4# 7	13/2(−)	3221.7@ 9	19/2(−)
353.8# 5	(5/2)−	1010.1 11	(5/2+)	2359.7@ 7	15/2(−)	3875.2# 8	(21/2−)
363.7@ 7	3/2−	1130.0# 6	9/2(−)	2760.0 7		4608.2 10	(25/2+)
392.5 10	3/2−	1525.0@ 6	11/2(−)	2814.7# 7	17/2(−)		

† From a least-squares fit to γ-ray energies, ΔEγ=0.5 keV assumed by the evaluators for fitting purpose only.

‡ From 2015Su12 for levels above 499 level based on band structures, γ(DCO) and known assignments for low-lying states (up to 499 level) from Adopted Levels, unless otherwise noted. Brackets around parities (above 499 level) are added by the evaluators considering there is no direct experimental evidence for parity determination in 2015Su12.

Band(A): $\nu f_{5/2}$ band,α=+1/2.

@ Band(a): $\nu f_{5/2}$ band,α=−1/2.

& Band(B): $\nu g_{9/2}$ band,α=+1/2.

a Band(b): $\nu g_{9/2}$ band,α=−1/2.

γ(^{73}Ge)

Eγ†	Iγ†	Ei(level)	Jiπ	Ef	Jfπ	Mult.‡	Comments
68.7		68.7	7/2+	0.0	9/2+		
285.1	81.4 13	353.8	(5/2)−	68.7	7/2+	(D)	DCO=0.83 5
297.0	10.5 5	363.7	3/2−	66.7	1/2−	(D)	DCO=0.76 10
325.8		392.5	3/2−	66.7	1/2−		
340.5	8.1 4	353.8	(5/2)−	13.3	5/2+		
377.8	7.3 4	741.5	7/2(−)	363.7	3/2−	Q	DCO=1.01 12
387.7	24.8 6	741.5	7/2(−)	353.8	(5/2)−	(D)	DCO=0.88 7
395.0	1.9 2	1525.0	11/2(−)	1130.0	9/2(−)		
430.4		499.1	7/2+	68.7	7/2+		
455.0	4.6 3	2814.7	17/2(−)	2359.7	15/2(−)		
478.4	2.8 3	2003.4	13/2(−)	1525.0	11/2(−)		
617.6		1010.1	(5/2+)	392.5	3/2−		
646.8	<1	3006.5	(17/2−)	2359.7	15/2(−)		
741.5	9.9 5	741.5	7/2(−)	0.0	9/2+	D	DCO=0.53 9
741.6	9.5 7	1609.7	(9/2+)	868.1	11/2(+)		
776.2	35.3 9	1130.0	9/2(−)	353.8	(5/2)−	Q	DCO=1.06 8
783.5	27.5 8	1525.0	11/2(−)	741.5	7/2(−)	Q	DCO=0.90 7
784.3	7.2 4	1609.7	(9/2+)	825.4	13/2(+)		

Continued on next page (footnotes at end of table)

^{70}Zn(^{7}Li,3npγ) 2015Su12 (continued)

$\gamma(^{73}Ge)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
799.4	18.1 *11*	868.1	$11/2^{(+)}$	68.7	$7/2^+$	Q	DCO=1.17 *18*
811.3	13.4 *6*	2814.7	$17/2^{(-)}$	2003.4	$13/2^{(-)}$	Q	DCO=1.05 *13*
825.4	122 *7*	825.4	$13/2^{(+)}$	0.0	$9/2^+$	Q	DCO=1.21 *9*
834.7	23.4 *7*	2359.7	$15/2^{(-)}$	1525.0	$11/2^{(-)}$	Q	DCO=0.95 *7*
862.0	6.6 *3*	3221.7	$19/2^{(-)}$	2359.7	$15/2^{(-)}$	Q	DCO=1.03 *11*
868.1	29.0 *15*	868.1	$11/2^{(+)}$	0.0	$9/2^+$	D	DCO=0.54 *7*
868.7	<1	3875.2	$(21/2^-)$	3006.5	$(17/2^-)$		
873.4	32.4 *10*	2003.4	$13/2^{(-)}$	1130.0	$9/2^{(-)}$	Q	DCO=1.28 *11*
1003.1	<1	3006.5	$(17/2^-)$	2003.4	$13/2^{(-)}$		
1045.0	100	1870.4	$17/2^{(+)}$	825.4	$13/2^{(+)}$	Q	DCO=1.19 *7*
1060.5	<1	3875.2	$(21/2^-)$	2814.7	$17/2^{(-)}$	#	
1062.9	24.0 *8*	1931.0	$15/2^{(+)}$	868.1	$11/2^{(+)}$	Q	DCO=0.87 *16*
1105.6	9.6 *7*	1931.0	$15/2^{(+)}$	825.4	$13/2^{(+)}$	D	DCO=0.60 *11*
1150.3	<1	2760.0		1609.7	$(9/2^+)$		
1268.2	4.7 *3*	3199.2	$(19/2^+)$	1931.0	$15/2^{(+)}$	#	
1309.5	24.9 *12*	3179.9	$21/2^{(+)}$	1870.4	$17/2^{(+)}$	Q	DCO=1.05 *11*
1428.3	<1	4608.2	$(25/2^+)$	3179.9	$21/2^{(+)}$	#	

