

(HI,xnγ) 2008Li08,1997Su11

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli		NDS 112, 1949 (2011)	1-Jun-2010

2008Li08,2002Li22: ⁹⁹Ru(⁴⁸Ti,2p3nγ) E=240 MeV and ¹¹⁴Sn(³²S,2p2n) at 160 MeV. Measured Eγ, Iγ, γγ, γ(θ), γ(lin pol), γγ(θ)->(DCO) using EUROBALL III array consisting of 15 CLUSTER detectors, 26 CLOVER detectors, 30 individual Compton-suppressed Ge detectors, and charged-particle detector array ISIS consisting of 40 Si particle telescopes. Earlier experiment by the by the same group using the same reaction (**2002Li22**). These experiments were performed at the XTU tandem accelerator facility at Legnaro. Comparisons of level energies and B(E2) values with model calculations.

2008Li08,2005Pa07: ¹¹⁴Sn(³²S,2p2nγ),E=160 MeV. Measured Eγ, Iγ, lifetimes using EUROBALL IV array of 14 CLUSTER, 26 CLOVER and 30 individual HPGe detectors with Compton-suppression with an inner BGO ball. Particles detected by EUCLIDES array. Measurement of lifetimes by using DSA method. Measured polarizations.

2008Ca16: analyzed rotational bands from their earlier studies using cranking model and interpretation in terms of triaxial shape for the highest spin around 30. The lifetimes given in table I of their paper are the same as in **2008Li08**.

1999LiZX: ⁹⁹Ru(⁴⁸Ti,2p3nγ) E=240 MeV. Euroball III. Used 40 Si- detector charged-particle array mounted in the center of γ-detector array for isotopic separation. Measured γγγ gated by one and two-p. Level scheme presented was preliminary but extended that of **1997Su11** and is now superseded by **2008Li08**.

1997Su11: ¹¹¹Cd(³⁵Cl,p3nγ) E=170 MeV. Measured γ (11 BGO anti-Compton spect), γγ, γγγ, DCO ratios.

1988St02: ¹⁴⁴Sm(α,6nγ) E(α)=95 MeV, ¹¹⁰Cd(³⁵Cl,p2nγ) E(³⁵Cl,³⁷Cl)=148 MeV (**1988St02,1986Lu07**), ⁹⁶Ru(⁵²Cr,α2pγ) E(⁵²Cr)=240 MeV, ⁹²Mo(⁵⁴Fe,4pγ) E(⁵⁴Fe)=260 MeV, ⁹²Mo(⁵⁶Fe,α2pγ) E(⁵⁶Fe)=250 MeV (**1987Go10**).

Measured: γ, γγ, γ(θ), γ(t) (**1988St02**); γ, γγ, γ-particle coin, γ-K x ray (**1987Go10**).

1986Lu07: ¹⁴⁴Sm(α,6n) E=65-107 MeV and ¹¹⁰Cd(³⁵Cl,p2n) at 148 MeV. Measured excitation functions, coincidences, and angular distributions. The anisotropy measurement in this reference is defined as (I_{0°} - I_{45°})/I_{0°}.

All data are from **2008Li08**, unless otherwise noted.

¹⁴²Gd Levels

Dipole bands can be associated with small oblate deformations.

E(level)@	Jπ [†]	Comments
0.0 ^a	0 ⁺	
515.00 ^a 10	2 ⁺	
1208.60 ^a 23	4 ⁺	
2002.0 ^a 3	6 ⁺	
2031.7 ^d 3	5 ⁻	
2341.8 ^d 3	(7 ⁻)	
2535.1 ^{&} 5		
2753.1 ^{&} 11		
2757.8 ^a 4	8 ⁺	
2944.8 4	(8 ⁻)	
3069.6 ^d 4	(9 ⁻)	
3136.7 ^c 4	(10 ⁺)	
3164.9 ^b 4	10 ⁺	
3303.9 ^{&} 9		
3408.0 ^a 4	10 ⁺	
3709.3 ^b 4	12 ⁺	
3728.5 ^c 4	(12 ⁺)	
3737.1 ^{&} 15		
3749.8 ^{&} 11	10	
3788.3 4	(10 ⁻)	Jπ: supported from M1+E2 from the 719.

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(HL,xn γ) 2008Li08,1997Su11 (continued) ^{142}Gd Levels (continued)

E(level)@	J π [†]	T _{1/2} [‡]	Comments
Additional information 1.			
3838.5 5	11 ⁺		
3939.7 ^d 4	11 ⁻		
4068.2 ^{&} 9	(12 ⁻)		
4101.6 ^a 4	12 ⁺		
4450.7 ^b 4	14 ⁺	1.04 ps +16-12	J π supported by stretched E2 to 12 ⁺ .
4466.4 4	13 ⁺		
4546.2 5	(11 ⁻)		
4549.8 ^{&} 15	(12)		
4768.2 ^h 4	12 ⁻		
4778.9 ^c 5	(14 ⁺)	0.80 ps 21	
4785.6 ^d 4	13 ⁻		
4862.5 ^{&} 11	(13)		
4892.6 ^{&} 11	(14 ⁺)		
4899.2 ^a 5	(14 ⁺)	1.6 ps +4-3	
4990.6 ^h 4	13 ⁻		
5070.5 ^{&} 15	(14)		
5183.9 ^h 5	14 ⁻		J π supported by ADO, DCO and α (exp).
5228.8 ^{&} 18	(13)		
5278.2 4	15 ⁺		
5285.0 ^b 4	16 ⁺	0.35 ps +7-5	
5301.5 ^{&} 18	(15)		
5325.8 ^{&} 18	(14)		
5418.4 ^l 5	15 ⁻		E(level): this level was defined at 5378.6 in 2002Li22 due to reversed ordering of 234.5 γ -192.6 γ cascade. J π supported by α (exp) and ADO.
5425.9 ^{&} 11	(15)		
5445.3 ^h 5	15 ⁻		J π further support from band placement.
5540.8 ^d 4	15 ⁻		
5604.7 ^c 5	(16 ⁺)	1.8 ps +7-5	
5610.9 ^l 5	16 ⁻		J π : Supported by multiplicities of 166 and 193 transitions to established levels and internal conversion coefficients.
5614.2 ^{&} 11	(16 ⁺)		
5638.6 ^{&} 15	(16 ⁺)		
5809.5 ^a 5	(16 ⁺)	0.55 ps +25-17	J π suggested by band placement.
5813.0 ^h 5	16 ⁻	0.35 ps +11-8	
5896.6 ^l 5	17 ⁻	0.90 [#] ps 35	J π : Supported by ADO and polarization measurements of the 286 transition to a 16 ⁻ level.
5912.6 ⁱ 5	(16 ⁺)		
6126.5 ^b 5	18 ⁺	0.38 ps 6	
6176.7 ⁱ 4	17 ⁺	1.5 [#] ps +6-4	
6215.7 5	17 ⁺		
6260.1 ^g 5	(18 ⁺)		
6271.0 ^l 5	18 ⁻	0.76 [#] ps 21	B(M1)/B(E2)=13.1 +27-14 (2005Pa07). J π supported by ADO and polarization.
6282.9 ^c 5	(18 ⁺)		
6286.7 ^h 5	17 ⁻	0.49 ps +17-10	
6398.6 ^{&} 11	(18)		

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(HL,xn γ) 2008Li08,1997Su11 (continued) ^{142}Gd Levels (continued)

E(level)@	J $^{\pi}$ †	T _{1/2} ‡	Comments
6477.3 ⁱ 4	18 ⁺	0.90 [#] ps +28-21	J $^{\pi}$ supported by ADO and polarization measurements.
6566.0 ^l 5	19 ⁻	1.11 [#] ps +35-21	B(M1)/B(E2)=9.7 +12-8 (2005Pa07). J $^{\pi}$ supported by ADO and polarization.
6620.5 ^h 6	18 ⁻	>1.0 ps	
6858.4 ⁱ 5	19 ⁺	0.37 [#] ps +17-10	B(M1)/B(E2)=56 +83-8 (2005Pa07). J $^{\pi}$ supported by ADO and polarization of 381 transition.
6916.3 ^b 5	(20 ⁺)	0.49 ps +7-5	
7027.7 ^e 6	19 ⁺		Spin/parity of 19 ⁺ supported by M1+E2 multipolarity of 902 transition to 18 ⁺ .
7071.0 ^h 7	19 ⁻	>1.0 ps	
7093.1 ^l 5	20 ⁻	0.43 [#] ps 9	B(M1)/B(E2)=14 +5-2 (2005Pa07).
7137.4 ^g 5	20 ⁺		
7175.3 ^c 5	(20 ⁺)	1.18 ps 22	
7285.1 ⁱ 5	20 ⁺	0.36 [#] ps +14-10	J $^{\pi}$ supported by ADO and polarization of the 427 transition. B(M1)/B(E2)=53 +25-8 (2005Pa07).
7455.0 ^h 8	(20 ⁻)	>1.4 ps	
7501.8 5	(20 ⁺)		J $^{\pi}$: Suggested by level scheme placement.
7531.6 10	(20 ⁺)		
7559.4 ^l 5	21 ⁻	0.49 [#] ps +12-10	B(M1)/B(E2)=8.1 +15-11 (2005Pa07).
7596.9 ^e 6	(21 ⁺)	0.76 ps +21-17	
7625.2 ^f 7	(21 ⁺)		
7645.4 ⁱ 5	21 ⁺	0.65 [#] ps +15-11	J $^{\pi}$ supported by ADO, polarization and α . B(M1)/B(E2)=55 +20-9 (2005Pa07).
7779.3 ^j 5	22 ⁺		J $^{\pi}$: Supported by 604 stretched E2 transition to 20 ⁺ and 134 M1/E2 to 21 ⁺ and α .
7826.9 ^b 6	(22 ⁺)	0.26 ps 5	
7843.9 ^k 6	21 ⁻		
8017.8 ⁱ 5	22 ⁺	0.68 [#] ps +28-17	
8092.9 ^g 6	(22 ⁺)		
8159.4 11	(22 ⁺)		
8198.4 ^k 6	22 ⁻	0.30 [#] ps +14-12	
8248.8 ^j 5	23 ⁺	0.23 [#] ps 8	
8328.1 ^e 6	(23 ⁺)	0.58 ps 12	
8568.0 ^f 7	(23 ⁺)		
8592.5 ^j 5	24 ⁺	0.44 [#] ps 10	B(M1)/B(E2)=13.3 +31-21 (2005Pa07).
8636.9 ^k 6	23 ⁻	0.53 [#] ps +17-14	B(M1)/B(E2)=2.2 +23-4 (2005Pa07).
8730.2 6	24 ⁺		
8807.1 ^b 7	24 ⁺	0.236 ps 35	
8963.3 ^k 6	24 ⁻	0.83 [#] ps +28-21	B(M1)/B(E2)=2.6 ¹¹⁴⁻⁷ (2005Pa07).
9140.7 ^j 6	25 ⁺	0.24 [#] ps 10	
9222.6 ^g 10	(24 ⁺)		
9280.2 ^e 8	(25 ⁺)	0.19 ps 8	
9474.8 ^k 6	(25 ⁻)		B(M1)/B(E2)=2.3 +16-6 (2005Pa07).
9628.1 ^f 7	(25 ⁺)		
9700.3 ^j 8	26 ⁺	0.19 [#] ps 10	
9746.8 ^b 7	(26 ⁺)	0.31 ps 7	
9858.5 ^k 7	26 ⁻		B(M1)/B(E2)=2.3 +16-7 (2005Pa07).
10096.6 8	(25 ⁺)		
10102.4 ^g 12	(26 ⁺)		
10311.7 ^j 8	27 ⁺		

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(HL,xn γ) 2008Li08,1997Su11 (continued) ^{142}Gd Levels (continued)

<u>E(level)[@]</u>	<u>Jπ[†]</u>	<u>E(level)[@]</u>	<u>Jπ[†]</u>	<u>E(level)[@]</u>	<u>Jπ[†]</u>
10395.3 ^e 9	(27 ⁺)	10989.3 ^j 9	(28 ⁺)	11825.4 ^b 9	(30 ⁺)
10702.9 ^b 8	(28 ⁺)	11123.2 10	(27 ⁺)	12384.1 ^e 11	(31 ⁺)
10809.2 ^f 8	(27 ⁺)	11352.1 ^e 10	(29 ⁺)	13134.6 ^b 13	(32 ⁺)
				14580.3 ^b 15	(34 ⁺)

[†] Based on multipolarities from ADO measurements (2008Li08) when available. Stretched quadrupole are assumed to be E2. Different or complementary support is noted in the comments.

