^{82}Se(^{16}O,5nγ) 2005Fu01

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

E=100 MeV; pulsed beam (<2 ns pulse width, 83 ns repetition rate); 90% isotopically-enriched ^{82}Se target; two BGO Compton-suppressed and one unsuppressed clover-type Ge detectors, two co-axial Ge and one LEPS Ge detectors; two clover-type Ge detectors at 90° with respect to beam axis served as a polarimeter for linear polarization measurement; measured Eγ, Iγ, $\gamma\gamma$ coin (200 ns prompt gate width), γ(t), $\gamma\gamma$(t), $\gamma(\theta)$, linear polarization, delayed $\gamma\gamma$ coin to search for relatively long-lived isomers, lifetimes from centroid shift.

^{93}Mo Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0.0	$5/2^+$		
1363.1 *8*			
1477.1 *3*	$9/2^+$		
2161.6 *5*	$13/2^+$		
2424.6 *6*	$21/2^+$	6.85 h *7*	%IT=99.88 *1* $T_{1/2}$,%IT: from Adopted Levels. Configuration: (ν ($d_{5/2}$)⊗(π ($g^2_{9/2}$)). Analogous to $21/2^+$ isomers In N=51 isotones ^{91}Zr and ^{95}Ru.
4159.0 *6*	$23/2^-$		
4437.4 *7*	$27/2^-$	0.8 ns *2*	$T_{1/2}$: from centroid-shift method (2005Fu01), based on 278γ and 1735γ time distribution spectra. Possible configuration=(ν $d_{5/2}$) ⊗ (11^- isomer in ^{92}Mo) (weak coupling), but additional configurations are also possible as suggested by transition rates (2005Fu01).
4898.8 *6*	$25/2^+$		
5584.7 *7*	$29/2^+$		E(level): intensity imbalance suggests the existence of additional weak, high-energy γ-rays (2005Fu01).
6836.8 *7*	29/2		
7026.2 *7*	$33/2^-$		
7097.0 *8*			
7267.9 *8*	35/2		
8334.5 *8*	(35/2,37/2)		
8353.1 *8*	(31/2,33/2)		Possible γ to $29/2^+$, 5585 level.
8596.9 *8*	(37/2)		
8820.3 *8*	(37/2)		
9000.7 *8*	(33/2,35/2)		Possible γ to $33/2^-$, 7026 level.
9170.3 *8*	(39/2)		
9646.3 *9*	(41/2)		
9669.3 *9*	(35/2,37/2)		
9669.3+x	($39/2^-$)	1.1 μs *+15−4*	E(level): x is expected to be small. The existence of this isomer was deduced by 2005Fu01 from the observation of many delayed gamma rays belonging to ^{93}Mo. The location of the isomer in the level scheme was deduced from intensities of each cascade in the nuclide. Percent population=1.8 *+10−15* (2005Fu01); probably not an yrast state. possible 5-quasiparticle configuration: (ν ($d_{5/2}g_{7/2}h_{11/2}$)⊗(π ($g^2_{9/2}$))$^{39/2-}$.

† From least-squares fit to Eγ, assigning ΔE=0.3 keV to Eγ given to the nearest tenth of a keV and 1 keV to Eγ quoted to the nearest keV.

‡ Authors′ values, based on $\gamma\gamma(\theta)$, $\gamma(\theta)$ and $\gamma\gamma$(lin pol) measurements as well as γ-ray cascade crossover transitions.

^{82}Se(^{16}O,5nγ) 2005Fu01 (continued)

$\gamma(^{93}Mo)$

POL=(1/Q)[($W_{perpendicular}$−$W_{parallel}$)/ ($W_{perpendicular}$+$W_{parallel}$)], where $W_{perpendicular}$ and $W_{parallel}$ are the perpendicular and parallel Compton scattering amplitude, respectively, and Q is the polarization sensitivity of the polarimeter.

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	α [a]	Comments
x		9669.3+x	(39/2$^-$)	9669.3	(35/2,37/2)			
114 @ *1*		1477.1	9/2$^+$	1363.1				
241.6	43 *7*	7267.9	35/2	7026.2	33/2$^-$	D		A_2=−0.19 *4*
260.2 &		7097.0		6836.8	29/2			
262.4 &		8596.9	(37/2)	8334.5	(35/2,37/2)			
263.0		2424.6	21/2$^+$	2161.6	13/2$^+$			
278.4	60 *5*	4437.4	27/2$^-$	4159.0	23/2$^-$	(E2)	0.0312	A_2=+0.10 *5* POL=+0.15 *4*. Iγ(delayed)=0.48 *3*.
476.0	9 # *3*	9646.3	(41/2)	9170.3	(39/2)			
573.4	14 # *5*	9170.3	(39/2)	8596.9	(37/2)			
647.6	2 # *1*	9000.7	(33/2,35/2)	8353.1	(31/2,33/2)			
668.6	2 # *1*	9669.3	(35/2,37/2)	9000.7	(33/2,35/2)			
684.5		2161.6	13/2$^+$	1477.1	9/2$^+$			
685.9	58 # *4*	5584.7	29/2$^+$	4898.8	25/2$^+$	(E2)		A_2=+0.072 *6* POL=+0.06 *3*. Iγ(delayed)=0.46 *13*.
1066.6	10 # *3*	8334.5	(35/2,37/2)	7267.9	35/2			
1147.4	18 *2*	5584.7	29/2$^+$	4437.4	27/2$^-$	(E1)		A_2=−0.37 *13* POL=+0.11 *6*. Iγ(delayed)=0.28 *4*.
1363 @ *1*		1363.1		0.0	5/2$^+$			
1441.5	29 *2*	7026.2	33/2$^-$	5584.7	29/2$^+$	M2		A_2=+0.12 *9* POL=−0.44 *14*.
1477.1		1477.1	9/2$^+$	0.0	5/2$^+$			
1516.3	2 # *1*	8353.1	(31/2,33/2)	6836.8	29/2			
1552.4	6 # *2*	8820.3	(37/2)	7267.9	35/2			
1570.7	5 *1*	8596.9	(37/2)	7026.2	33/2$^-$			
1734.4	100 *6*	4159.0	23/2$^-$	2424.6	21/2$^+$	(E1)		A_2=−0.39 *7* POL=+0.023 *6*. Iγ(delayed)=0.60 *8*.
2399.4	8 *1*	6836.8	29/2	4437.4	27/2$^-$			
2474.1	57 *3*	4898.8	25/2$^+$	2424.6	21/2$^+$	(E2)		A_2=+0.17 *8* POL=+0.019 *9*. Iγ(delayed)=0.22 *4*.

