^{82}Se(^{11}B,p3nγ) 2001St14

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 114, 1 (2013)	20-Oct-2012

2001St14: E=37 MeV. Measured Eγ, Iγ, $\gamma\gamma$, and $\gamma\gamma(\theta)$(DCO) using GASP array consisting of 40 escape-suppressed HPGe detectors and an inner ball containing 80 BGO elements. Comparisons with shell-model calculations involving $0f_{5/2}$, $1p_{3/2}$, $1p_{1/2}$, $0g_{9/2}$ protons and $1p_{1/2}$, $0g_{9/2}$, $1d_{5/2}$ neutrons.

2012Hw05: levels interpreted in terms of one- or two-phonon octupole vibrations.

^{89}Sr Levels

Mean lifetimes for all levels are expected as >5 ps since no Doppler shift attenuation was observed for any of the transitions from levels up to 5115 keV excitation.

E(level)[†]	J^π[‡]	Comments
0.0	5/2$^+$	
2079.43[#] *10*	11/2$^-$	
3388.74[#] *14*	15/2$^-$	
3672.64 *22*	15/2$^-$	
3751.14[#] *16*	17/2$^-$	
4209.14[#] *16*	19/2$^-$	
5115.14[#] *19*	21/2	J^π: positive parity proposed by 2012Hw05 based on coupling of 15/2$^-$ to 3$^-$ octupole state.
5725.9 *4*		
5979.1 *4*	23/2	
6649.9[#] *4*	(25/2)	
6857.5 *5*	(25/2)	
7025.7 *4*	(25/2)	
7421.6[#] *4*	(27/2)	
7984.4? *7*		

[†] From least-squares fit to Eγ data.

[‡] As proposed in 2001St14 based on DCO data, band assignment and previously known values for low-lying levels. The assignments are the same in Adopted Levels, except that parentheses have been added by the evaluator since solid arguments are still lacking.

[#] Band(A): $\nu d_{5/2}\otimes$(^{88}Sr core). Proton excitations in ^{88}Sr coupled to $d_{5/2}$ neutron.

γ(^{89}Sr)

DCO values are for 35° and 90° geometry. The gating transition is stretched quadrupole 1309γ, unless otherwise stated. Expected DCO value is 1.0 for gate on a transition of a similar and pure multipolarity; 0.54 for ΔJ=1, dipole when gate is on ΔJ=2, quadrupole; 1.0 and 1.85 for ΔJ=0, dipole when gated on ΔJ=2, quadrupole and ΔJ=1, dipole, respectively.

E$_\gamma$[‡]	I$_\gamma$	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.[#]	Comments
253.3 *5*	0.5 *1*	5979.1	23/2	5725.9			
283.9 *3*	1.6 *1*	3672.64	15/2$^-$	3388.74	15/2$^-$	D	DCO=0.84 *15*.
362.4 *1*	44 *1*	3751.14	17/2$^-$	3388.74	15/2$^-$	D	DCO=0.57 *2*.
395.9 *3*	1.5[†] *2*	7421.6	(27/2)	7025.7	(25/2)	(D)	DCO=0.34 *10*.
458.0 *1*	27.4[†] *5*	4209.14	19/2$^-$	3751.14	17/2$^-$		
536.5 *3*	1.4 *2*	4209.14	19/2$^-$	3672.64	15/2$^-$		

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^{82}Se(^{11}B,p3nγ) 2001St14 (continued)

