^{58}Ni(^{6}Li,pnγ) 1981Wa09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alan L. Nichols, Balraj Singh, Jagdish K. Tuli	NDS 113, 973 (2012)	15-Apr-2012

1981Wa09: E=15-24 MeV, measured Eγ, Iγ, $\gamma\gamma$, nγ coin., excitation functions, $\gamma(\theta)$, γ(linear polarization), lifetimes by DSAM and RDM. Comparisons made with the shell and IBA models.

^{62}Zn Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0.0	0$^+$		
953.7 *3*	2$^+$	2.91[@] ps *21*	
1804.7 *3*	2$^+$	2.63[@] ps *42*	
2185.8 *4*	4$^+$	0.53[#] ps *+24−14*	
2384.2 *4*	3$^+$	1.7 ps *11*	T$_{1/2}$: <2.8 ps from RDM; >0.7 ps from DSAM.
2743.2 *4*	4$^+$	2.36[@] ps *21*	J$^\pi$: 2$^+$,3$^-$ or 4$^+$ from $\gamma(\theta)$ and γ(lin pol); 4$^+$ from RUL.
3208.9 *13*			
3586.1 *6*	5$^+$	0.63[#] ps *+63−21*	J$^\pi$: possible 3 or 5 from $\gamma(\theta)$; >4 from excitation function.
3706.7 *5*	6$^+$	0.25[#] ps *+17−7*	J$^\pi$,T$_{1/2}$: from nγ coin. spectra.
4042.3 *8*	5	0.69[#] ps *+14−49*	J$^\pi$: 3 or 5 from $\gamma(\theta)$ and γ(lin pol); 5 from excitation function. Possibly the first 5$^-$ from systematics of even-A Zn nuclei.
4347.0 *5*	6$^+$	0.28[#] ps *+28−14*	J$^\pi$: 4 or 6 from $\gamma(\theta)$; excitation function supports 6$^+$; transition strength arguments (RUL) exclude negative parity.
4903.6 *7*	7$^{(-)}$	8.3[@] ps *35*	J$^\pi$: 5 or 7 from $\gamma(\theta)$ and γ(lin pol); excitation function supports 7.
5122.5 *8*	5,7	2.1 ps *14*	J$^\pi$: 3,5 or 7 from $\gamma(\theta)$ and γ(lin pol); yrast population disfavors 3; transition strength arguments (RUL) restrict the parity to be the same as that for 4042 level. T$_{1/2}$: <3.5 ps from RDM; >0.7 ps from DSAM for 5122 and 5130 levels.
5130.1 *8*	(6)	>0.7 ps	T$_{1/2}$: from DSAM for 5122+5130 levels. J$^\pi$: from excitation function.
5142.8 *9*	6$^+$,7$^+$	0.42[#] ps *+21−14*	J$^\pi$: 6 or 7 from excitation function; parity from $\gamma(\theta)$ and γ(lin pol).
5481.82 *13*	6,7,8$^+$	0.28[#] ps *+14−7*	J$^\pi$: from $\gamma(\theta)$, γ(lin pol), and excitation function. J^π=(8$^+$) in Adopted Levels.
6080.5 *9*	7$^{(-)}$,9$^{(-)}$	3.8 ps *32*	J$^\pi$: 5,7 or 9 from $\gamma(\theta)$ and γ(lin pol) with same parity as that of the 4904 level; 5 rejected by excitation function. T$_{1/2}$: <7 ps from RDM, >0.7 ps from DSA.
6112.3 *10*			
6628.5 *22*			
7422.4 *12*			

[†] From least-squares fit to Eγ data.
[‡] As proposed in 1981Wa09 based on their $\gamma(\theta)$, γ(lin pol), and lifetime measurements.
[#] From DSAM.
[@] From RDM.

