^{148}Sm(γ,γ') 2005Li14,1993Zi05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 117, 1 (2014)	1-Oct-2013

2005Li14: Eγ≤3.2 MeV; measured Eγ, Iγ, $\gamma(\theta)$, for θ=90°, 127°, and 150°, $\Gamma_{\gamma 0}$, transition strengths. Deduced J values, $T_{1/2}$ values, and absolute photon scattering cross sections (relative to known cross sections In ^{27}Al). Identified 2$^+$, 2146-keV level As one-phonon $2^+_{1,ms}$ mixed-symmetry state.

1993Zi05: Eγ=2-4 MeV; measured Eγ, Iγ, $\gamma(\theta)$, for θ=90°, 127°, of resonance fluorescence spectrum.

1976Me17: Eγ=1.2-3.8 MeV; measured $\sigma(\theta)$.

Others: 1965Me04, 1990Zi06, 1991Ra03, 1991Ri02.

Below 3082 level data are mostly from 2005Li14 and 1993Zi05; above this level all data are from 1993Zi05.

^{148}Sm Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	$\Gamma_{\gamma 0}$ (meV)	Comments
0.0	0$^+$			
550.255[@] *8*	2$^+$			Additional information 1.
1161.529[@] *12*	3$^-$			Additional information 2.
1454.10 *15*	2$^+$	285 fs *28*	0.80 *8*	$\Gamma_{\gamma 0}$: from 2005Li14.
1465.160 *16*	1$^-$	92 fs *8*	3.25 *25*	$\Gamma_{\gamma 0}$: from 2005Li14. $T_{1/2}$: other: 0.097 ps *+14−11* from $\Gamma_{\gamma 0}$=0.0031 eV *4* (1976Me17), and adopted $\Gamma_{\gamma 0}/\Gamma$=0.659 *7*.
1920.97[@] *6*	0$^+$			Additional information 3.
2146.62 *18*	2$^+$	<64.1 fs	1.20 *24*	E(level): 2146.35 *3* quoted by 2005Li14 As from 2000Bh03. $\Gamma_{\gamma 0}$: from 2005Li14.
2284.42 *4*	1	46 fs *5*	4.3 *4*	J$^\pi$: (1,2$^+$) (2000Bh03). $\Gamma_{\gamma 0}$: from 2005Li14.
2381.1 *4*	2$^{(+)}$	87 fs *17*	1.6 *3*	J$^\pi$: 2 from angular correlation ratios (2005Li14), π=(+) from more likely E2 quadrupole 2381γ to 0$^+$, g.s.; 3$^+$,4$^+$ (2000Bh03). $\Gamma_{\gamma 0}$: from 2005Li14.
2472.23 *19*	1	37 fs *3*	6.5 *4*	$\Gamma_{\gamma 0}$: from 2005Li14.
2512.3 *5*	1	99 fs *5*	6.6 *4*	$\Gamma_{\gamma 0}$: from 2005Li14. Other: $\Gamma_{\gamma 0}$=9.1 *6* (1993Zi05); $\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=0.00 *5* (1993Zi05).
2704.91 *17*	1	20.1 fs *12*	17 *1*	J$^\pi$: (1,2$^+$) (2000Bh03). $\Gamma_{\gamma 0}$: from 2005Li14.
2762.6 *5*	1$^+$	7.5 fs *4*	36.1 *9*	J$^\pi$: (1,2$^+$) (2000Bh03). B(E1)=4.6×10^{-5} *3* (1993Zi05 for E1 transition which however is actually M1 (2005Li14)). $\Gamma_{\gamma 0}$: from 2005Li14. $\Gamma_{\gamma 0}$=33.9 *21* (1993Zi05); $\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=0.68 *4*.
3038.8 *6*	1	41.4 fs *22*	11.0 *6*	J$^\pi$: (1,2$^+$) (2000Bh03). B(M1)=0.12 *8* (1993Zi05 for M1 transition which however is not fully confirmed by 2005Li14 (D)). $\Gamma_{\gamma 0}$: from 2005Li14. $\Gamma_{\gamma 0}$=13 *9* (1993Zi05); $\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=0.68 *4*.
3082.1 *4*	1	10.2 fs *7*	41 *3*	J$^\pi$: (1,2$^+$) (2000Bh03). B(M1)=0.39 *4* (1993Zi05 for M1 transition which however is not fully confirmed by 2005Li14 (D)). $\Gamma_{\gamma 0}$: from 2005Li14. $\Gamma_{\gamma 0}$=35 *10* (1993Zi05); $\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=0.10 *3*.
3255.3 *5*	(1,2$^+$)		53 *3*	B(E1)↑=4.4×10^{-5} *3* $\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=1.37 *8*.
3291.5 *5*	(1,2$^+$)		20.7 *23*	B(E1)↑=1.7×10^{-5} *2* $\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=1.10 *14*.
3451.9 *5*	(1,2$^+$)		15.4 *12*	$\Gamma_{\gamma 1}/\Gamma_{\gamma 0}$=0.00 *6*.
3483.6 *5*	(1,2$^+$)		88 *22*	B(E1)↑=6.0×10^{-5} *15*

