^{62}Ni(n,n′γ) 2011Ch05,1989Ko54

History

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

2011Ch05: E(n)=2.8-4.1 MeV in 100-keV steps. Measured Eγ, Iγ, γ(θ), excitation functions, lifetimes by DSAM. Comparison with large-scale shell-model calculations. Deduced B(E2) and B(M1) strengths.
1989Ko54, 1985KoZM,: E=fast (1-6 MeV) neutrons from reactor, measured Eγ, γ(θ), lifetimes by DSA; deduced B(E2), B(M1).
Others:
1982Sh28: E=14.2 MeV.
1978KoZY: Ni(n,n′γ) E=14 MeV measured σ(first 2^+).
All data adopted from 2011Ch05, unless stated otherwise. Limited data are given in other studies (1989Ko54,1985KoZM) for 1173, 2301, 2336, 3058, 3158, 3277, 3519, 3757 and 4018 levels.

^{62}Ni Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
1172.97 *11*	2^+	1.24 ps *+60−33*	
2048.67 *13*	0^+	1.8 ps *+19−6*	
2301.82 *14*	2^+	0.67 ps *+20−14*	$T_{1/2}$: other: 0.35 ps *+55−14* (1989Ko54).
2336.54 *15*	4^+	0.85 ps *+41−22*	$T_{1/2}$: other: 0.3 ps *+11−1* (1989Ko54).
2890.5 *3*	0^+	>3.1[@] ps	
3058.74 *17*	3^+	2.3[@] ps *+14−7*	Jπ: from γ(θ) data. $J^\pi=2^+$ is inconsistent with γ(θ) for 722γ and 757γ. The g.s. transition was not observed in 2011Ch05, with an detection limit of <2% branching ratio.
3157.90 *17*	2^+	0.62 ps *+11−10*	$T_{1/2}$: other: 0.083 ps *+21−14* (1989Ko54).
3176.7 *3*	4^+	>0.97 ps	
3257.51 *22*	2^+	>0.97 ps	
3269.95 *21*	$(1^+,2^+)$	0.125 ps *14*	When feeding from the 1221 doublet transition is considered, measured branching ratios are 4.8 *2* for 968γ, 38.9 *10* for 1221γ, 44.7 *13* for 2097γ and 11.6 *14* for 3270γ.
3277.5 *4*	4^+	0.42 ps *+7−6*	$T_{1/2}$: other: 0.4 ps *+13−5* (1989Ko54).
3369.67 *23*	1^+	0.35 ps *+8−6*	
3518.27 *23*	2^+	0.62 ps *+12−10*	$T_{1/2}$: other: 0.097 ps *+21−14* (1989Ko54).
3522.51 *19*	(3^+)	0.61 ps *+30−17*	Without including the intensity of the weak 265γ and considering feeding from the 1221 doublet transition, the measured branching ratios are 4.6 *3* for 463γ, 24.8 *6* for 1186γ and 70.7 *16* for 1221γ.
3524.4 *5*	0^+	0.74 ps *+46−22*	
3756.5 *3*	3^-	0.17 ps *+8−5*	$T_{1/2}$: other: 0.45 ps *+45−17* (1989Ko54).
4018	6^+		E(level),Jπ: level population from 1985KoZM. According to 1985KoZM, there is another γ deexciting the 3757 level, but no Eγ is listed.

[†] From least-squares fit to Eγ data. There are small differences in level energies as compared with those in 2011Ch05.
[‡] From 2011Ch05 based on γ(θ) and lifetime data, together with previous assignments for the low-lying levels.
[#] From DSAM (2011Ch05), unless otherwise stated.
[@] From Adopted Levels for ^{62}Ni.

$^{62}Ni(n,n'\gamma)$ 2011Ch05,1989Ko54 (continued)

$\gamma(^{62}Ni)$

A_2 and A_4 values are from e-mail reply of 17 Nov 2010 from A. Chakraborty, first author of 2011Ch05 (some of these values are also given in the published paper).