[‡] From DSA measurement (2008Li08), unless otherwise stated.

From DSA (2005Pa07).

@ From least-squares fit to E γ 's.

& Given by 1997Su11, not seen In 2008Li08.

^a Band(A): g.s. band (2008Li08).

^b Band(B): (π,α)=(+,0) band. Band based on 10⁺, Configuration=(ν h_{11/2})⁻² corresponds to triaxial nuclear shape (1999LiZX).

^c Band(C): (π,α)=(+,0) band. Configuration=(π h_{11/2})⁺² Band based on 10⁺, α .

^d Band(D): Band based on 5⁻, $\alpha=1$.

^e Band(E): $\Delta J=2$ band based on 19⁺.

^f Band(F): $\Delta J=2$ band based on (21⁺).

^g Band(G): $\Delta J=2$ band based on 18⁺.

^h Band(H): Magnetic-dipole band based on 12⁻. Probable configuration= $\nu h_{11/2}^{-2} \pi (h_{11/2} g_{7/2}^{-1})$.

ⁱ Band(I): Magnetic-dipole band based on 16⁺. Probable configuration= $\nu h_{11/2}^{-2} \pi h_{11/2}^2$ Possible interpretation as shears band (1997Su11).

^j Band(J): Magnetic-dipole band based on 22⁺. Probably originates from 16⁺ dipole band through band crossing due to a second h_{11/2} neutron-hole pair.

^k Band(K): Magnetic-dipole band based on 21⁻. Probably originates from 11⁻ dipole band through band crossing due to a second h_{11/2} neutron-hole pair.

^l Band(L): Magnetic-dipole band based on 15⁻.

$\gamma(^{142}\text{Gd})$

ADO=angular distribution, when one γ ray is emitted from an oriented state and the other from a fully deoriented state. Expected value of ADO is ≈ 1.34 for $\Delta J=2$, pure stretched quadrupole and ≈ 0.81 for pure stretched dipole. The evaluators assume for this decay scheme that pure stretched quadrupoles correspond to E2 multipolarity and possibly mixed transitions are M1+E2. Values are from 2008Li08. Some values were also given by 2002Li22. When different, these are noted under comments.

POL values are from 2002Li22.

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\delta^\#$	α^\dagger	Comments
67.3 4	1.5 2	3136.7	(10 ⁺)	3069.6	(9 ⁻)	E1		0.840 18	$\alpha(\text{K})=0.697$ 15; $\alpha(\text{L})=0.1126$ 25; $\alpha(\text{M})=0.0244$ 6; $\alpha(\text{N}+..)=0.00632$ 14 $\alpha(\text{N})=0.00549$ 12; $\alpha(\text{O})=0.000786$ 17; $\alpha(\text{P})=3.68 \times 10^{-5}$ 8
70.0 2	1.2 2	5610.9	16 ⁻	5540.8	15 ⁻	M1+E2		7.7 21	$\alpha(\text{exp})=6.8$ 17 $\alpha(\text{K})=3.7$ 11; $\alpha(\text{L})=3.1$ 25; $\alpha(\text{M})=0.7$ 6; $\alpha(\text{N}+..)=0.18$ 15 $\alpha(\text{N})=0.16$ 13; $\alpha(\text{O})=0.021$ 17; $\alpha(\text{P})=0.00024$ 12
133.9 2	2.7 3	7779.3	22 ⁺	7645.4	21 ⁺	M1+E2		0.879 14	$\alpha(\text{N})=0.16$ 13; $\alpha(\text{O})=0.021$ 16; $\alpha(\text{P})=0.00024$ 12 $\alpha(\text{K})=0.63$ 12; $\alpha(\text{L})=0.19$ 9; $\alpha(\text{M})=0.045$ 22; $\alpha(\text{N}+..)=0.012$ 6 $\alpha(\text{N})=0.010$ 5; $\alpha(\text{O})=0.0014$ 6; $\alpha(\text{P})=4.1 \times 10^{-5}$ 15 $\alpha(\text{exp})=0.74$ 16 ADO=0.47 0.09.
143.5 2	0.4 2	7645.4	21 ⁺	7501.8	(20 ⁺)	M1+E2		0.706 19	$\alpha(\text{K})=0.51$ 10; $\alpha(\text{L})=0.15$ 7; $\alpha(\text{M})=0.034$ 15; $\alpha(\text{N}+..)=0.009$ 4 $\alpha(\text{N})=0.008$ 4; $\alpha(\text{O})=0.0011$ 4; $\alpha(\text{P})=3.4 \times 10^{-5}$ 12 $\alpha(\text{exp})=0.8$ 3
165.7 2	2.3 5	5610.9	16 ⁻	5445.3	15 ⁻	M1+E2		0.45 4	$\alpha(\text{exp})=0.38$ 11 $\alpha(\text{K})=0.34$ 7; $\alpha(\text{L})=0.09$ 3; $\alpha(\text{M})=0.020$ 7; $\alpha(\text{N}+..)=0.0051$ 17 $\alpha(\text{N})=0.0044$ 15; $\alpha(\text{O})=0.00063$ 18; $\alpha(\text{P})=2.3 \times 10^{-5}$ 8 ADO=0.85 0.16.
192.6 [‡] 3	11.6 15	5610.9	16 ⁻	5418.4	15 ⁻	M1+E2		0.28 4	$\alpha(\text{exp})=0.24$ 11 $\alpha(\text{K})=0.22$ 5; $\alpha(\text{L})=0.050$ 12; $\alpha(\text{M})=0.011$ 3; $\alpha(\text{N}+..)=0.0029$ 7 $\alpha(\text{N})=0.0025$ 7; $\alpha(\text{O})=0.00037$ 7; $\alpha(\text{P})=1.5 \times 10^{-5}$ 5 ADO=0.58 6 for 193.3+192.6. I_γ : for 193.3+192.6.
193.3 [@] 3	11.6 15	2535.1		2341.8	(7 ⁻)				
193.3 3	11.6 15	5183.9	14 ⁻	4990.6	13 ⁻	M1+E2	-0.2 1	0.35 10	$\alpha(\text{exp})=0.35$ 10 $\text{ce}(\text{K})/(\gamma+\text{ce})=0.17$ 3; $\text{ce}(\text{L})/(\gamma+\text{ce})=0.038$ 9; $\text{ce}(\text{M})/(\gamma+\text{ce})=0.0086$ 22; $\text{ce}(\text{N}+)/(\gamma+\text{ce})=0.0022$ 6 $\text{ce}(\text{N})/(\gamma+\text{ce})=0.0020$ 5; $\text{ce}(\text{O})/(\gamma+\text{ce})=0.00028$ 6; $\text{ce}(\text{P})/(\gamma+\text{ce})=1.2 \times 10^{-5}$ 4 $\alpha(\text{N})=0.0025$ 6; $\alpha(\text{O})=0.00036$ 7; $\alpha(\text{P})=1.5 \times 10^{-5}$ 5 $\alpha(\text{exp})$ deduced from intensity balance (2008Li08). I_γ : for 193.3+192.6. ADO=0.58 35. ADO=0.68 6 (2002Li22) for 193.3+192.6. DCO=2.4 3.

(HI,xn γ) [2008Li08,1997Su11](#) (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	$I_{(\gamma+ce)}$	Comments
208 [@]		5070.5	(14)	4862.5	(13)				
218 [@]		2753.1		2535.1					
222.0 3	0.8 1	4768.2	12 ⁻	4546.2	(11 ⁻)	M1+E2	0.19 3	3	ce(K)/($\gamma+ce$)=0.12 3; ce(L)/($\gamma+ce$)=0.025 4; ce(M)/($\gamma+ce$)=0.0057 10; ce(N+)/($\gamma+ce$)=0.00149 23 ce(N)/($\gamma+ce$)=0.00130 21; ce(O)/($\gamma+ce$)=0.000189 20; ce(P)/($\gamma+ce$)=8.E-6 3 $\alpha(N)$ =0.00154 25; $\alpha(O)$ =0.000224 23; $\alpha(P)$ = 1.0×10^{-5} 4 ADO=0.69 10 (2002Li22).
222.3 2	8.2 14	4990.6	13 ⁻	4768.2	12 ⁻	M1+E2	0.19 3	3	ce(K)/($\gamma+ce$)=0.12 3; ce(L)/($\gamma+ce$)=0.025 4; ce(M)/($\gamma+ce$)=0.0057 10; ce(N+)/($\gamma+ce$)=0.00149 23 ce(N)/($\gamma+ce$)=0.00129 21; ce(O)/($\gamma+ce$)=0.000188 20; ce(P)/($\gamma+ce$)=8.E-6 3 $\alpha(N)$ =0.00153 25; $\alpha(O)$ =0.000223 23; $\alpha(P)$ = 1.0×10^{-5} 4 ADO=0.61 10.
231 [@]		5301.5	(15)	5070.5	(14)				
231.0 2	0.7 1	8248.8	23 ⁺	8017.8	22 ⁺	M1+E2	0.17 3		$\alpha(K)$ =0.13 4; $\alpha(L)$ =0.026 4; $\alpha(M)$ =0.0059 9; $\alpha(N+..)$ =0.00155 20 $\alpha(N)$ =0.00134 19; $\alpha(O)$ =0.000196 16; $\alpha(P)$ =9.E-6 3 ADO=0.42 0.15.
234 [@]		3303.9		3069.6	(9 ⁻)				
234.5 [‡] 2	4.0 6	5418.4	15 ⁻	5183.9	14 ⁻	M1+E2	0.16 3		$\alpha(\text{exp})$ =0.24 11 $\alpha(K)$ =0.13 3; $\alpha(L)$ =0.025 3; $\alpha(M)$ =0.0056 8; $\alpha(N+..)$ =0.00147 18 $\alpha(N)$ =0.00127 17; $\alpha(O)$ =0.000186 14; $\alpha(P)$ =9.E-6 3 $\alpha(\text{exp})$ based on intensity balance (2008Li08). ADO=0.84 0.15.
242 [@]		5425.9	(15)	5183.9	14 ⁻				
261.4 2	3.5 6	5445.3	15 ⁻	5183.9	14 ⁻	M1+E2	0.115 23	3	ce(K)/($\gamma+ce$)=0.083 20; ce(L)/($\gamma+ce$)=0.0157 9; ce(M)/($\gamma+ce$)=0.0035 3; ce(N+)/($\gamma+ce$)=0.00092 6 ce(N)/($\gamma+ce$)=0.00079 6; ce(O)/($\gamma+ce$)=0.000117 4; ce(P)/($\gamma+ce$)= 5.8×10^{-6} 20 $\alpha(N)$ =0.00089 6; $\alpha(O)$ =0.000131 3; $\alpha(P)$ = 6.4×10^{-6} 23 ADO=0.66 10.
261.5 3	4.4 4	6477.3	18 ⁺	6215.7	17 ⁺	M1+E2	0.115 23	23	ce(K)/($\gamma+ce$)=0.083 20; ce(L)/($\gamma+ce$)=0.0156 9; ce(M)/($\gamma+ce$)=0.0035 3; ce(N+)/($\gamma+ce$)=0.00092 6 ce(N)/($\gamma+ce$)=0.00079 6; ce(O)/($\gamma+ce$)=0.000117 4; ce(P)/($\gamma+ce$)= 5.8×10^{-6} 20 $\alpha(N)$ =0.00089 6; $\alpha(O)$ =0.000130 3; $\alpha(P)$ = 6.4×10^{-6} 23 ADO=0.63 0.07, POL=-0.07 19.
264.0 3	1.5 2	6176.7	17 ⁺	5912.6	(16 ⁺)	(M1+E2)	0.112 23	3	ce(K)/($\gamma+ce$)=0.081 20; ce(L)/($\gamma+ce$)=0.0152 8; ce(M)/($\gamma+ce$)=0.00339 25; ce(N+)/($\gamma+ce$)=0.00089 5 ce(N)/($\gamma+ce$)=0.00077 5; ce(O)/($\gamma+ce$)=0.000114 3;