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^{148}Sm(γ,γ′) 2005Li14,1993Zi05 (continued)

^{148}Sm Levels (continued)

E(level)†	Jπ‡	Γγ0 (meV)	Comments
			Γγ1/Γγ0=0.05 *1*.
3534.9 *5*	(1,2+)	89 *6*	B(E1)↑=5.8×10−5 *4* Γγ1/Γγ0=0.20 *1*.
3586.0 *5*	(1,2+)	7.2 *11*	Γγ1/Γγ0=0.00 *9*.
3812.0 *5*	(1,2+)	33 *3*	Γγ1/Γγ0=0.00 *4*.
3843.6 *5*	(1,2+)	12 *4*	B(E1)↑=0.6×10−5 *2* Γγ1/Γγ0=1.4 *4*.
3884.3 *5*	(1,2+)	51 *4*	Γγ1/Γγ0=0.00 *3*.
3895.4 *5*	(1,2+)	28 *3*	Γγ1/Γγ0=0.00 *5*.

† From a least-squares fit to Eγ data.
‡ Up to 3082.0 level inclusively, adopted by 2005Li14 from angular correlation ratios, unless indicated otherwise; above 3082.0 level, from Adopted Levels, Gammas dataset.
# From 2005Li14, unless indicated otherwise.
@ From 2000Bh03 (hold fixed In the least-squares fit to Eγ data).

γ(^{148}Sm)

Ei(level)	Jiπ	Eγ	Iγ	Ef	Jfπ	Mult.	Comments
1454.10	2+	903.83 *15*	100 *2*	550.255	2+	[M1,E2]	Eγ: from 2005Li14. Iγ: quoted by 2005Li14 As from 2000Bh03. B(M1)=0.0147 *19* (2005Li14); B(E2)=1388×10−4 *150* (2005Li14).
		1454.2 *5*	99.6 *2*	0.0	0+	E2	Eγ: from 2005Li14. Iγ: quoted by 2005Li14 As from 2000Bh03. B(E2)=152×10−4 *15* (2005Li14).
1465.160	1−	303.59 *3*	0.17 *2*	1161.529	3−	[E2]	Eγ,Iγ: quoted by 2005Li14 As from 2000Bh03. B(E2)=2648×10−4 *380* (2005Li14).
		914.916 *15*	51.6 *4*	550.255	2+	[E1]	Eγ,Iγ: quoted by 2005Li14 As from 2000Bh03. B(E1)=2.09×10−5 *24* (2005Li14).
		1465.3 *6*	100 *3*	0.0	0+	[E1]	Eγ: from 2005Li14; other: 1465 (1993Zi05). Iγ: quoted by 2005Li14 As from 2000Bh03. B(E1)=0.98×10−5 *8* (2005Li14).
2146.62	2+	985.16 *20*	10.4 *12*	1161.529	3−	[E1]	Eγ,Iγ: quoted by 2005Li14 As from 2000Bh03. B(E1)=≥0.607×10−5 (2005Li14).
		1596.1 *4*	100 *11*	550.255	2+	[M1]	Eγ,Iγ: from 2005Li14. B(M1)=≥0.116 (2005Li14).
		2146.3	<17	0.0	0+	[E2]	Eγ,Iγ: from 2005Li14. B(E2)=32.5×10−4 *65* (2005Li14).
2284.42	1	362.8† *2*	<5	1920.97	0+		Eγ,Iγ: quoted by 2005Li14 As from 2000Bh03.
		819.27 *3*	30 *5*	1465.160	1−	[D]	Eγ,Iγ: quoted by 2005Li14 As from 2000Bh03. B(M1)=0.205 *41* (2005Li14); B(E1)=2.26×10−5 *46* (2005Li14).
		1734.2 *4*	99 *6*	550.255	2+	[D]	Eγ,Iγ: from 2005Li14. B(M1)=0.0712 *80* (2005Li14); B(E1)=0.768×10−5 *89* (2005Li14).
		2284.5 *3*	100 *6*	0.0	0+	[D]	Eγ,Iγ: from 2005Li14. B(M1)=0.0315 *30* (2005Li14); B(E1)=0.347×10−5 *34* (2005Li14).
2381.1	2(+)	1830.9 *5*	100 *10*	550.255	2+	[M1,E2]	Eγ,Iγ: from 2005Li14.