[†] From 2015Su12. Uncertainties of γ-ray energies are not given in 2015Su12; ΔE=0.5 keV is assumed by the evaluators for fitting purpose only.

[‡] From 2015Su12, deduced from measured γ(DCO).

[#] Assumed to be stretched E2 (2015Su12).

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Level Scheme

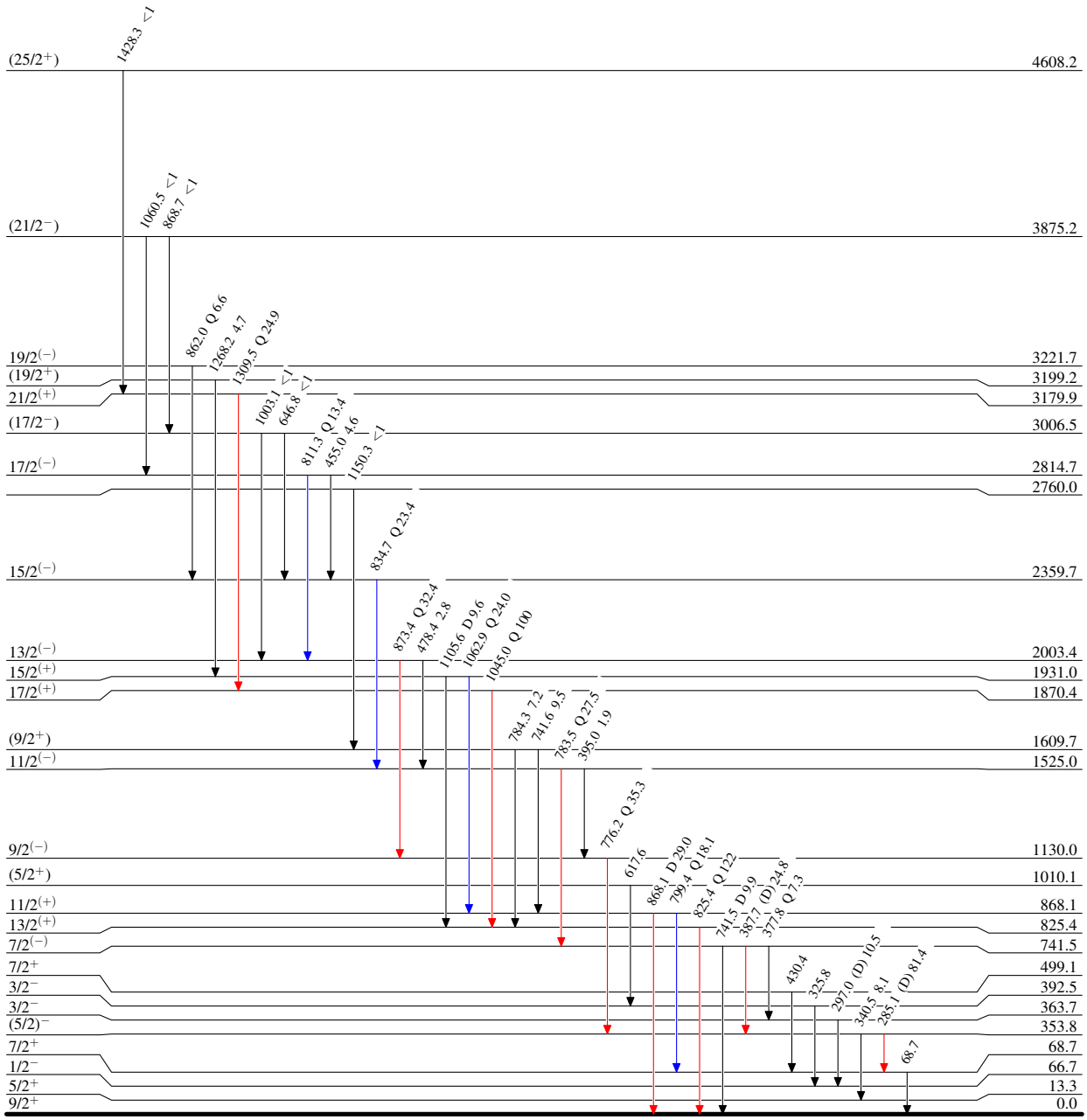
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{73}_{32}Ge_{41}$