(HI,xn γ) 2008Li08,1997Su11 (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\delta^\#$	α^\dagger	$I_{(\gamma+ce)}$	Comments
285.6 2	17.0 8	5896.6	17 ⁻	5610.9	16 ⁻	M1(+E2)	-0.1 1	0.1086 19	9	ce(P)/($\gamma+ce$)=5.6 \times 10 ⁻⁶ 20 α (N)=0.00086 6; α (O)=0.0001265 23; α (P)=6.3 \times 10 ⁻⁶ 22 ADO=0.71 17. ce(K)/($\gamma+ce$)=0.0829 15; ce(L)/($\gamma+ce$)=0.01178 17; ce(M)/($\gamma+ce$)=0.00256 4; ce(N+)/($\gamma+ce$)=0.000686 10 ce(N)/($\gamma+ce$)=0.000588 9; ce(O)/($\gamma+ce$)=9.13 \times 10 ⁻⁵ 13; ce(P)/($\gamma+ce$)=6.12 \times 10 ⁻⁶ 13 α (N)=0.000652 10; α (O)=0.0001012 15; α (P)=6.79 \times 10 ⁻⁶ 14 B(M1)(W.u.)=(0.9 4); B(E2)(W.u.)=(70 +140-70) ADO=0.63 0.06 POL=-0.26 12 (2002Li22). ADO=0.65 6 (2002Li22).
295.1 2	8.7 4	6566.0	19 ⁻	6271.0	18 ⁻	M1(+E2)	-0.1 1	0.0995 18	8	ce(K)/($\gamma+ce$)=0.0766 14; ce(L)/($\gamma+ce$)=0.01087 16; ce(M)/($\gamma+ce$)=0.00236 4; ce(N+)/($\gamma+ce$)=0.000633 9 ce(N)/($\gamma+ce$)=0.000543 8; ce(O)/($\gamma+ce$)=8.43 \times 10 ⁻⁵ 13; ce(P)/($\gamma+ce$)=5.66 \times 10 ⁻⁶ 12 α (N)=0.000597 9; α (O)=9.27 \times 10 ⁻⁵ 14; α (P)=6.22 \times 10 ⁻⁶ 13 B(M1)(W.u.)=(0.50 +10-16); B(E2)(W.u.)=(30 +70-30) ADO=0.67 10, POL=-0.03 15.
300.7 2	5.0 5	6477.3	18 ⁺	6176.7	17 ⁺	M1+E2		0.077 18	18	ce(K)/($\gamma+ce$)=0.059 16; ce(L)/($\gamma+ce$)=0.0104 3; ce(M)/($\gamma+ce$)=0.00229 5; ce(N+)/($\gamma+ce$)=0.000605 16 ce(N)/($\gamma+ce$)=0.000523 12; ce(O)/($\gamma+ce$)=7.8 \times 10 ⁻⁵ 5; ce(P)/($\gamma+ce$)=4.1 \times 10 ⁻⁶ 15 α (N)=0.000564 9; α (O)=8.4 \times 10 ⁻⁵ 5; α (P)=4.4 \times 10 ⁻⁶ 16 ADO=0.52 9, POL=-0.07 19.
310.2 2	19.9 21	2341.8	(7 ⁻)	2031.7	5 ⁻	(E2)		0.0544		α (K)=0.0418 6; α (L)=0.00978 14; α (M)=0.00221 4; α (N+..)=0.000575 9
326.5 4	1.4 4	8963.3	24 ⁻	8636.9	23 ⁻	M1(+E2)	-0.1 1	0.0761 14		α (N)=0.000501 8; α (O)=7.13 \times 10 ⁻⁵ 11; α (P)=2.63 \times 10 ⁻⁶ 4 α (K)=0.0645 13; α (L)=0.00911 14; α (M)=0.00198 3; α (N+..)=0.000530 8 α (N)=0.000455 7; α (O)=7.06 \times 10 ⁻⁵ 11; α (P)=4.75 \times 10 ⁻⁶ 10 B(M1)(W.u.)=(0.26 +11-13); B(E2)(W.u.)=(10 +30-10) ADO=0.67 0.06.
333.8 2	0.5 1	6620.5	18 ⁻	6286.7	17 ⁻	M1+E2		0.058 15	5	ce(K)/($\gamma+ce$)=0.045 13; ce(L)/($\gamma+ce$)=0.0076 6; ce(M)/($\gamma+ce$)=0.00169 9; ce(N+)/($\gamma+ce$)=0.00045 3 ce(N)/($\gamma+ce$)=0.000385 22; ce(O)/($\gamma+ce$)=5.8 \times 10 ⁻⁵ 6; ce(P)/($\gamma+ce$)=3.1 \times 10 ⁻⁶ 11 α (N)=0.000407 23; α (O)=6.1 \times 10 ⁻⁵ 6; α (P)=3.3 \times 10 ⁻⁶ 12 ADO=0.67 0.05.
335 [@] 339.9 2	3.3 3	4785.6 2341.8	13 ⁻ (7 ⁻)	4450.7 2002.0	14 ⁺ 6 ⁺	(E1)		0.01168		α (K)=0.00994 14; α (L)=0.001368 20; α (M)=0.000295 5; α (N+..)=7.84 \times 10 ⁻⁵ 11 α (N)=6.75 \times 10 ⁻⁵ 10; α (O)=1.028 \times 10 ⁻⁵ 15; α (P)=6.39 \times 10 ⁻⁷ 9 α (K)=0.044 13; α (L)=0.0074 6; α (M)=0.00163 10;
343.8 2	4.7 7	8592.5	24 ⁺	8248.8	23 ⁺	M1+E2		0.053 14		

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(HI,xn γ) 2008Li08,1997Su11 (continued)

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\delta^\#$	α^\dagger	$I_{(\gamma+ce)}$	Comments
										$\alpha(\text{N+..})=0.00043\ 4$ $\alpha(\text{N})=0.000372\ 25$; $\alpha(\text{O})=5.6\times 10^{-5}\ 6$; $\alpha(\text{P})=3.1\times 10^{-6}\ 11$ ADO=0.58 0.09.
350.9 4	0.7 1	6477.3	18 ⁺	6126.5	18 ⁺					
354.5 3	0.8 1	8198.4	22 ⁻	7843.9	21 ⁻	M1+E2		0.049 13		$\alpha(\text{K})=0.040\ 12$; $\alpha(\text{L})=0.0067\ 6$; $\alpha(\text{M})=0.00148\ 11$; $\alpha(\text{N+..})=0.00039\ 4$
356.8 2	2.1 3	5540.8	15 ⁻	5183.9	14 ⁻	M1+E2		0.048 13	3	$\alpha(\text{N})=0.00034\ 3$; $\alpha(\text{O})=5.1\times 10^{-5}\ 6$; $\alpha(\text{P})=2.8\times 10^{-6}\ 10$ ce(K)/($\gamma+ce$)=0.038 11; ce(L)/($\gamma+ce$)=0.0063 6; ce(M)/($\gamma+ce$)=0.00139 11; ce(N+)/($\gamma+ce$)=0.00037 4 ce(N)/($\gamma+ce$)=0.00032 3; ce(O)/($\gamma+ce$)=4.8 $\times 10^{-5}$ 6; ce(P)/($\gamma+ce$)=2.7 $\times 10^{-6}$ 10
360.4 2	6.5 8	7645.4	21 ⁺	7285.1	20 ⁺	M1(+E2)	-0.1 1	0.0587 11	1	$\alpha(\text{N})=0.00033\ 3$; $\alpha(\text{O})=5.0\times 10^{-5}\ 6$; $\alpha(\text{P})=2.8\times 10^{-6}\ 10$ ce(K)/($\gamma+ce$)=0.0470 9; ce(L)/($\gamma+ce$)=0.00661 10; ce(M)/($\gamma+ce$)=0.001434 21; ce(N+)/($\gamma+ce$)=0.000385 6 ce(N)/($\gamma+ce$)=0.000330 5; ce(O)/($\gamma+ce$)=5.13 $\times 10^{-5}$ 8; ce(P)/($\gamma+ce$)=3.45 $\times 10^{-6}$ 8
367.4 3	0.9 1	6176.7	17 ⁺	5809.5	(16 ⁺)	(M1+E2)		0.044 12	2	$\alpha(\text{N})=0.000349\ 6$; $\alpha(\text{O})=5.43\times 10^{-5}\ 9$; $\alpha(\text{P})=3.66\times 10^{-6}\ 8$ B(M1)(W.u.)=(0.31 +8-9); B(E2)(W.u.)=(10 +30-10) ADO=0.61 05, POL=-0.33 18. ce(K)/($\gamma+ce$)=0.035 10; ce(L)/($\gamma+ce$)=0.0058 6; ce(M)/($\gamma+ce$)=0.00128 11; ce(N+)/($\gamma+ce$)=0.00034 4 ce(N)/($\gamma+ce$)=0.00029 3; ce(O)/($\gamma+ce$)=4.4 $\times 10^{-5}$ 6; ce(P)/($\gamma+ce$)=2.5 $\times 10^{-6}$ 9
367.7 2	1.1 2	5813.0	16 ⁻	5445.3	15 ⁻	M1+E2		0.044 12	2	$\alpha(\text{N})=0.00030\ 3$; $\alpha(\text{O})=4.6\times 10^{-5}\ 6$; $\alpha(\text{P})=2.6\times 10^{-6}\ 10$ ce(K)/($\gamma+ce$)=0.035 10; ce(L)/($\gamma+ce$)=0.0058 6; ce(M)/($\gamma+ce$)=0.00127 11; ce(N+)/($\gamma+ce$)=0.00034 4 ce(N)/($\gamma+ce$)=0.00029 3; ce(O)/($\gamma+ce$)=4.4 $\times 10^{-5}$ 6; ce(P)/($\gamma+ce$)=2.5 $\times 10^{-6}$ 9
372.3 3	1.5 2	8017.8	22 ⁺	7645.4	21 ⁺	M1+E2		0.043 12		$\alpha(\text{N})=0.00030\ 3$; $\alpha(\text{O})=4.6\times 10^{-5}\ 6$; $\alpha(\text{P})=2.6\times 10^{-6}\ 10$ ADO=0.60 05. $\alpha(\text{K})=0.035\ 11$; $\alpha(\text{L})=0.0058\ 7$; $\alpha(\text{M})=0.00128\ 12$; $\alpha(\text{N+..})=0.00034\ 4$
374.4 2	11.4 6	6271.0	18 ⁻	5896.6	17 ⁻	M1+E2		0.042 12	12	$\alpha(\text{N})=0.00029\ 3$; $\alpha(\text{O})=4.4\times 10^{-5}\ 6$; $\alpha(\text{P})=2.5\times 10^{-6}\ 9$ ADO=0.72 0.17. ce(K)/($\gamma+ce$)=0.033 10; ce(L)/($\gamma+ce$)=0.0055 6; ce(M)/($\gamma+ce$)=0.00121 12; ce(N+)/($\gamma+ce$)=0.00032 4 ce(N)/($\gamma+ce$)=0.00028 3; ce(O)/($\gamma+ce$)=4.2 $\times 10^{-5}$ 6; ce(P)/($\gamma+ce$)=2.4 $\times 10^{-6}$ 9
378.7 2	10.9 13	3136.7	(10 ⁺)	2757.8	8 ⁺	E2		0.0301		$\alpha(\text{N})=0.00029\ 3$; $\alpha(\text{O})=4.3\times 10^{-5}\ 6$; $\alpha(\text{P})=2.5\times 10^{-6}\ 9$ ADO=0.60 08 POL=-0.14 12. δ : -0.1 1 from ado=0.55 8 (2002Li22). $\alpha(\text{K})=0.0238\ 4$; $\alpha(\text{L})=0.00490\ 7$; $\alpha(\text{M})=0.001100\ 16$;