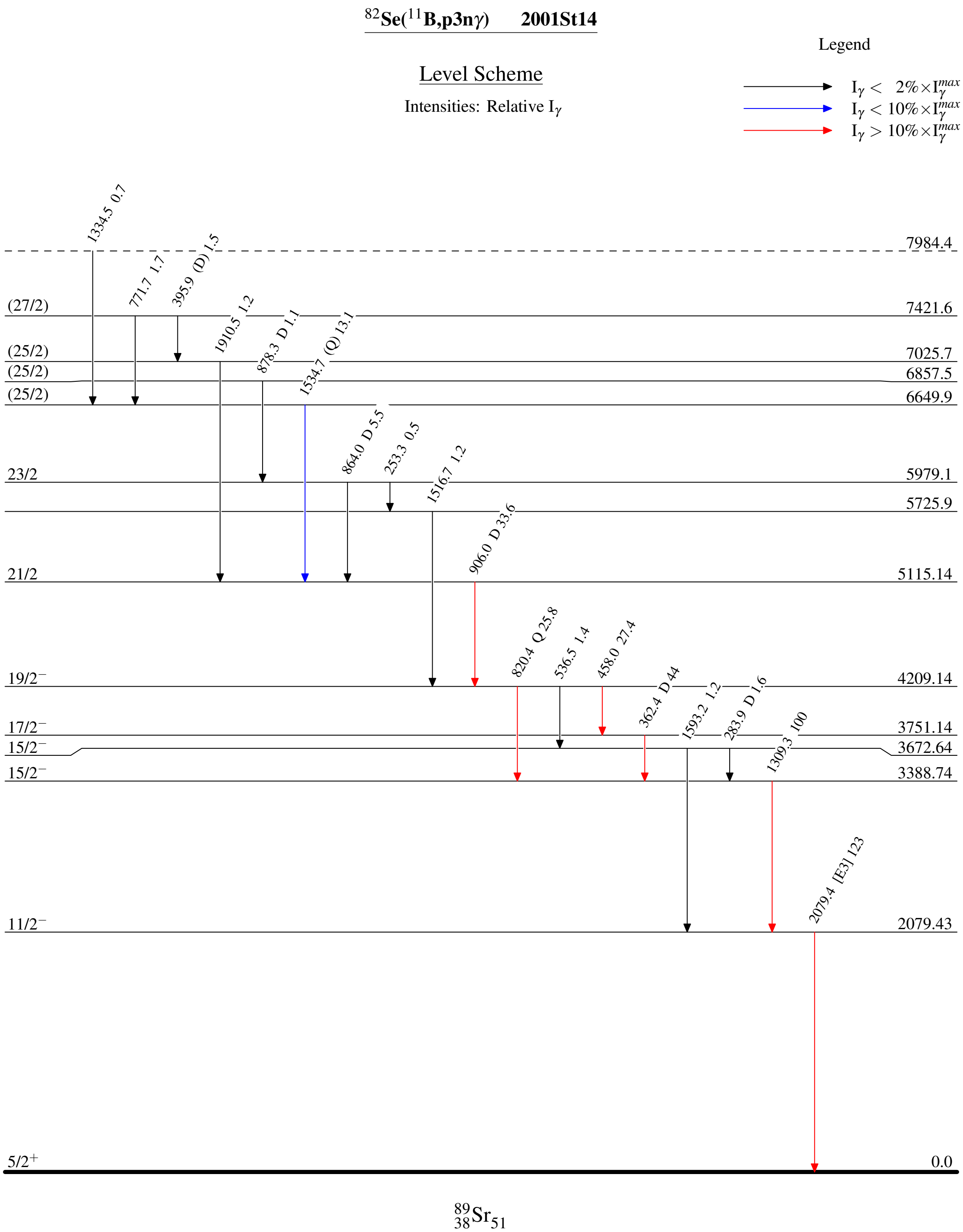
γ(^{89}Sr) (continued)

Eγ[‡]	Iγ	Ei(level)	J^π_i	Ef	J^π_f	Mult.[#]	Comments
771.7 *3*	1.7 *2*	7421.6	(27/2)	6649.9	(25/2)		
820.4 *1*	25.8 *4*	4209.14	19/2$^-$	3388.74	15/2$^-$	Q	DCO=1.00 *4*.
864.0 *3*	5.5 *5*	5979.1	23/2	5115.14	21/2	D	DCO=0.64 *10*.
878.3 *3*	1.1 *4*	6857.5	(25/2)	5979.1	23/2	D	DCO=0.64 *17*.
906.0 *1*	33.6 *9*	5115.14	21/2	4209.14	19/2$^-$	D	DCO=0.54 *2*.
1309.3 *1*	100 *2*	3388.74	15/2$^-$	2079.43	11/2$^-$		
1334.5 *5*	0.7 *2*	7984.4?		6649.9	(25/2)		
1516.7 *3*	1.2 *2*	5725.9		4209.14	19/2$^-$		
1534.7 *5*	13.1[†] *6*	6649.9	(25/2)	5115.14	21/2	(Q)	DCO=1.10 *4*, 1.36 *6* for ΔJ=2, E2 gated; 1.88 *9*, 1.57 *6* for ΔJ=1, M1 gated.
1593.2 *3*	1.2 *1*	3672.64	15/2$^-$	2079.43	11/2$^-$		
1910.5 *3*	1.2 *1*	7025.7	(25/2)	5115.14	21/2		
2079.4 *1*	123 *2*	2079.43	11/2$^-$	0.0	5/2$^+$	[E3]	

[†] Contaminated transition. If DCO is given, it may not represent a correct value due to contribution from a contaminant.

[‡] Δ(Eγ)=0.5 keV for Iγ<1, 0.3 keV for 1<Iγ<10, and 0.1 keV for Iγ>10, based on a general comment by 2001St14.

[#] 2001St04 quote E2 and M1 for ΔJ=2, quadrupole and ΔJ=1, dipole transitions, respectively. These are listed here as Q and D, respectively by the evaluator since no polarization and/or conversion data are available to determine parity. 2001St04 give multipolarities for some other transitions based on Δ(J^π) and earlier studies, these are omitted here. Here mult=D implies ΔJ=1, dipole and mult=Q ΔJ=2, quadrupole transition.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Level Scheme
Intensities: Relative I_γ
Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
7984.4
1334.5 0.7
771.7 1.7
395.9 (D) 1.5
(27/2) 7421.6
1910.5 1.2
878.3 D 1.1
1534.7 (Q) 13.1
(25/2) 7025.7
(25/2) 6857.5
(25/2) 6649.9
864.0 D 5.5
253.3 0.5
1516.7 1.2
23/2 5979.1
5725.9
906.0 D 33.6
21/2 5115.14
820.4 Q 25.8
536.5 1.4
458.0 27.4
19/2$^-$ 4209.14
362.4 D 44
1593.2 1.2
283.9 D 1.6
1309.3 100
17/2$^-$ 3751.14
15/2$^-$ 3672.64
15/2$^-$ 3388.74
2079.4 [E3] 123
11/2$^-$ 2079.43
5/2$^+$ 0.0
$^{89}_{38}Sr_{51}$

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