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.[‡]	δ[‡]	Comments
1172.97	2^+	1172.95 *11*	100	0.0	0^+	E2		A_2=+0.21 *1*; A_4=−0.16 *2*
2048.67	0^+	875.69 *7*	100	1172.97	2^+	[E2]		A_2=−0.01 *2*; A_4=−0.01 *2*
2301.82	2^+	1128.82 *14*	44.7 *11*	1172.97	2^+	M1+E2	+2.7 *+4−3*	A_2=+0.18 *2*; A_4=−0.11 *3* δ: other: +0.07 *3* or +1.90 *2* (1989Ko54).
		2301.8 *3*	55.3 *18*	0.0	0^+	E2		A_2=+0.44 *4*; A_4=−0.25 *5*
2336.54	4^+	1163.50 *12*	100	1172.97	2^+	E2		A_2=+0.35 *2*; A_4=−0.17 *3*
2890.5	0^+	1717.5 *3*	100	1172.97	2^+	[E2]		A_2=−0.01 *4*; A_4=−0.01 *6*
3058.74	3^+	722.02 *23*	19.8 *15*	2336.54	4^+	M1+E2	+1.6 *+3−9*	A_2=−0.68 *4*; A_4=0.00 *5*
		756.85 *20*	42 *3*	2301.82	2^+	D+Q	−0.08 *2*	A_2=−0.36 *2*; A_4=0.00 *3*
		1885.8 *3*	38 *3*	1172.97	2^+	D(+Q)	−0.03 *+3−2*	A_2=−0.29 *2*; A_4=0.00 *3* δ: other: −0.50 *8* (1985KoZM).
3157.90	2^+	856.09 *12*	7.2 *3*	2301.82	2^+	M1+E2		A_2=+0.29 *5*; A_4=−0.03 *7* δ: +1.9 *+4−3* or +0.09 *7*.
		1984.9 *3*	58.6 *25*	1172.97	2^+	M1+E2		A_2=+0.14 *2*; A_4=−0.01 *3* δ: −0.13 *3* or +3.8 *+7−5* (2011Ch05). Other: −0.14 *5* (1985KoZM).
		3158.0 *15*	34 *4*	0.0	0^+	E2		A_2=+0.38 *3*; A_4=−0.04 *4*
3176.7	4^+	875.0 *4*	6.5 *10*	2301.82	2^+			
		2003.6 *4*	94 *4*	1172.97	2^+	E2		A_2=+0.37 *2*; A_4=−0.12 *3*
3257.51	2^+	955.7 *3*	3.5 *2*	2301.82	2^+	[E2+M1]		
		2084.3 *4*	93 *3*	1172.97	2^+	M1+E2		A_2=+0.56 *6*; A_4=−0.11 *9* δ: +1.03 *+22−70* or +0.43 *+90−12*.
		3257.6 *12*	3.1 *4*	0.0	0^+	E2		A_2=+0.52 *18*; A_4=−0.07 *24*
3269.95	$(1^+,2^+)$	968.2 *5*	>5[†]	2301.82	2^+			
		1221.0[#] *3*	<42[#†]	2048.67	0^+			
		2097.2 *3*	>43[†]	1172.97	2^+			
		3270.0 *22*	<10[†]	0.0	0^+			
3277.5	4^+	2104.5 *3*	100	1172.97	2^+	E2		A_2=+0.42 *2*; A_4=−0.14 *3*
3369.67	1^+	479.3 *6*	2.1 *4*	2890.5	0^+			
		1067.7 *3*	12.6 *13*	2301.82	2^+	M1+E2	+1.6 *+41−11*	A_2=−0.14 *7*; A_4=+0.08 *8*
		1321.1 *3*	9.7 *10*	2048.67	0^+			
		3369.7 *17*	76 *12*	0.0	0^+	D		A_2=−0.26 *3*; A_4=+0.01 *3*
3518.27	2^+	360.5 *4*	1.9 *2*	3157.90	2^+			
		459.3 *3*	7.4 *4*	3058.74	3^+			
		1469.9 *5*	9.8 *4*	2048.67	0^+	E2		A_2=+0.43 *7*; A_4=−0.09 *10*
		2345.3 *4*	74 *4*	1172.97	2^+	M1+E2	+0.32 *6*	A_2=+0.56 *4*; A_4=+0.02 *5* δ: +1.20 *13* also possible, but less likely.
		3519.1 *21*	7.3 *11*	0.0	0^+	E2		A_2=+0.44 *12*; A_4=−0.21 *16*
3522.51	(3^+)	264.94 *25*		3257.51	2^+			I_γ: not measured due to poor statistics.
		463.3 *5*	>4[†]	3058.74	3^+			
		1185.94 *18*	>24[†]	2336.54	4^+	M1+E2	−20 *+8−43*	A_2=−0.22 *5*; A_4=+0.06 *7*
		1221.0[#] *3*	<72[#†]	2301.82	2^+			
3524.4	0^+	2351.4 *4*	100	1172.97	2^+			A_2=−0.03 *7*; A_4=−0.04 *8*
3756.5	3^-	1454.5 *3*	48 *4*	2301.82	2^+			
		2584.1 *5*	52 *4*	1172.97	2^+	D		A_2=−0.53 *15*; A_4=−0.09 *19*
4018	6^+	1682		2336.54	4^+			B(E2)=0.0070 *+70−24* (1989Ko54).