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(HI,xn γ) 2008Li08,1997Su11 (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\delta^\#$	α^\dagger	$I_{(\gamma+ce)}$	Comments
381.1 2	8.0 8	6858.4	19 ⁺	6477.3	18 ⁺	M1(+E2)	-0.1 1	0.0507 10		$\alpha(\text{N}+..)=0.000287 4$ $\alpha(\text{N})=0.000250 4$; $\alpha(\text{O})=3.62\times 10^{-5} 6$; $\alpha(\text{P})=1.543\times 10^{-6} 22$ $\text{B}(\text{M1})(\text{W.u.})=(0.9 +3-5)$; $\text{B}(\text{E2})(\text{W.u.})=(40 +80-40)$ $\alpha(\text{K})=0.0430 9$; $\alpha(\text{L})=0.00604 10$; $\alpha(\text{M})=0.001309 20$; $\alpha(\text{N}+..)=0.000351 6$
384.0 4	0.2 1	7455.0	(20 ⁻)	7071.0	19 ⁻	(M1+E2)		0.039 11	1	$\alpha(\text{N})=0.000301 5$; $\alpha(\text{O})=4.68\times 10^{-5} 8$; $\alpha(\text{P})=3.16\times 10^{-6} 7$ $\text{ADO}=0.84 11$, $\text{POL}=-0.12 15$. $\text{ce}(\text{K})/(\gamma+ce)=0.031 9$; $\text{ce}(\text{L})/(\gamma+ce)=0.0051 6$; $\text{ce}(\text{M})/(\gamma+ce)=0.00112 12$; $\text{ce}(\text{N}+)/(\gamma+ce)=0.00030 4$ $\text{ce}(\text{N})/(\gamma+ce)=0.00026 3$; $\text{ce}(\text{O})/(\gamma+ce)=3.9\times 10^{-5} 6$; $\text{ce}(\text{P})/(\gamma+ce)=2.2\times 10^{-6} 8$
384.4 6	0.6 1	9858.5	26 ⁻	9474.8	(25 ⁻)	M1(+E2)	-0.1 1	0.0496 10		$\alpha(\text{N})=0.00027 3$; $\alpha(\text{O})=4.0\times 10^{-5} 6$; $\alpha(\text{P})=2.3\times 10^{-6} 9$ $\alpha(\text{K})=0.0420 9$; $\alpha(\text{L})=0.00590 10$; $\alpha(\text{M})=0.001279 20$; $\alpha(\text{N}+..)=0.000343 6$
394.7 3	0.2 1	5813.0	16 ⁻	5418.4	15 ⁻	M1+E2		0.037 10		$\alpha(\text{N})=0.000294 5$; $\alpha(\text{O})=4.58\times 10^{-5} 8$; $\alpha(\text{P})=3.09\times 10^{-6} 7$ $\text{ADO}=0.63 0.06$. $\alpha(\text{K})=0.030 10$; $\alpha(\text{L})=0.0049 7$; $\alpha(\text{M})=0.00108 12$; $\alpha(\text{N}+..)=0.00029 4$
407.1 1	46.0 24	3164.9	10 ⁺	2757.8	8 ⁺	E2		0.0244		$\alpha(\text{N})=0.00025 3$; $\alpha(\text{O})=3.7\times 10^{-5} 6$; $\alpha(\text{P})=2.1\times 10^{-6} 8$ $\text{ADO}=0.50 0.07$. $\alpha(\text{K})=0.0195 3$; $\alpha(\text{L})=0.00386 6$; $\alpha(\text{M})=0.000864 13$; $\alpha(\text{N}+..)=0.000226 4$
410.4 6	0.9 3	9140.7	25 ⁺	8730.2	24 ⁺	M1+E2		0.033 9		$\alpha(\text{N})=0.000196 3$; $\alpha(\text{O})=2.86\times 10^{-5} 4$; $\alpha(\text{P})=1.278\times 10^{-6} 18$ $\text{Anisotropy} = 0.17 5$ consistent with E2 (1986Lu07). $\alpha(\text{K})=0.027 9$; $\alpha(\text{L})=0.0044 7$; $\alpha(\text{M})=0.00096 12$; $\alpha(\text{N}+..)=0.00026 4$
426.9 2	7.6 8	7285.1	20 ⁺	6858.4	19 ⁺	M1(+E2)	-0.1 1	0.0378 7	7	$\alpha(\text{N})=0.00022 3$; $\alpha(\text{O})=3.3\times 10^{-5} 6$; $\alpha(\text{P})=1.9\times 10^{-6} 7$ $\text{ce}(\text{K})/(\gamma+ce)=0.0309 6$; $\text{ce}(\text{L})/(\gamma+ce)=0.00432 7$; $\text{ce}(\text{M})/(\gamma+ce)=0.000936 15$; $\text{ce}(\text{N}+)/(\gamma+ce)=0.000251 4$ $\text{ce}(\text{N})/(\gamma+ce)=0.000215 4$; $\text{ce}(\text{O})/(\gamma+ce)=3.35\times 10^{-5} 6$; $\text{ce}(\text{P})/(\gamma+ce)=2.26\times 10^{-6} 5$
438.6 3	1.6 2	8636.9	23 ⁻	8198.4	22 ⁻	M1(+E2)	-0.1 1	0.0352 7		$\alpha(\text{N})=0.000224 4$; $\alpha(\text{O})=3.48\times 10^{-5} 6$; $\alpha(\text{P})=2.35\times 10^{-6} 5$ $\text{B}(\text{M1})(\text{W.u.})=(0.71 +20-28)$; $\text{B}(\text{E2})(\text{W.u.})=(20 +50-20)$ $\text{ADO}=0.65 07$, $\text{POL}=-0.03 16$. $\alpha(\text{K})=0.0299 6$; $\alpha(\text{L})=0.00418 7$; $\alpha(\text{M})=0.000905 15$; $\alpha(\text{N}+..)=0.000243 4$
450.5 4	0.4 1	7071.0	19 ⁻	6620.5	18 ⁻	M1+E2		0.026 8		$\alpha(\text{N})=0.000208 4$; $\alpha(\text{O})=3.24\times 10^{-5} 6$; $\alpha(\text{P})=2.19\times 10^{-6} 5$ $\text{B}(\text{M1})(\text{W.u.})=(0.16 6)$; $\text{B}(\text{E2})(\text{W.u.})=(5 +10-5)$ $\text{ADO}=0.70 0.06$. $\alpha(\text{K})=0.021 7$; $\alpha(\text{L})=0.0034 6$; $\alpha(\text{M})=0.00073 12$; $\alpha(\text{N}+..)=0.00020 4$
										$\alpha(\text{N})=0.00017 3$; $\alpha(\text{O})=2.6\times 10^{-5} 5$; $\alpha(\text{P})=1.5\times 10^{-6} 6$ $\text{ADO}=0.51 07$.

(HI,xn γ) 2008Li08,1997Su11 (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\delta^\#$	α^\dagger	$I_{(\gamma+ce)}$	Comments
466.4 2	3.5 4	7559.4	21 ⁻	7093.1	20 ⁻	M1+E2		0.023 7		$\alpha(\text{K})=0.020$ 6; $\alpha(\text{L})=0.0030$ 6; $\alpha(\text{M})=0.00067$ 11; $\alpha(\text{N+..})=0.00018$ 3 $\alpha(\text{N})=0.00015$ 3; $\alpha(\text{O})=2.3\times 10^{-5}$ 5; $\alpha(\text{P})=1.4\times 10^{-6}$ 5 ADO=0.52 6.
469.6 2	5.7 8	8248.8	23 ⁺	7779.3	22 ⁺	M1+E2		0.023 7		$\alpha(\text{K})=0.019$ 6; $\alpha(\text{L})=0.0030$ 6; $\alpha(\text{M})=0.00065$ 11; $\alpha(\text{N+..})=0.00017$ 3 $\alpha(\text{N})=0.00015$ 3; $\alpha(\text{O})=2.3\times 10^{-5}$ 5; $\alpha(\text{P})=1.4\times 10^{-6}$ 5 ADO=0.48 0.09.
473.7 2	0.7 2	6286.7	17 ⁻	5813.0	16 ⁻	M1+E2		0.023 7	7	$ce(\text{K})/(\gamma+ce)=0.018$ 6; $ce(\text{L})/(\gamma+ce)=0.0028$ 5; $ce(\text{M})/(\gamma+ce)=0.00062$ 11; $ce(\text{N+})/(\gamma+ce)=0.00017$ 3 $ce(\text{N})/(\gamma+ce)=0.000143$ 25; $ce(\text{O})/(\gamma+ce)=2.2\times 10^{-5}$ 5; $ce(\text{P})/(\gamma+ce)=1.3\times 10^{-6}$ 5 $\alpha(\text{N})=0.000146$ 25; $\alpha(\text{O})=2.2\times 10^{-5}$ 5; $\alpha(\text{P})=1.3\times 10^{-6}$ 5 ADO=0.72 0.07.
481.4 3	3.5 7	8730.2	24 ⁺	8248.8	23 ⁺	M1+E2		0.022 7		$\alpha(\text{K})=0.018$ 6; $\alpha(\text{L})=0.0028$ 5; $\alpha(\text{M})=0.00061$ 11; $\alpha(\text{N+..})=0.00016$ 3 $\alpha(\text{N})=0.000140$ 25; $\alpha(\text{O})=2.1\times 10^{-5}$ 5; $\alpha(\text{P})=1.3\times 10^{-6}$ 5 ADO=0.39 0.05.
502@ 511.3 4	1.2 3	6398.6 9474.8	(18) (25 ⁻)	5896.6 8963.3	17 ⁻ 24 ⁻	[E2]		0.01316		$\alpha(\text{K})=0.01072$ 16; $\alpha(\text{L})=0.00190$ 3; $\alpha(\text{M})=0.000422$ 6; $\alpha(\text{N+..})=0.0001111$ 16 $\alpha(\text{N})=9.62\times 10^{-5}$ 14; $\alpha(\text{O})=1.424\times 10^{-5}$ 21; $\alpha(\text{P})=7.20\times 10^{-7}$ 11 $\alpha(\text{K})=0.01053$ 15; $\alpha(\text{L})=0.00186$ 3; $\alpha(\text{M})=0.000413$ 6; $\alpha(\text{N+..})=0.0001088$ 16 $\alpha(\text{N})=9.41\times 10^{-5}$ 14; $\alpha(\text{O})=1.394\times 10^{-5}$ 20; $\alpha(\text{P})=7.08\times 10^{-7}$ 10 Anisotropy = 0.19 3 consistent with E2 (1986Lu07).
515.0 1	100.0	515.00	2 ⁺	0.0	0 ⁺	E2		0.01291		$\alpha(\text{K})=0.014$ 5; $\alpha(\text{L})=0.0022$ 5; $\alpha(\text{M})=0.00047$ 9; $\alpha(\text{N+..})=0.000127$ 25 $\alpha(\text{N})=0.000109$ 21; $\alpha(\text{O})=1.7\times 10^{-5}$ 4; $\alpha(\text{P})=1.0\times 10^{-6}$ 4 ADO=0.62 15, POL=0.00 18. δ : -0.1 1 from ADO=0.73 10 (2002Li22).
527.0 2	7.6 4	7093.1	20 ⁻	6566.0	19 ⁻	M1+E2		0.017 5		$\alpha(\text{K})=0.00916$ 13; $\alpha(\text{L})=0.001585$ 23; $\alpha(\text{M})=0.000350$ 5; $\alpha(\text{N+..})=9.24\times 10^{-5}$ 13 $\alpha(\text{N})=7.99\times 10^{-5}$ 12; $\alpha(\text{O})=1.188\times 10^{-5}$ 17; $\alpha(\text{P})=6.19\times 10^{-7}$ 9 ADO=1.28 04.
544.4 1	22.9 23	3709.3	12 ⁺	3164.9	10 ⁺	E2		0.01119		$\alpha(\text{K})=0.0170$ 3; $\alpha(\text{L})=0.00236$ 4; $\alpha(\text{M})=0.000510$ 8; $\alpha(\text{N+..})=0.0001369$ 20 $\alpha(\text{N})=0.0001173$ 17; $\alpha(\text{O})=1.83\times 10^{-5}$ 3; $\alpha(\text{P})=1.243\times 10^{-6}$ 19 B(M1)(W.u.)=(0.39 24) ADO=1.30 0.25.
548.3 4	2.3 8	9140.7	25 ⁺	8592.5	24 ⁺	M1(+E2)	0.0 1	0.0200		$\alpha(\text{K})=0.01617$ 24; $\alpha(\text{L})=0.00224$ 4; $\alpha(\text{M})=0.000484$ 7; $\alpha(\text{N+..})=0.0001299$ 19
559.6 4	2.0 4	9700.3	26 ⁺	9140.7	25 ⁺	M1(+E2)	0.0 1	0.0190		

(HL,xn γ) 2008Li08,1997Su11 (continued)