† Delayed gamma-ray intensities are given under comments. These are deduced from $\gamma\gamma$(t) spectrum and normalized to the relative intensities of the prompt spectrum.

‡ Based on $\gamma\gamma(\theta)$ and linear polarization.

Estimated from $\gamma\gamma$ coin data.

@ From figure 3 of 2005Fu01; not listed in authors′ table 1.

& The 260.2γ and 262.4γ form an unresolved doublet.

[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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Level Scheme

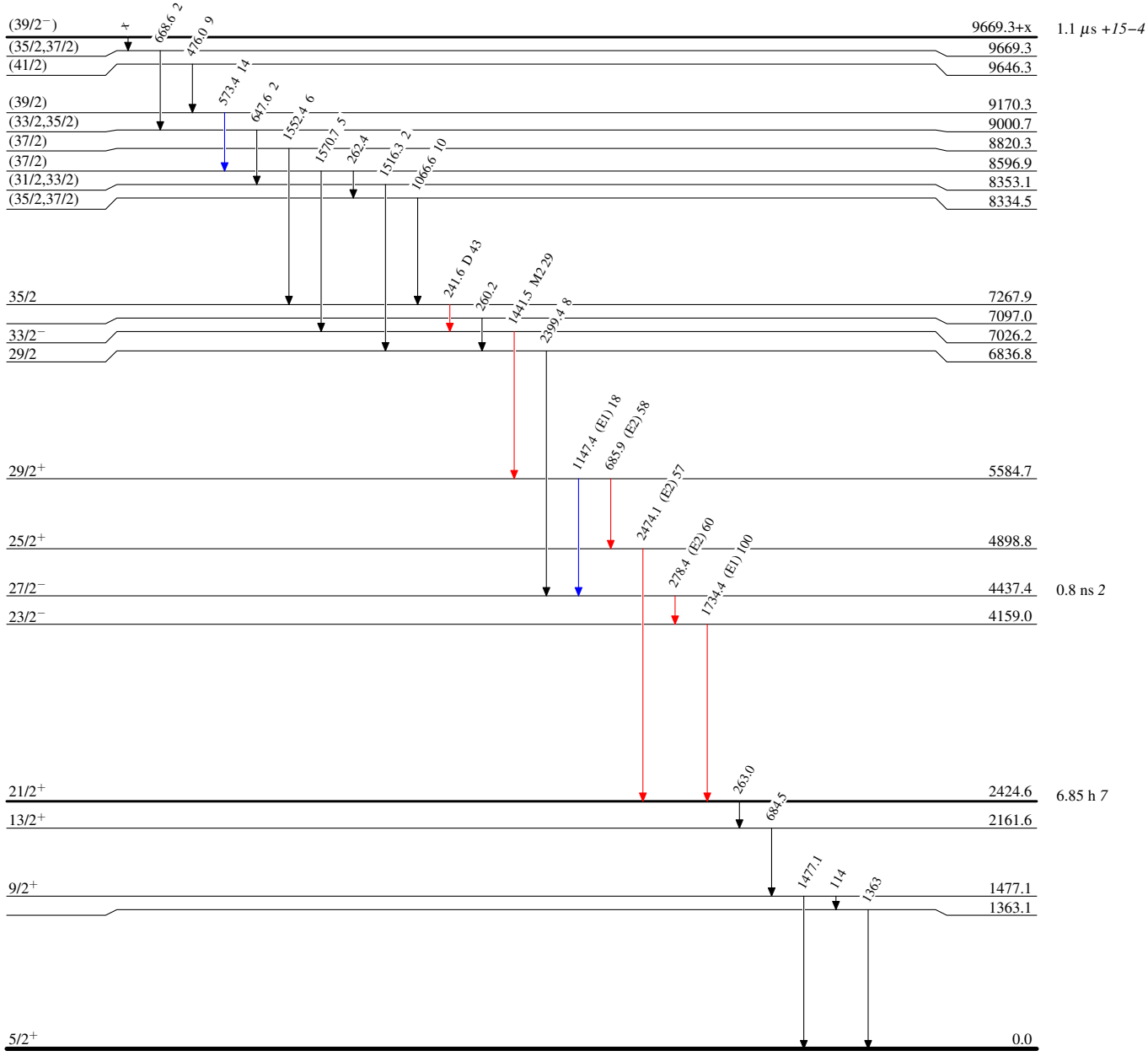
Intensities: Relative I_γ

Legend

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

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

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



$^{93}_{42}Mo_{51}$