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^{148}Sm(γ,γ') 2005Li14,1993Zi05 (continued)

$\gamma(^{148}Sm)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
							B(M1)=0.042 *10* (2005Li14); B(E2)=38×10^{-4} *14* (2005Li14).
2381.1	2$^{(+)}$	2381.1 *6*	43 *7*	0.0	0$^+$	[E2]	E_γ,I_γ: from 2005Li14. B(E2)=25.8×10^{-4} *42* (2005Li14).
2472.23	1	1922.0 *5*	92 *8*	550.255	2$^+$	[D]	E_γ,I_γ: from 2005Li14. B(M1)=0.072 *8* (2005Li14); B(E1)=0.80×10^{-5} *9* (2005Li14).
		2472.2 *2*	100 *3*	0.0	0$^+$	[D]	E_γ,I_γ: from 2005Li14. B(M1)=0.0372 *25* (2005Li14); B(E1)=0.411×10^{-5} *27* (2005Li14).
2512.3	1	2512.3 *5*	100 *3*	0.0	0$^+$	[D]	E_γ: weighted average of 2512.3 *5* (1993Zi05) and 2513.5 *2* (2005Li14). I_γ: from 2005Li14. B(M1)=0.0361 *19* (2005Li14); B(E1)=0.400×10^{-5} *21* (2005Li14).
2704.91	1	2154.6 *3*	33.5 *22*	550.255	2$^+$	[D]	E_γ,I_γ: from 2005Li14. B(M1)=0.0492 *42* (2005Li14); B(E1)=0.544×10^{-5} *48* (2005Li14).
		2704.9 *2*	100 *3*	0.0	0$^+$	[D]	E_γ,I_γ: from 2005Li14. B(M1)=0.0742 *42* (2005Li14); B(E1)=0.821×10^{-5} *47* (2005Li14).
2762.6	1$^+$	2213.0 *10*	68 *4*	550.255	2$^+$	[M1]	E_γ: from 2005Li14. I_γ: from 1993Zi05. B(M1)=0.196 *16* (2005Li14).
		2762.4 *5*	100 *2*	0.0	0$^+$	[M1]	E_γ: weighted average of 2762.1 *5* (1993Zi05) and 2763.2 *9* (2005Li14). I_γ: from 2005Li14. B(M1)=0.1480 *79* (2005Li14).
3038.8	1	2489	<10	550.255	2$^+$		E_γ: from 2005Li14. I_γ: from 1993Zi05.
		3038.5 *7*	100 *4*	0.0	0$^+$	[D]	E_γ: weighted average of 3037.6 *5* (1993Zi05) and 3039.0 *4* (2005Li14). I_γ: from 2005Li14. B(M1)=0.0339 *19* (2005Li14); B(E1)=0.374×10^{-5} *21* (2005Li14).
3082.1	1	2531.9 *9*	8.8 *15*	550.255	2$^+$	[D]	E_γ,I_γ: from 2005Li14. B(M1)=0.194 *36* (2005Li14); B(E1)=0.215×10^{-5} *40* (2005Li14).
		3082.0 *4*	100 *3*	0.0	0$^+$	[D]	E_γ: weighted average of 3080.9 *5* (1993Zi05) and 3082.2 *2* (2005Li14). I_γ: from 2005Li14. B(M1)=0.1219 *86* (2005Li14); B(E1)=1.348×10^{-5} *95* (2005Li14).
3255.3	(1,2$^+$)	3255.3 *5*		0.0	0$^+$		
3291.5	(1,2$^+$)	3291.5 *5*		0.0	0$^+$		
3451.9	(1,2$^+$)	3451.9 *5*		0.0	0$^+$		
3483.6	(1,2$^+$)	3483.6 *5*		0.0	0$^+$		
3534.9	(1,2$^+$)	3534.9 *5*		0.0	0$^+$		
3586.0	(1,2$^+$)	3586.0 *5*		0.0	0$^+$		
3812.0	(1,2$^+$)	3811.9 *5*		0.0	0$^+$		
3843.6	(1,2$^+$)	3843.5 *5*		0.0	0$^+$		
3884.3	(1,2$^+$)	3884.2 *5*		0.0	0$^+$		
3895.4	(1,2$^+$)	3895.3 *5*		0.0	0$^+$		

† Placement of transition in the level scheme is uncertain.