$\gamma(^{142}\text{Gd})$ (continued)										
E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\delta^\#$	α^\dagger	$I_{(\gamma+ce)}$	Comments
569.3 4	0.4 1	7596.9	(21 ⁺)	7027.7	19 ⁺	[E2]		0.00999 14		$\alpha(\text{N})=0.0001114$ 17; $\alpha(\text{O})=1.73\times 10^{-5}$ 3; $\alpha(\text{P})=1.180\times 10^{-6}$ 18 B(M1)(W.u.)=(0.6 4) ADO=0.85 0.10. $\alpha=0.00999$ 14; $\alpha(\text{K})=0.00821$ 12; $\alpha(\text{L})=0.001394$ 20; $\alpha(\text{M})=0.000308$ 5; $\alpha(\text{N}+..)=8.13\times 10^{-5}$ 12
591.7 2	10.0 13	3728.5	(12 ⁺)	3136.7	(10 ⁺)	(E2)		0.00907 13		$\alpha(\text{N})=7.03\times 10^{-5}$ 10; $\alpha(\text{O})=1.048\times 10^{-5}$ 15; $\alpha(\text{P})=5.56\times 10^{-7}$ 8 B(E2)(W.u.)=27 +10-11 $\alpha=0.00907$ 13; $\alpha(\text{K})=0.00747$ 11; $\alpha(\text{L})=0.001251$ 18; $\alpha(\text{M})=0.000276$ 4; $\alpha(\text{N}+..)=7.29\times 10^{-5}$ 11
603.1 2	5.9 4	2944.8	(8 ⁻)	2341.8	(7 ⁻)	M1+E2		0.012 4		$\alpha(\text{N})=6.30\times 10^{-5}$ 9; $\alpha(\text{O})=9.41\times 10^{-6}$ 14; $\alpha(\text{P})=5.08\times 10^{-7}$ 8 $\alpha(\text{K})=0.010$ 4; $\alpha(\text{L})=0.0015$ 4; $\alpha(\text{M})=0.00033$ 7; $\alpha(\text{N}+..)=8.8\times 10^{-5}$ 20
604.0 4	3.7 4	7779.3	22 ⁺	7175.3	(20 ⁺)	E2		0.00862 13		$\alpha(\text{N})=7.6\times 10^{-5}$ 17; $\alpha(\text{O})=1.2\times 10^{-5}$ 3; $\alpha(\text{P})=7.3\times 10^{-7}$ 25 ADO=0.47 10. $\alpha=0.00862$ 13; $\alpha(\text{K})=0.00711$ 10; $\alpha(\text{L})=0.001182$ 17; $\alpha(\text{M})=0.000260$ 4; $\alpha(\text{N}+..)=6.88\times 10^{-5}$ 10
611.4 2	1.6 5	10311.7	27 ⁺	9700.3	26 ⁺	M1(+E2)	0.0 1	0.01523 23	3	$\alpha(\text{N})=5.95\times 10^{-5}$ 9; $\alpha(\text{O})=8.90\times 10^{-6}$ 13; $\alpha(\text{P})=4.84\times 10^{-7}$ 7 ce(K)/($\gamma+ce$)=0.01276 19; ce(L)/($\gamma+ce$)=0.00176 3; ce(M)/($\gamma+ce$)=0.000381 6; ce(N+)/($\gamma+ce$)=0.0001022 15 ce(N)/($\gamma+ce$)=8.76 $\times 10^{-5}$ 13; ce(O)/($\gamma+ce$)=1.364 $\times 10^{-5}$ 20; ce(P)/($\gamma+ce$)=9.30 $\times 10^{-7}$ 14 $\alpha(\text{N})=8.89\times 10^{-5}$ 13; $\alpha(\text{O})=1.385\times 10^{-5}$ 21; $\alpha(\text{P})=9.44\times 10^{-7}$ 14 ADO=0.80 0.10.
627.4 4 627.8 3	1.2 1 0.4 2	5912.6 8159.4	(16 ⁺) (22 ⁺)	5285.0 7531.6	16 ⁺ (20 ⁺)	(E2)		0.00784 11		$\alpha=0.00784$ 11; $\alpha(\text{K})=0.00648$ 10; $\alpha(\text{L})=0.001063$ 15; $\alpha(\text{M})=0.000234$ 4; $\alpha(\text{N}+..)=6.19\times 10^{-5}$ 9
628.0 2	2.6 5	4466.4	13 ⁺	3838.5	11 ⁺	E2		0.00784 11		$\alpha(\text{N})=5.34\times 10^{-5}$ 8; $\alpha(\text{O})=8.02\times 10^{-6}$ 12; $\alpha(\text{P})=4.42\times 10^{-7}$ 7 $\alpha=0.00784$ 11; $\alpha(\text{K})=0.00648$ 9; $\alpha(\text{L})=0.001062$ 15; $\alpha(\text{M})=0.000234$ 4; $\alpha(\text{N}+..)=6.18\times 10^{-5}$ 9
638.9 3	1.1 3	8198.4	22 ⁻	7559.4	21 ⁻	M1+E2		0.011 3		$\alpha(\text{N})=5.34\times 10^{-5}$ 8; $\alpha(\text{O})=8.01\times 10^{-6}$ 12; $\alpha(\text{P})=4.42\times 10^{-7}$ 7 ADO=1.34 05. ADO=2.0 1 (2002Li22). $\alpha(\text{K})=0.009$ 3; $\alpha(\text{L})=0.0013$ 3; $\alpha(\text{M})=0.00028$ 7; $\alpha(\text{N}+..)=7.6\times 10^{-5}$ 17
650.3 2	14.1 14	3408.0	10 ⁺	2757.8	8 ⁺	E2		0.00720 11		$\alpha(\text{N})=6.5\times 10^{-5}$ 15; $\alpha(\text{O})=1.00\times 10^{-5}$ 24; $\alpha(\text{P})=6.4\times 10^{-7}$ 21 ADO=0.50 1.08. $\alpha=0.00720$ 11; $\alpha(\text{K})=0.00597$ 9; $\alpha(\text{L})=0.000967$ 14; $\alpha(\text{M})=0.000213$ 3; $\alpha(\text{N}+..)=5.63\times 10^{-5}$ 8
660.2 3	1.4 2	6271.0	18 ⁻	5610.9	16 ⁻	E2		0.00695 10		$\alpha(\text{N})=4.86\times 10^{-5}$ 7; $\alpha(\text{O})=7.30\times 10^{-6}$ 11; $\alpha(\text{P})=4.08\times 10^{-7}$ 6 ADO=1.30 07. $\alpha=0.00695$ 10; $\alpha(\text{K})=0.00576$ 8; $\alpha(\text{L})=0.000929$ 13; $\alpha(\text{M})=0.000204$ 3; $\alpha(\text{N}+..)=5.40\times 10^{-5}$ 8

(HI,xn γ) [2008Li08,1997Su11](#) (continued)

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
667.4 6	1.4 2	6477.3	18 ⁺	5809.5	(16 ⁺)	(E2)	0.00677 10	$\alpha(\text{N})=4.66\times 10^{-5}$ 7; $\alpha(\text{O})=7.01\times 10^{-6}$ 10; $\alpha(\text{P})=3.94\times 10^{-7}$ 6 B(E2)(W.u.)=14 5 $\alpha=0.00677$ 10; $\alpha(\text{K})=0.00562$ 8; $\alpha(\text{L})=0.000902$ 13; $\alpha(\text{M})=0.000198$ 3; $\alpha(\text{N}+..)=5.25\times 10^{-5}$ 8
669.3 2	3.2 3	6566.0	19 ⁻	5896.6	17 ⁻	E2	0.00673 10	$\alpha(\text{N})=4.53\times 10^{-5}$ 7; $\alpha(\text{O})=6.82\times 10^{-6}$ 10; $\alpha(\text{P})=3.84\times 10^{-7}$ 6 B(E2)(W.u.)=3.5 +10-12 $\alpha=0.00673$ 10; $\alpha(\text{K})=0.00558$ 8; $\alpha(\text{L})=0.000896$ 13; $\alpha(\text{M})=0.000197$ 3; $\alpha(\text{N}+..)=5.21\times 10^{-5}$ 8
673.7 5	3.7 4	3838.5	11 ⁺	3164.9	10 ⁺	M1+E2	0.009 3	$\alpha(\text{N})=4.50\times 10^{-5}$ 7; $\alpha(\text{O})=6.77\times 10^{-6}$ 10; $\alpha(\text{P})=3.82\times 10^{-7}$ 6 B(E2)(W.u.)=25 +6-9 $\alpha=0.009$ 3; $\alpha(\text{K})=0.0078$ 24; $\alpha(\text{L})=0.0011$ 3; $\alpha(\text{M})=0.00025$ 6; $\alpha(\text{N}+..)=6.6\times 10^{-5}$ 15 $\alpha(\text{N})=5.7\times 10^{-5}$ 13; $\alpha(\text{O})=8.7\times 10^{-6}$ 21; $\alpha(\text{P})=5.6\times 10^{-7}$ 19 ADO=0.41 13.
677.6 5	1.0 4	10989.3	(28 ⁺)	10311.7	27 ⁺	(M1+E2)	0.009 3	Additional information 2. $\alpha=0.009$ 3; $\alpha(\text{K})=0.0077$ 23; $\alpha(\text{L})=0.0011$ 3; $\alpha(\text{M})=0.00024$ 6; $\alpha(\text{N}+..)=6.5\times 10^{-5}$ 15
678.1 2	7.3 10	6282.9	(18 ⁺)	5604.7	(16 ⁺)	(E2)	0.00652 10	$\alpha(\text{N})=5.6\times 10^{-5}$ 13; $\alpha(\text{O})=8.6\times 10^{-6}$ 21; $\alpha(\text{P})=5.5\times 10^{-7}$ 18 $\alpha=0.00652$ 10; $\alpha(\text{K})=0.00542$ 8; $\alpha(\text{L})=0.000865$ 13; $\alpha(\text{M})=0.000190$ 3; $\alpha(\text{N}+..)=5.03\times 10^{-5}$ 7
679@ 680.5 2	3.8 6	5228.8 7596.9	(13) (21 ⁺)	4549.8 6916.3	(12) (20 ⁺)	M1+E2	0.009 3	$\alpha(\text{N})=4.34\times 10^{-5}$ 6; $\alpha(\text{O})=6.54\times 10^{-6}$ 10; $\alpha(\text{P})=3.71\times 10^{-7}$ 6 $\alpha=0.009$ 3; $\alpha(\text{K})=0.0077$ 23; $\alpha(\text{L})=0.0011$ 3; $\alpha(\text{M})=0.00024$ 6; $\alpha(\text{N}+..)=6.5\times 10^{-5}$ 15
682.1 4	0.2 1	6858.4	19 ⁺	6176.7	17 ⁺	(E2)	0.00643 9	$\alpha(\text{N})=5.5\times 10^{-5}$ 13; $\alpha(\text{O})=8.5\times 10^{-6}$ 21; $\alpha(\text{P})=5.5\times 10^{-7}$ 18 ADO=0.70 0.05. B(E2)(W.u.)=5 +3-4 $\alpha=0.00643$ 9; $\alpha(\text{K})=0.00534$ 8; $\alpha(\text{L})=0.000852$ 12; $\alpha(\text{M})=0.000187$ 3; $\alpha(\text{N}+..)=4.96\times 10^{-5}$ 7
693.6& 2	92& 11	1208.60	4 ⁺	515.00	2 ⁺	E2	0.00618 9	$\alpha(\text{N})=4.28\times 10^{-5}$ 6; $\alpha(\text{O})=6.44\times 10^{-6}$ 9; $\alpha(\text{P})=3.66\times 10^{-7}$ 6 $\alpha=0.00618$ 9; $\alpha(\text{K})=0.00514$ 8; $\alpha(\text{L})=0.000816$ 12; $\alpha(\text{M})=0.000179$ 3; $\alpha(\text{N}+..)=4.74\times 10^{-5}$ 7
693.6& 2	15&	4101.6	12 ⁺	3408.0	10 ⁺	E2	0.00618 9	$\alpha(\text{N})=4.09\times 10^{-5}$ 6; $\alpha(\text{O})=6.17\times 10^{-6}$ 9; $\alpha(\text{P})=3.52\times 10^{-7}$ 5 I_γ : 107 11 for doublet. From thickness arrows in Figure 1 2008LI08 , estimated 92 11 from 1209, 4 ⁺ level and 15 from 4102, 12 ⁺ level. Anisotropy = 0.19 4 consistent with E2 (1986Lu07).
708.7 5	1.4 2	7625.2	(21 ⁺)	6916.3	(20 ⁺)	(M1+E2)	0.0082 24	$\alpha=0.00618$ 9; $\alpha(\text{K})=0.00514$ 8; $\alpha(\text{L})=0.000816$ 12; $\alpha(\text{M})=0.000179$ 3; $\alpha(\text{N}+..)=4.74\times 10^{-5}$ 7 $\alpha(\text{N})=4.09\times 10^{-5}$ 6; $\alpha(\text{O})=6.17\times 10^{-6}$ 9; $\alpha(\text{P})=3.52\times 10^{-7}$ 5 Anisotropy = 0.18 3 consistent with E2 (1986Lu07).
								$\alpha=0.0082$ 24; $\alpha(\text{K})=0.0069$ 21; $\alpha(\text{L})=0.00100$ 24; $\alpha(\text{M})=0.00022$ 5;