Continued on next page (footnotes at end of table)

$^{62}Ni(n,n'\gamma)$ 2011Ch05,1989Ko54 (continued)

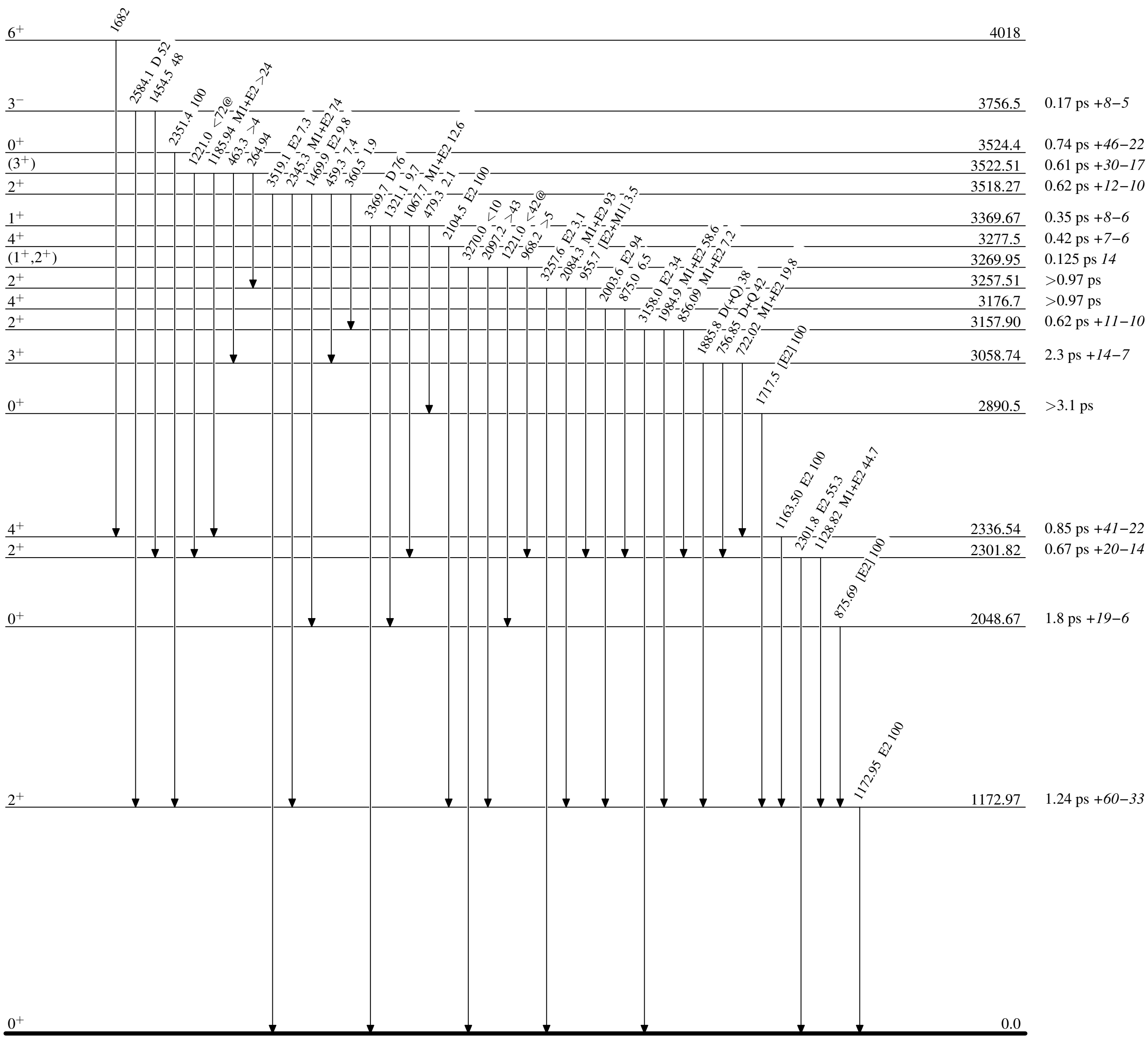
$\gamma(^{62}Ni)$ (continued)

† 1221γ is a doublet, and the intensity could not be measured; consequently, only the limiting branching ratio is given.
‡ From $\gamma(\theta)$ data in 2011Ch05 and RUL.
# Multiply placed with intensity suitably divided.

^{62}Ni(n,n′γ) 2011Ch05,1989Ko54

Level Scheme

Intensities: % photon branching from each level
@ Multiply placed: intensity suitably divided



$^{62}_{28}Ni_{34}$