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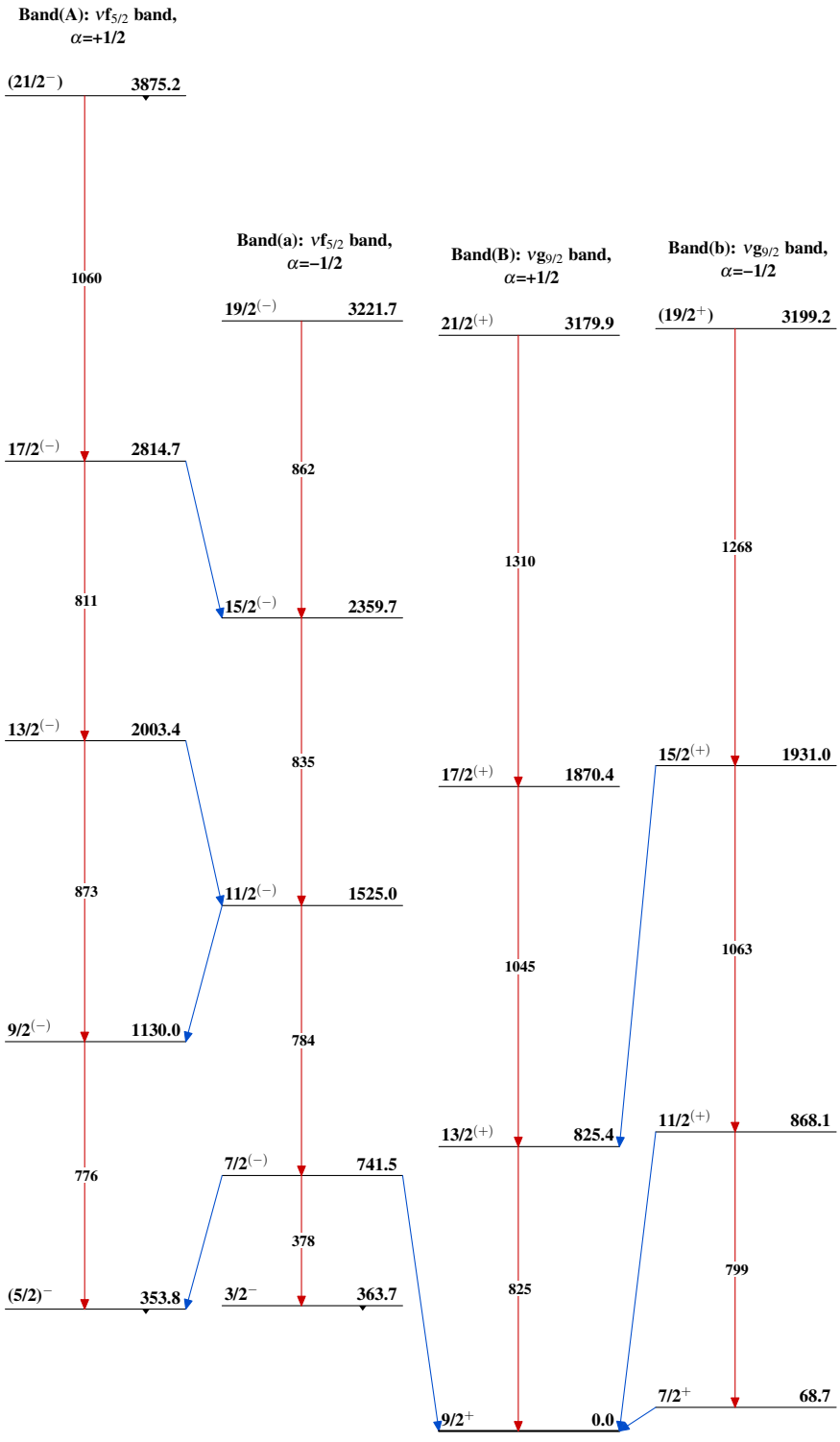

$^{73}_{32}Ge_{41}$