(HI,xn γ) 2008Li08,1997Su11 (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
								$\alpha(\text{N+..})=5.8\times 10^{-5}$ 14 $\alpha(\text{N})=5.0\times 10^{-5}$ 12; $\alpha(\text{O})=7.7\times 10^{-6}$ 19; $\alpha(\text{P})=4.9\times 10^{-7}$ 16
715 @		5614.2	(16 ⁺)	4899.2	(14 ⁺)			
717 @ 1		4785.6	13 ⁻	4068.2	(12 ⁻)			
718.7 5	10.9 2	3788.3	(10 ⁻)	3069.6	(9 ⁻)	M1+E2	0.0079 23	$\alpha=0.0079$ 23; $\alpha(\text{K})=0.0067$ 20; $\alpha(\text{L})=0.00097$ 23; $\alpha(\text{M})=0.00021$ 5; $\alpha(\text{N+..})=5.6\times 10^{-5}$ 13 $\alpha(\text{N})=4.8\times 10^{-5}$ 11; $\alpha(\text{O})=7.4\times 10^{-6}$ 18; $\alpha(\text{P})=4.8\times 10^{-7}$ 16 $\alpha=0.00553$ 8; $\alpha(\text{K})=0.00461$ 7; $\alpha(\text{L})=0.000720$ 10; $\alpha(\text{M})=0.0001578$ 23; $\alpha(\text{N+..})=4.19\times 10^{-5}$ 6 $\alpha(\text{N})=3.61\times 10^{-5}$ 5; $\alpha(\text{O})=5.46\times 10^{-6}$ 8; $\alpha(\text{P})=3.17\times 10^{-7}$ 5 ADO=1.36 15.
727.8 2	12.7 9	3069.6	(9 ⁻)	2341.8	(7 ⁻)	E2	0.00553 8	
731.2 3	4.5 7	8328.1	(23 ⁺)	7596.9	(21 ⁺)	(E2)	0.00547 8	B(E2)(W.u.)=106 22 $\alpha=0.00547$ 8; $\alpha(\text{K})=0.00456$ 7; $\alpha(\text{L})=0.000712$ 10; $\alpha(\text{M})=0.0001560$ 22; $\alpha(\text{N+..})=4.14\times 10^{-5}$ 6 $\alpha(\text{N})=3.57\times 10^{-5}$ 5; $\alpha(\text{O})=5.39\times 10^{-6}$ 8; $\alpha(\text{P})=3.13\times 10^{-7}$ 5 $\alpha=0.0076$ 22; $\alpha(\text{K})=0.0064$ 19; $\alpha(\text{L})=0.00092$ 22; $\alpha(\text{M})=0.00020$ 5; $\alpha(\text{N+..})=5.4\times 10^{-5}$ 13 $\alpha(\text{N})=4.6\times 10^{-5}$ 11; $\alpha(\text{O})=7.1\times 10^{-6}$ 18; $\alpha(\text{P})=4.6\times 10^{-7}$ 15 $\alpha=0.0074$ 21; $\alpha(\text{K})=0.0062$ 19; $\alpha(\text{L})=0.00090$ 21; $\alpha(\text{M})=0.00019$ 5; $\alpha(\text{N+..})=5.2\times 10^{-5}$ 12 $\alpha(\text{N})=4.5\times 10^{-5}$ 11; $\alpha(\text{O})=6.9\times 10^{-6}$ 17; $\alpha(\text{P})=4.4\times 10^{-7}$ 14 B(E2)(W.u.)=55 +7-9 $\alpha=0.00530$ 8; $\alpha(\text{K})=0.00442$ 7; $\alpha(\text{L})=0.000687$ 10; $\alpha(\text{M})=0.0001505$ 21; $\alpha(\text{N+..})=3.99\times 10^{-5}$ 6 $\alpha(\text{N})=3.44\times 10^{-5}$ 5; $\alpha(\text{O})=5.21\times 10^{-6}$ 8; $\alpha(\text{P})=3.04\times 10^{-7}$ 5 ADO=1.34 05.
731.9 5	0.9 1	6858.4	19 ⁺	6126.5	18 ⁺	(M1+E2)	0.0076 22	
741.2 5	0.9 2	8568.0	(23 ⁺)	7826.9	(22 ⁺)	(M1+E2)	0.0074 21	
741.4 2	31.9 16	4450.7	14 ⁺	3709.3	12 ⁺	E2	0.00530 8	
746 @		5638.6	(16 ⁺)	4892.6	(14 ⁺)			
750.7 6	0.9 1	7843.9	21 ⁻	7093.1	20 ⁻	(M1+E2)	0.0072 20	$\alpha=0.0072$ 20; $\alpha(\text{K})=0.0060$ 18; $\alpha(\text{L})=0.00087$ 21; $\alpha(\text{M})=0.00019$ 5; $\alpha(\text{N+..})=5.0\times 10^{-5}$ 12 $\alpha(\text{N})=4.3\times 10^{-5}$ 10; $\alpha(\text{O})=6.7\times 10^{-6}$ 17; $\alpha(\text{P})=4.3\times 10^{-7}$ 14 $\alpha=0.00508$ 8; $\alpha(\text{K})=0.00424$ 6; $\alpha(\text{L})=0.000656$ 10; $\alpha(\text{M})=0.0001435$ 21; $\alpha(\text{N+..})=3.81\times 10^{-5}$ 6 $\alpha(\text{N})=3.28\times 10^{-5}$ 5; $\alpha(\text{O})=4.97\times 10^{-6}$ 7; $\alpha(\text{P})=2.92\times 10^{-7}$ 4 ADO=1.10 26. $\alpha=0.00507$ 8; $\alpha(\text{K})=0.00424$ 6; $\alpha(\text{L})=0.000655$ 10; $\alpha(\text{M})=0.0001434$ 20; $\alpha(\text{N+..})=3.81\times 10^{-5}$ 6 $\alpha(\text{N})=3.28\times 10^{-5}$ 5; $\alpha(\text{O})=4.97\times 10^{-6}$ 7; $\alpha(\text{P})=2.91\times 10^{-7}$ 4 Anisotropy = 0.17 4 consistent with E2 (1986Lu07).
755.3 2	6.5 5	5540.8	15 ⁻	4785.6	13 ⁻	E2	0.00508 8	
755.6 2	69.0 8	2757.8	8 ⁺	2002.0	6 ⁺	E2	0.00507 8	
757.0 4	4.9 8	4466.4	13 ⁺	3709.3	12 ⁺	(M1+E2)	0.0070 20	$\alpha=0.0070$ 20; $\alpha(\text{K})=0.0059$ 18; $\alpha(\text{L})=0.00085$ 20; $\alpha(\text{M})=0.00018$ 5; $\alpha(\text{N+..})=4.9\times 10^{-5}$ 12 $\alpha(\text{N})=4.2\times 10^{-5}$ 10; $\alpha(\text{O})=6.5\times 10^{-6}$ 16; $\alpha(\text{P})=4.2\times 10^{-7}$ 14

(HI,xn γ) **2008Li08,1997Su11** (continued)

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
764 @ 764.6 3	2.6 6	4068.2 8963.3	(12 ⁻) 24 ⁻	3303.9 8198.4				
						E2	0.00494 7	$\alpha=0.00494$ 7; $\alpha(\text{K})=0.00413$ 6; $\alpha(\text{L})=0.000636$ 9; $\alpha(\text{M})=0.0001392$ 20; $\alpha(\text{N}+..)=3.70\times 10^{-5}$ 6 $\alpha(\text{N})=3.18\times 10^{-5}$ 5; $\alpha(\text{O})=4.83\times 10^{-6}$ 7; $\alpha(\text{P})=2.84\times 10^{-7}$ 4 B(E2)(W.u.)=38 +15-17 ADO=1.2 0.3.
776 @ 787.4 6	0.5 1	5325.8 7645.4	(14) 21 ⁺	4549.8 6858.4	(12) 19 ⁺			
						E2	0.00462 7	$\alpha=0.00462$ 7; $\alpha(\text{K})=0.00387$ 6; $\alpha(\text{L})=0.000591$ 9; $\alpha(\text{M})=0.0001292$ 19; $\alpha(\text{N}+..)=3.43\times 10^{-5}$ 5 $\alpha(\text{N})=2.96\times 10^{-5}$ 5; $\alpha(\text{O})=4.49\times 10^{-6}$ 7; $\alpha(\text{P})=2.66\times 10^{-7}$ 4 B(E2)(W.u.)=15 +5-6
789.8 3	12.3 8	6916.3	(20 ⁺)	6126.5	18 ⁺	(E2)	0.00459 7	B(E2)(W.u.)=85 +9-13 $\alpha=0.00459$ 7; $\alpha(\text{K})=0.00384$ 6; $\alpha(\text{L})=0.000587$ 9; $\alpha(\text{M})=0.0001283$ 18; $\alpha(\text{N}+..)=3.41\times 10^{-5}$ 5 $\alpha(\text{N})=2.94\times 10^{-5}$ 5; $\alpha(\text{O})=4.46\times 10^{-6}$ 7; $\alpha(\text{P})=2.65\times 10^{-7}$ 4
791 @ 792.3 10	1.5 6	4892.6 8636.9	(14 ⁺) 23 ⁻	4101.6 7843.9	12 ⁺ 21 ⁻	[E2]	0.00456 7	$\alpha=0.00456$ 7; $\alpha(\text{K})=0.00381$ 6; $\alpha(\text{L})=0.000582$ 9; $\alpha(\text{M})=0.0001273$ 19; $\alpha(\text{N}+..)=3.38\times 10^{-5}$ 5 $\alpha(\text{N})=2.91\times 10^{-5}$ 5; $\alpha(\text{O})=4.42\times 10^{-6}$ 7; $\alpha(\text{P})=2.63\times 10^{-7}$ 4 B(E2)(W.u.)=24 +12-13
793.3 2	74 11	2002.0	6 ⁺	1208.60	4 ⁺	E2	0.00454 7	$\alpha=0.00454$ 7; $\alpha(\text{K})=0.00380$ 6; $\alpha(\text{L})=0.000580$ 9; $\alpha(\text{M})=0.0001269$ 18; $\alpha(\text{N}+..)=3.37\times 10^{-5}$ 5 $\alpha(\text{N})=2.90\times 10^{-5}$ 4; $\alpha(\text{O})=4.41\times 10^{-6}$ 7; $\alpha(\text{P})=2.62\times 10^{-7}$ 4 Anisotropy = 0.19 4 consistent with E2 (1986Lu07).
797.8 3	9.2 8	4899.2	(14 ⁺)	4101.6	12 ⁺	E2	0.00449 7	B(E2)(W.u.)=25 +5-7 $\alpha=0.00449$ 7; $\alpha(\text{K})=0.00376$ 6; $\alpha(\text{L})=0.000572$ 8; $\alpha(\text{M})=0.0001251$ 18; $\alpha(\text{N}+..)=3.32\times 10^{-5}$ 5 $\alpha(\text{N})=2.86\times 10^{-5}$ 4; $\alpha(\text{O})=4.35\times 10^{-6}$ 6; $\alpha(\text{P})=2.59\times 10^{-7}$ 4 ADO=1.30 0.25.
800 @ 805 @ 807.6 7	0.4 1	4549.8 3749.8 7285.1	(12) 10 20 ⁺	3749.8 2944.8 6477.3	10 (8 ⁻) 18 ⁺			
						(E2)	0.00437 7	$\alpha=0.00437$ 7; $\alpha(\text{K})=0.00366$ 6; $\alpha(\text{L})=0.000556$ 8; $\alpha(\text{M})=0.0001214$ 18; $\alpha(\text{N}+..)=3.23\times 10^{-5}$ 5 $\alpha(\text{N})=2.78\times 10^{-5}$ 4; $\alpha(\text{O})=4.22\times 10^{-6}$ 6; $\alpha(\text{P})=2.52\times 10^{-7}$ 4 B(E2)(W.u.)=5.6 +21-26
811.9 3	6.7 10	5278.2	15 ⁺	4466.4	13 ⁺	E2	0.00431 6	$\alpha=0.00431$ 6; $\alpha(\text{K})=0.00361$ 5; $\alpha(\text{L})=0.000548$ 8; $\alpha(\text{M})=0.0001198$ 17; $\alpha(\text{N}+..)=3.18\times 10^{-5}$ 5 $\alpha(\text{N})=2.74\times 10^{-5}$ 4; $\alpha(\text{O})=4.17\times 10^{-6}$ 6; $\alpha(\text{P})=2.49\times 10^{-7}$ 4 ADO=1.34 10.
812.9 3	2.1 3	8592.5	24 ⁺	7779.3	22 ⁺	[E2]	0.00430 6	$\alpha=0.00430$ 6; $\alpha(\text{K})=0.00360$ 5; $\alpha(\text{L})=0.000547$ 8; $\alpha(\text{M})=0.0001194$ 17;