γ(^{62}Zn)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[b]	δ[c]	Comments
359.1 *2*	1.45 *8*	2743.2	4$^+$	2384.2	3$^+$	M1+E2	−0.9 *+4−6*	A$_2$=−0.39 *4*, A$_4$=+0.02 *5*, pol=+0.2 *3*.
556.9 *5*	2.9[&] *7*	4903.6	7$^{(-)}$	4347.0	6$^+$			Additional information 7.
557.3 *5*	13[&] *3*	2743.2	4$^+$	2185.8	4$^+$	M1+E2	−0.35 *3*	Additional information 3. A$_2$=+0.14 *2*, A$_4$=−0.04 *3*, pol=+0.63 *7*.
580.0 *5*	8.6 *6*	2384.2	3$^+$	1804.7	2$^+$	M1+E2	−1.1 *7*	δ: −0.6 to −1.7.

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^{58}Ni(^{6}Li,pnγ) 1981Wa09 (continued)

γ(^{62}Zn) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	δ[c]	Comments
								A_2=−0.37 *2*, A_4=+0.08 *3*, pol=+0.25 *7*. Additional information 2.
640.3 *2*	0.53 *5*	4347.0	6+	3706.7	6+			Additional information 6.
833.4 *10*	2.0[#] *3*	4042.3	5	3208.9				Additional information 5.
842.7 *5*	5.6 *3*	3586.1	5+	2743.2	4+	M1+E2	−2.17 *+84−5*	A_2=−0.44 *3*, A_4=+0.07 *3*, pol=+0.08 *10*.
850.6 *5*	13.0 *7*	1804.7	2+	953.7	2+	M1+E2	−5.1 *+29−34*	A_2=−0.17 *2*, A_4=−0.03 *3*, pol=−0.03 *8*.
938.2 *5*	9.2 *3*	2743.2	4+	1804.7	2+	E2		Mult.: δ(M3/E2)=−0.13 *+11−5*. A_2=+0.14 *3*, A_4=−0.05 *3*, pol=+0.4 *1*.
953.5[‡] *3*	100	953.7	2+	0.0	0+	E2		A_2=+0.19 *2*, A_4=−0.06 *3*, pol=+0.37 *7*.
1024.0 *10*	2.3[a] *10*	3208.9		2185.8	4+			
1080.2 *3*	2.8[@] *1*	5122.5	5,7	4042.3	5	M1+E2,E2		Mult.: from $\gamma(\theta)$ and RUL. Mult.: δ(E2/M1)=−0.31 *4* for 5 to 5. δ(M3/E2)=−0.05 *+4−3* for 7 to 5. A_2=+0.28 *3*, A_4=−0.12 *3*, pol=+0.7 *3*.
1087.8 *3*	1.27[@] *6*	5130.1	(6)	4042.3	5	D+Q	−4.7 *26*	δ: −4.8 *+26−25* for transition between opposite parity states; −4.3 *+22−30* if the parities are the same. A_2=−0.25 *5*, A_4=+0.12 *5*, pol=−0.1 *6*.
1176.9 *6*	4.7[@] *3*	6080.5	7(−),9(−)	4903.6	7(−)	M1+E2		Mult.: from $\gamma(\theta)$ and RUL. Mult.: δ(E2/M1)=−0.41 *+17−6* for 7 to 7. δ(M3/E2)=−0.07 *+22−6* for 9 to 7. A_2=−0.16 *3*, A_4=−0.03 *3*, pol=+0.7 *2*.
1196.6 *6*	4.6[@] *2*	4903.6	7(−)	3706.7	6+			δ: −1.8 *+16−18* for 7+ to 6+; +0.02 *+2−5* for 7− to 6+. A_2=−0.26 *3*, A_4=+0.01 *3*, pol=+0.8 *3*.
1202.2 *6*	4.5 *2*	3586.1	5+	2384.2	3+	E2		A_2=+0.20 *3*, A_4=−0.08 *3*, pol=+0.7 *3*. Additional information 4.
1208.7 *7*		6112.3		4903.6	7(−)			
1231.9[‡] *3*	57.1 *23*	2185.8	4+	953.7	2+	E2		Mult.: δ(M3/E2)=−0.02 *+5−3*. A_2=+0.29 *2*, A_4=−0.10 *3*, pol=+0.5 *1*.
1299.3 *12*	3.5[#] *4*	4042.3	5	2743.2	4+			
1341.9 *8*		7422.4		6080.5	7(−),9(−)			
1430.6 *8*	11.8[#] *6*	2384.2	3+	953.7	2+			
1506.0 *20*		6628.5		5122.5	5,7			
1520.7 *4*	17.8 *8*	3706.7	6+	2185.8	4+	E2		Mult.: δ(M3/E2)=−0.03 *4*. A_2=+0.36 *4*, A_4=−0.19 *5*, pol=+0.6 *2*.