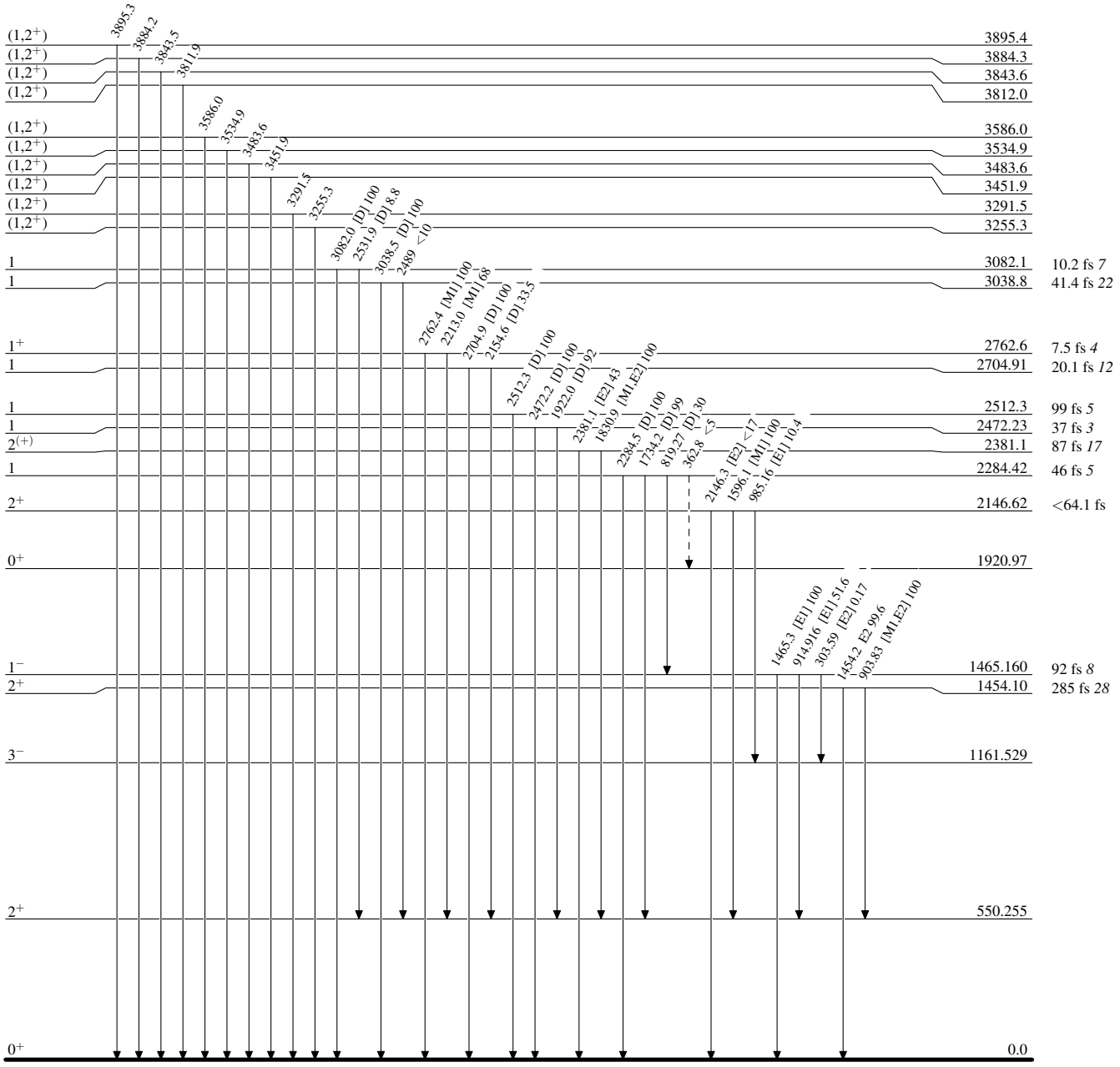
^{148}Sm(γ,γ') 2005Li14,1993Zi05

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{148}_{62}Sm_{86}$