(HI,xn γ) 2008Li08,1997Su11 (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
822.3 4	0.9 2	7093.1	20 ⁻	6271.0	18 ⁻	E2	0.00419 6	$\alpha(\text{N}+..)=3.17\times 10^{-5}$ 5 $\alpha(\text{N})=2.73\times 10^{-5}$ 4; $\alpha(\text{O})=4.15\times 10^{-6}$ 6; $\alpha(\text{P})=2.49\times 10^{-7}$ 4 B(E2)(W.u.)=25 8 $\alpha=0.00419$ 6; $\alpha(\text{K})=0.00352$ 5; $\alpha(\text{L})=0.000532$ 8; $\alpha(\text{M})=0.0001161$ 17; $\alpha(\text{N}+..)=3.09\times 10^{-5}$ 5
823.2 2	22.8 23	2031.7	5 ⁻	1208.60	4 ⁺	E1	0.001650 24	$\alpha(\text{N})=2.66\times 10^{-5}$ 4; $\alpha(\text{O})=4.04\times 10^{-6}$ 6; $\alpha(\text{P})=2.42\times 10^{-7}$ 4 B(E2)(W.u.)=8 3 $\alpha=0.001650$ 24; $\alpha(\text{K})=0.001413$ 20; $\alpha(\text{L})=0.000186$ 3; $\alpha(\text{M})=4.00\times 10^{-5}$ 6; $\alpha(\text{N}+..)=1.069\times 10^{-5}$ 1
825.7 2	8.5 11	5604.7	(16 ⁺)	4778.9	(14 ⁺)	E2	0.00416 6	$\alpha(\text{N})=9.17\times 10^{-6}$ 13; $\alpha(\text{O})=1.418\times 10^{-6}$ 20; $\alpha(\text{P})=9.46\times 10^{-8}$ 14 ADO=1.01 10 for 823 transition (stretched E1). B(E2)(W.u.)=19 +6-8 $\alpha=0.00416$ 6; $\alpha(\text{K})=0.00348$ 5; $\alpha(\text{L})=0.000526$ 8; $\alpha(\text{M})=0.0001149$ 17; $\alpha(\text{N}+..)=3.06\times 10^{-5}$ 5
828.1 9	2.3 2	5278.2	15 ⁺	4450.7	14 ⁺	M1+E2	0.0057 16	$\alpha(\text{N})=2.63\times 10^{-5}$ 4; $\alpha(\text{O})=4.00\times 10^{-6}$ 6; $\alpha(\text{P})=2.40\times 10^{-7}$ 4 $\alpha=0.0057$ 16; $\alpha(\text{K})=0.0048$ 14; $\alpha(\text{L})=0.00068$ 16; $\alpha(\text{M})=0.00015$ 4; $\alpha(\text{N}+..)=3.9\times 10^{-5}$ 10
828.4 4	0.9 1	4768.2	12 ⁻	3939.7	11 ⁻	M1+E2	0.0057 16	$\alpha(\text{N})=3.4\times 10^{-5}$ 8; $\alpha(\text{O})=5.2\times 10^{-6}$ 13; $\alpha(\text{P})=3.4\times 10^{-7}$ 11 ADO=0.72 0.05. $\delta: -0.2$ 2 from ADO=0.58 14 (2002Li22). $\alpha=0.0057$ 16; $\alpha(\text{K})=0.0048$ 14; $\alpha(\text{L})=0.00068$ 16; $\alpha(\text{M})=0.00015$ 4; $\alpha(\text{N}+..)=3.9\times 10^{-5}$ 10
834.3 2	27.5 20	5285.0	16 ⁺	4450.7	14 ⁺	E2	0.00406 6	$\alpha(\text{N})=3.4\times 10^{-5}$ 8; $\alpha(\text{O})=5.2\times 10^{-6}$ 13; $\alpha(\text{P})=3.4\times 10^{-7}$ 11 B(E2)(W.u.)=91 +13-19 $\alpha=0.00406$ 6; $\alpha(\text{K})=0.00341$ 5; $\alpha(\text{L})=0.000513$ 8; $\alpha(\text{M})=0.0001120$ 16; $\alpha(\text{N}+..)=2.98\times 10^{-5}$ 5
838.2 3	1.0 3	9474.8	(25 ⁻)	8636.9	23 ⁻	[E2]	0.00402 6	$\alpha(\text{N})=2.57\times 10^{-5}$ 4; $\alpha(\text{O})=3.90\times 10^{-6}$ 6; $\alpha(\text{P})=2.35\times 10^{-7}$ 4 ADO=1.31 06. $\alpha=0.00402$ 6; $\alpha(\text{K})=0.00337$ 5; $\alpha(\text{L})=0.000508$ 8; $\alpha(\text{M})=0.0001108$ 16; $\alpha(\text{N}+..)=2.95\times 10^{-5}$ 5
841.5 2	18.6 14	6126.5	18 ⁺	5285.0	16 ⁺	E2	0.00399 6	$\alpha(\text{N})=2.54\times 10^{-5}$ 4; $\alpha(\text{O})=3.86\times 10^{-6}$ 6; $\alpha(\text{P})=2.33\times 10^{-7}$ 4 B(E2)(W.u.)=80 13 $\alpha=0.00399$ 6; $\alpha(\text{K})=0.00334$ 5; $\alpha(\text{L})=0.000503$ 7; $\alpha(\text{M})=0.0001097$ 16; $\alpha(\text{N}+..)=2.92\times 10^{-5}$ 4
843.6 2	3.6 3	3788.3	(10 ⁻)	2944.8	(8 ⁻)	E2	0.00396 6	$\alpha(\text{N})=2.51\times 10^{-5}$ 4; $\alpha(\text{O})=3.82\times 10^{-6}$ 6; $\alpha(\text{P})=2.31\times 10^{-7}$ 4 ADO=1.24 0.06. $\alpha=0.00396$ 6; $\alpha(\text{K})=0.00333$ 5; $\alpha(\text{L})=0.000500$ 7; $\alpha(\text{M})=0.0001091$ 16; $\alpha(\text{N}+..)=2.90\times 10^{-5}$ 4
845.9 2	6.6 7	4785.6	13 ⁻	3939.7	11 ⁻	E2	0.00394 6	$\alpha(\text{N})=2.50\times 10^{-5}$ 4; $\alpha(\text{O})=3.80\times 10^{-6}$ 6; $\alpha(\text{P})=2.30\times 10^{-7}$ 4 ADO=1.31 06. $\alpha=0.00394$ 6; $\alpha(\text{K})=0.00331$ 5; $\alpha(\text{L})=0.000497$ 7; $\alpha(\text{M})=0.0001083$ 16; $\alpha(\text{N}+..)=2.88\times 10^{-5}$ 4

(HI,xn γ) 2008Li08,1997Su11 (continued)

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
870.2 2	7.6 5	3939.7	11 ⁻	3069.6	(9 ⁻)	E2	0.00370 6	$\alpha(\text{N})=2.48\times 10^{-5}$ 4; $\alpha(\text{O})=3.78\times 10^{-6}$ 6; $\alpha(\text{P})=2.28\times 10^{-7}$ 4 ADO=1.8 0.4. $\alpha=0.00370$ 6; $\alpha(\text{K})=0.00311$ 5; $\alpha(\text{L})=0.000464$ 7; $\alpha(\text{M})=0.0001012$ 15; $\alpha(\text{N}+..)=2.69\times 10^{-5}$ 4 $\alpha(\text{N})=2.32\times 10^{-5}$ 4; $\alpha(\text{O})=3.53\times 10^{-6}$ 5; $\alpha(\text{P})=2.15\times 10^{-7}$ 3 ADO=1.46 28.
877.3 4	2.4 8	7137.4	20 ⁺	6260.1	(18 ⁺)	(E2)	0.00364 6	$\alpha=0.00364$ 6; $\alpha(\text{K})=0.00306$ 5; $\alpha(\text{L})=0.000455$ 7; $\alpha(\text{M})=9.92\times 10^{-5}$ 14; $\alpha(\text{N}+..)=2.64\times 10^{-5}$ 4 $\alpha(\text{N})=2.27\times 10^{-5}$ 4; $\alpha(\text{O})=3.47\times 10^{-6}$ 5; $\alpha(\text{P})=2.11\times 10^{-7}$ 3
879.8 6	1.2 3	10102.4	(26 ⁺)	9222.6	(24 ⁺)	(E2)	0.00362 5	$\alpha=0.00362$ 5; $\alpha(\text{K})=0.00304$ 5; $\alpha(\text{L})=0.000452$ 7; $\alpha(\text{M})=9.86\times 10^{-5}$ 14; $\alpha(\text{N}+..)=2.62\times 10^{-5}$ 4 $\alpha(\text{N})=2.26\times 10^{-5}$ 4; $\alpha(\text{O})=3.44\times 10^{-6}$ 5; $\alpha(\text{P})=2.10\times 10^{-7}$ 3
892.0 3	0.9 1	6176.7	17 ⁺	5285.0	16 ⁺	(M1+E2)	0.0048 13	$\alpha=0.0048$ 13; $\alpha(\text{K})=0.0040$ 11; $\alpha(\text{L})=0.00057$ 13; $\alpha(\text{M})=0.00012$ 3; $\alpha(\text{N}+..)=3.3\times 10^{-5}$ 8 $\alpha(\text{N})=2.8\times 10^{-5}$ 7; $\alpha(\text{O})=4.4\times 10^{-6}$ 11; $\alpha(\text{P})=2.9\times 10^{-7}$ 9
892.4 2	5.0 6	7175.3	(20 ⁺)	6282.9	(18 ⁺)	(E2)	0.00351 5	B(E2)(W.u.)=19 4 $\alpha=0.00351$ 5; $\alpha(\text{K})=0.00295$ 5; $\alpha(\text{L})=0.000437$ 7; $\alpha(\text{M})=9.53\times 10^{-5}$ 14; $\alpha(\text{N}+..)=2.54\times 10^{-5}$ 4 $\alpha(\text{N})=2.18\times 10^{-5}$ 3; $\alpha(\text{O})=3.33\times 10^{-6}$ 5; $\alpha(\text{P})=2.04\times 10^{-7}$ 3
895.0 3	1.8 2	9858.5	26 ⁻	8963.3	24 ⁻	E2	0.00348 5	$\alpha=0.00348$ 5; $\alpha(\text{K})=0.00293$ 5; $\alpha(\text{L})=0.000434$ 6; $\alpha(\text{M})=9.46\times 10^{-5}$ 14; $\alpha(\text{N}+..)=2.52\times 10^{-5}$ 4 $\alpha(\text{N})=2.17\times 10^{-5}$ 3; $\alpha(\text{O})=3.31\times 10^{-6}$ 5; $\alpha(\text{P})=2.03\times 10^{-7}$ 3 ADO=1.31 0.10.
898.6 2	5.6 6	6176.7	17 ⁺	5278.2	15 ⁺	E2	0.00345 5	$\alpha=0.00345$ 5; $\alpha(\text{K})=0.00291$ 4; $\alpha(\text{L})=0.000430$ 6; $\alpha(\text{M})=9.37\times 10^{-5}$ 14; $\alpha(\text{N}+..)=2.50\times 10^{-5}$ 4 $\alpha(\text{N})=2.15\times 10^{-5}$ 3; $\alpha(\text{O})=3.28\times 10^{-6}$ 5; $\alpha(\text{P})=2.01\times 10^{-7}$ 3 B(E2)(W.u.)=7.1 +21-30 ADO=1.26 06 ADO=1.39 10 (2002Li22).
901.5 5	1.1 2	7027.7	19 ⁺	6126.5	18 ⁺	M1+E2	0.0046 13	$\alpha=0.0046$ 13; $\alpha(\text{K})=0.0039$ 11; $\alpha(\text{L})=0.00055$ 13; $\alpha(\text{M})=0.00012$ 3; $\alpha(\text{N}+..)=3.2\times 10^{-5}$ 8 $\alpha(\text{N})=2.8\times 10^{-5}$ 7; $\alpha(\text{O})=4.3\times 10^{-6}$ 11; $\alpha(\text{P})=2.8\times 10^{-7}$ 9 ADO=0.69 05.
910.3 2	1.9 2	5809.5	(16 ⁺)	4899.2	(14 ⁺)	(E2)	0.00336 5	B(E2)(W.u.)=37 +12-17 $\alpha=0.00336$ 5; $\alpha(\text{K})=0.00283$ 4; $\alpha(\text{L})=0.000417$ 6; $\alpha(\text{M})=9.09\times 10^{-5}$ 13; $\alpha(\text{N}+..)=2.42\times 10^{-5}$ 4 $\alpha(\text{N})=2.08\times 10^{-5}$ 3; $\alpha(\text{O})=3.18\times 10^{-6}$ 5; $\alpha(\text{P})=1.95\times 10^{-7}$ 3
910.6 2	7.3 9	7826.9	(22 ⁺)	6916.3	(20 ⁺)	E2	0.00336 5	B(E2)(W.u.)=79 16 $\alpha=0.00336$ 5; $\alpha(\text{K})=0.00283$ 4; $\alpha(\text{L})=0.000417$ 6; $\alpha(\text{M})=9.08\times 10^{-5}$ 13; $\alpha(\text{N}+..)=2.42\times 10^{-5}$ 4 $\alpha(\text{N})=2.08\times 10^{-5}$ 3; $\alpha(\text{O})=3.18\times 10^{-6}$ 5; $\alpha(\text{P})=1.95\times 10^{-7}$ 3 ADO=1.29 0.14.
929.4 6	2.2 2	4768.2	12 ⁻	3838.5	11 ⁺	E1	0.001304 19	$\alpha=0.001304$ 19; $\alpha(\text{K})=0.001118$ 16; $\alpha(\text{L})=0.0001464$ 21; $\alpha(\text{M})=3.14\times 10^{-5}$ 5;