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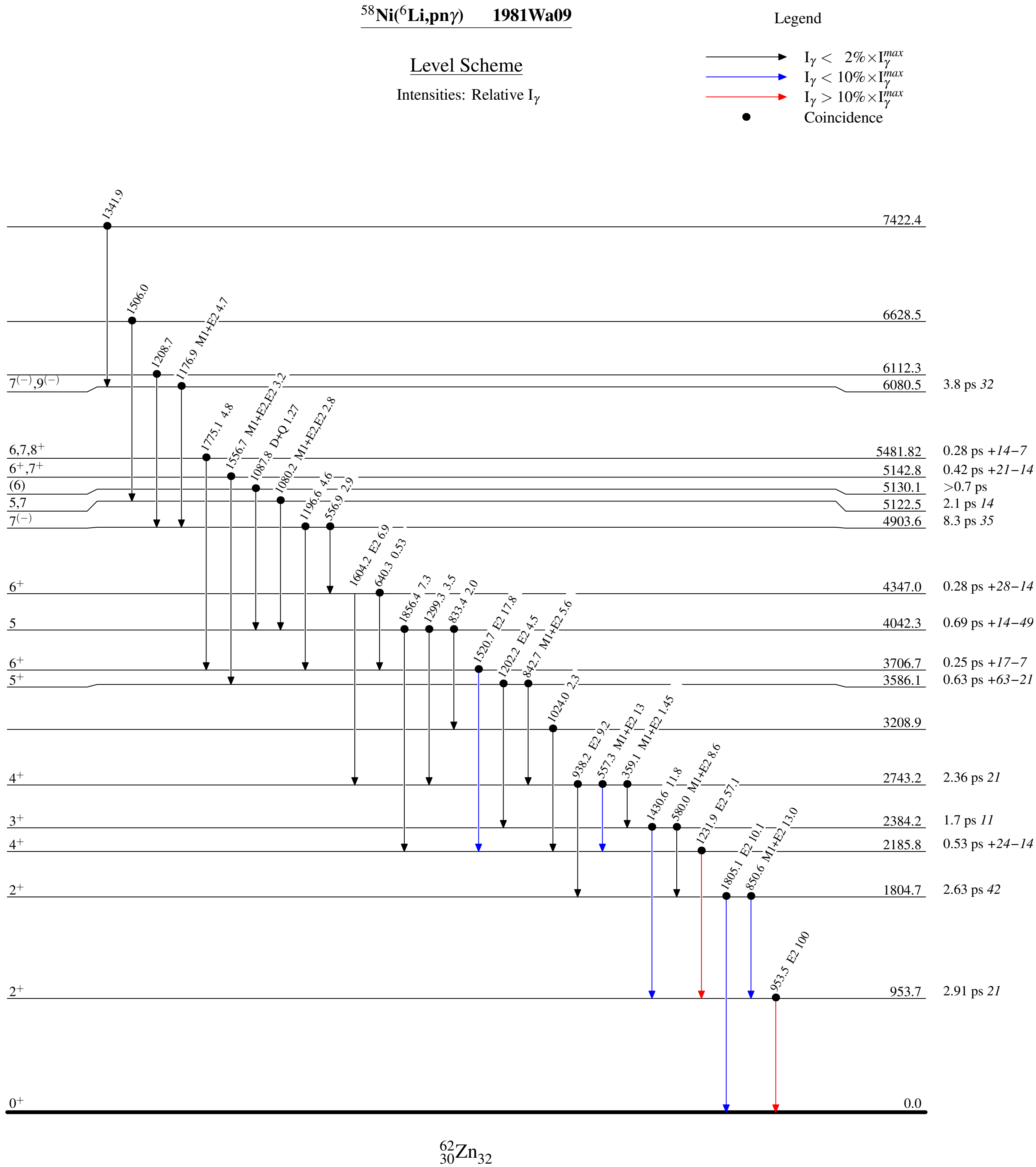
^{58}Ni(^{6}Li,pnγ) 1981Wa09 (continued)

γ(^{62}Zn) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	Comments
1556.7 *7*	3.2[@] *2*	5142.8	$6^+,7^+$	3586.1	5^+	M1+E2,E2	Mult.: δ(E2/M1)=+2.8 *+41−23* for 6 to 5. δ(M3/E2)=+0.5 *+101−6* for 7 to 5. A_2=+0.16 *3*, A_4=+0.04 *3*, pol=+0.3 *3*.
1604.2 *7*	6.9 *4*	4347.0	6^+	2743.2	4^+	E2	Mult.: δ(M3/E2)=−0.08 *6*. A_2=+0.29 *4*, A_4=−0.20 *5*.
1775.1 *12*	4.8[#] *3*	5481.82	$6,7,8^+$	3706.7	6^+		
1805.1[‡] *4*	10.1 *5*	1804.7	2^+	0.0	0^+	E2	A_2=+0.18 *3*, A_4=−0.08 *3*, pol=+0.7 *2*. Additional information 1.
1856.4 *8*	7.3[@] *4*	4042.3	5	2185.8	4^+		δ: −2.5 *+20−17* for 5^+ to 4^+; +0.02 *+2−4* for 5^- to 4^+. A_2=−0.30 *3*, A_4=+0.04 *4*, pol=+0.95 *28*.

[†] From $\gamma(\theta)$ at 20 MeV, unless stated otherwise.
[‡] Value taken from 1979-NDS (1979Ha01) and used for calibration.
[#] From n$\gamma(\theta)$.
[@] From $\gamma(\theta)$ at 24 MeV.
[&] From $\gamma\gamma$ coin. data at 20 MeV.
[a] From $\gamma\gamma$ coin. data at 24 MeV.
[b] From $\gamma(\theta)$ and γ(linear polarization) combined with RUL when applicable.
[c] From minimization of $\gamma(\theta)$ and γ(linear polarization) data.


^{58}Ni(^{6}Li,pnγ) 1981Wa09
Level Scheme
Intensities: Relative Iγ
Legend
Iγ < 2%×Iγ^max
Iγ < 10%×Iγ^max
Iγ > 10%×Iγ^max
Coincidence
7422.4
6628.5
6112.3
7(−),9(−) 6080.5 3.8 ps 32
6,7,8+ 5481.82 0.28 ps +14−7
6+,7+ 5142.8 0.42 ps +21−14
(6) 5130.1 >0.7 ps
5,7 5122.5 2.1 ps 14
7(−) 4903.6 8.3 ps 35
6+ 4347.0 0.28 ps +28−14
5 4042.3 0.69 ps +14−49
6+ 3706.7 0.25 ps +17−7
5+ 3586.1 0.63 ps +63−21
3208.9
4+ 2743.2 2.36 ps 21
3+ 2384.2 1.7 ps 11
4+ 2185.8 0.53 ps +24−14
2+ 1804.7 2.63 ps 42
2+ 953.7 2.91 ps 21
0+ 0.0
1341.9
1506.0
1208.7
1176.9 M1+E2 4.7
1775.1 4.8
1556.7 M1+E2,E2 3.2
1087.8 D+Q 1.27
1080.2 M1+E2,E2 2.8
1196.6 4.6
556.9 2.9
1604.2 E2 6.9
640.3 0.53
1856.4 7.3
1299.3 3.5
833.4 2.0
1520.7 E2 17.8
1202.2 E2 4.5
842.7 M1+E2 5.6
1024.0 2.3
938.2 E2 9.2
557.3 M1+E2 13
359.1 M1+E2 1.45
1430.6 11.8
580.0 M1+E2 8.6
1231.9 E2 57.1
1805.1 E2 10.1
850.6 M1+E2 13.0
953.5 E2 100
$^{62}_{30}Zn_{32}$