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
937.4 4	4.6 5	6215.7	17 ⁺	5278.2	15 ⁺	E2	0.00316 5	$\alpha(\text{N}+\dots)=8.41\times 10^{-6}$ $\alpha(\text{N})=7.22\times 10^{-6}$ 11; $\alpha(\text{O})=1.118\times 10^{-6}$ 16; $\alpha(\text{P})=7.50\times 10^{-8}$ 11 ADO=0.89 40. $\alpha=0.00316$ 5; $\alpha(\text{K})=0.00266$ 4; $\alpha(\text{L})=0.000390$ 6; $\alpha(\text{M})=8.49\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.26\times 10^{-5}$ 4 $\alpha(\text{N})=1.94\times 10^{-5}$ 3; $\alpha(\text{O})=2.97\times 10^{-6}$ 5; $\alpha(\text{P})=1.84\times 10^{-7}$ 3 ADO=1.27 05.
939.7 2	3.0 5	9746.8	(26 ⁺)	8807.1	24 ⁺	E2	0.00314 5	B(E2)(W.u.)=57 13 $\alpha=0.00314$ 5; $\alpha(\text{K})=0.00264$ 4; $\alpha(\text{L})=0.000388$ 6; $\alpha(\text{M})=8.44\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.25\times 10^{-5}$ 4 $\alpha(\text{N})=1.93\times 10^{-5}$ 3; $\alpha(\text{O})=2.96\times 10^{-6}$ 5; $\alpha(\text{P})=1.83\times 10^{-7}$ 3 ADO=1.25 0.05.
942.8 3	1.5 2	8568.0	(23 ⁺)	7625.2	(21 ⁺)	(E2)	0.00312 5	$\alpha=0.00312$ 5; $\alpha(\text{K})=0.00263$ 4; $\alpha(\text{L})=0.000385$ 6; $\alpha(\text{M})=8.37\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.23\times 10^{-5}$ 4 $\alpha(\text{N})=1.92\times 10^{-5}$ 3; $\alpha(\text{O})=2.93\times 10^{-6}$ 5; $\alpha(\text{P})=1.82\times 10^{-7}$ 3
952.1 4	3.1 5	9280.2	(25 ⁺)	8328.1	(23 ⁺)	(E2)	0.00305 5	B(E2)(W.u.)=9.E+1 4 $\alpha=0.00305$ 5; $\alpha(\text{K})=0.00257$ 4; $\alpha(\text{L})=0.000376$ 6; $\alpha(\text{M})=8.18\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.18\times 10^{-5}$ 3 $\alpha(\text{N})=1.88\times 10^{-5}$ 3; $\alpha(\text{O})=2.87\times 10^{-6}$ 4; $\alpha(\text{P})=1.780\times 10^{-7}$ 25
955.5 2	2.9 4	8092.9	(22 ⁺)	7137.4	20 ⁺	(E2)	0.00303 5	$\alpha=0.00303$ 5; $\alpha(\text{K})=0.00255$ 4; $\alpha(\text{L})=0.000373$ 6; $\alpha(\text{M})=8.12\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.16\times 10^{-5}$ 3 $\alpha(\text{N})=1.86\times 10^{-5}$ 3; $\alpha(\text{O})=2.85\times 10^{-6}$ 4; $\alpha(\text{P})=1.767\times 10^{-7}$ 25
956.1 2	1.8 2	10702.9	(28 ⁺)	9746.8	(26 ⁺)	E2	0.00303 5	$\alpha=0.00303$ 5; $\alpha(\text{K})=0.00255$ 4; $\alpha(\text{L})=0.000372$ 6; $\alpha(\text{M})=8.10\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.16\times 10^{-5}$ 3 $\alpha(\text{N})=1.86\times 10^{-5}$ 3; $\alpha(\text{O})=2.84\times 10^{-6}$ 4; $\alpha(\text{P})=1.765\times 10^{-7}$ 25 ADO=1.37 0.07.
956.8 4	1.4 3	11352.1	(29 ⁺)	10395.3	(27 ⁺)	(E2)	0.00302 5	$\alpha=0.00302$ 5; $\alpha(\text{K})=0.00255$ 4; $\alpha(\text{L})=0.000372$ 6; $\alpha(\text{M})=8.09\times 10^{-5}$ 12; $\alpha(\text{N}+\dots)=2.16\times 10^{-5}$ 3 $\alpha(\text{N})=1.85\times 10^{-5}$ 3; $\alpha(\text{O})=2.84\times 10^{-6}$ 4; $\alpha(\text{P})=1.762\times 10^{-7}$ 25
975.2 3	6.0 8	6260.1	(18 ⁺)	5285.0	16 ⁺	[E2]	0.00290 4	$\alpha=0.00290$ 4; $\alpha(\text{K})=0.00245$ 4; $\alpha(\text{L})=0.000356$ 5; $\alpha(\text{M})=7.74\times 10^{-5}$ 11; $\alpha(\text{N}+\dots)=2.06\times 10^{-5}$ 3 $\alpha(\text{N})=1.775\times 10^{-5}$ 25; $\alpha(\text{O})=2.72\times 10^{-6}$ 4; $\alpha(\text{P})=1.694\times 10^{-7}$ 24
980.2 3	3.0 3	4768.2	12 ⁻	3788.3	(10 ⁻)	E2	0.00287 4	$\alpha=0.00287$ 4; $\alpha(\text{K})=0.00242$ 4; $\alpha(\text{L})=0.000352$ 5; $\alpha(\text{M})=7.65\times 10^{-5}$ 11; $\alpha(\text{N}+\dots)=2.04\times 10^{-5}$ 3 $\alpha(\text{N})=1.754\times 10^{-5}$ 25; $\alpha(\text{O})=2.69\times 10^{-6}$ 4; $\alpha(\text{P})=1.676\times 10^{-7}$ 24 ADO=1.23 10.
980.2 4	4.5 4	8807.1	24 ⁺	7826.9	(22 ⁺)	E2	0.00287 4	B(E2)(W.u.)=60 9 $\alpha=0.00287$ 4; $\alpha(\text{K})=0.00242$ 4; $\alpha(\text{L})=0.000352$ 5; $\alpha(\text{M})=7.65\times 10^{-5}$ 11; $\alpha(\text{N}+\dots)=2.04\times 10^{-5}$ 3 $\alpha(\text{N})=1.754\times 10^{-5}$ 25; $\alpha(\text{O})=2.69\times 10^{-6}$ 4; $\alpha(\text{P})=1.676\times 10^{-7}$ 24 ADO=1.30 0.10.

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
984 [@] 993.4 2	2.8 3	3737.1 7559.4	21 ⁻	2753.1 6566.0	19 ⁻	E2	0.00279 4	B(E2)(W.u.)=12 +3-4 $\alpha=0.00279$ 4; $\alpha(\text{K})=0.00236$ 4; $\alpha(\text{L})=0.000341$ 5; $\alpha(\text{M})=7.42\times 10^{-5}$ 11; $\alpha(\text{N}+..)=1.98\times 10^{-5}$ 3 $\alpha(\text{N})=1.701\times 10^{-5}$ 24; $\alpha(\text{O})=2.61\times 10^{-6}$ 4; $\alpha(\text{P})=1.631\times 10^{-7}$ 23 ADO=1.39 8.
1010.9 3	2.3 3	7137.4	20 ⁺	6126.5 18 ⁺	E2	0.00269 4	$\alpha=0.00269$ 4; $\alpha(\text{K})=0.00227$ 4; $\alpha(\text{L})=0.000328$ 5; $\alpha(\text{M})=7.13\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.90\times 10^{-5}$ 3 $\alpha(\text{N})=1.635\times 10^{-5}$ 23; $\alpha(\text{O})=2.51\times 10^{-6}$ 4; $\alpha(\text{P})=1.574\times 10^{-7}$ 22 ADO=1.33 0.07 DCO=1.8 0.4.	
1013.5 5	1.9 2	5912.6	(16 ⁺)	4899.2 (14 ⁺)	(E2)	0.00268 4	$\alpha=0.00268$ 4; $\alpha(\text{K})=0.00226$ 4; $\alpha(\text{L})=0.000326$ 5; $\alpha(\text{M})=7.09\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.89\times 10^{-5}$ 3 $\alpha(\text{N})=1.626\times 10^{-5}$ 23; $\alpha(\text{O})=2.49\times 10^{-6}$ 4; $\alpha(\text{P})=1.565\times 10^{-7}$ 22	
1026.6 6	0.8 2	11123.2	(27 ⁺)	10096.6 (25 ⁺)	(E2)	0.00261 4	$\alpha=0.00261$ 4; $\alpha(\text{K})=0.00220$ 3; $\alpha(\text{L})=0.000317$ 5; $\alpha(\text{M})=6.89\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.84\times 10^{-5}$ 3 $\alpha(\text{N})=1.579\times 10^{-5}$ 23; $\alpha(\text{O})=2.42\times 10^{-6}$ 4; $\alpha(\text{P})=1.525\times 10^{-7}$ 22	
1032.0 6	0.7 2	12384.1	(31 ⁺)	11352.1 (29 ⁺)	(E2)	0.00258 4	$\alpha=0.00258$ 4; $\alpha(\text{K})=0.00218$ 3; $\alpha(\text{L})=0.000313$ 5; $\alpha(\text{M})=6.81\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.82\times 10^{-5}$ 3 $\alpha(\text{N})=1.561\times 10^{-5}$ 22; $\alpha(\text{O})=2.39\times 10^{-6}$ 4; $\alpha(\text{P})=1.509\times 10^{-7}$ 22	
1050.2 2	9.1 12	4778.9	(14 ⁺)	3728.5 (12 ⁺)	(E2)	0.00249 4	B(E2)(W.u.)=13 4 $\alpha=0.00249$ 4; $\alpha(\text{K})=0.00210$ 3; $\alpha(\text{L})=0.000301$ 5; $\alpha(\text{M})=6.54\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.746\times 10^{-5}$ 25 $\alpha(\text{N})=1.501\times 10^{-5}$ 21; $\alpha(\text{O})=2.30\times 10^{-6}$ 4; $\alpha(\text{P})=1.456\times 10^{-7}$ 21 ADO=1.30 10 DCO=1.8 4 ($\Delta J=1$ gated) (2002Li22).	
1058.7 3 1060.1 3	4.2 6 1.8 2	4768.2 9628.1	12 ⁻ (25 ⁺)	3709.3 12 ⁺ 8568.0 (23 ⁺)	(E2)	0.00244 4	$\alpha=0.00244$ 4; $\alpha(\text{K})=0.00206$ 3; $\alpha(\text{L})=0.000295$ 5; $\alpha(\text{M})=6.41\times 10^{-5}$ 9; $\alpha(\text{N}+..)=1.710\times 10^{-5}$ 24 $\alpha(\text{N})=1.470\times 10^{-5}$ 21; $\alpha(\text{O})=2.26\times 10^{-6}$ 4; $\alpha(\text{P})=1.429\times 10^{-7}$ 20	
1076 [@] 1 1077.8 3	1.7 2	4785.6 8636.9	13 ⁻ 23 ⁻	3709.3 12 ⁺ 7559.4 21 ⁻	E2	0.00236 4	$\alpha=0.00236$ 4; $\alpha(\text{K})=0.00199$ 3; $\alpha(\text{L})=0.000285$ 4; $\alpha(\text{M})=6.18\times 10^{-5}$ 9; $\alpha(\text{N}+..)=1.648\times 10^{-5}$ 23 $\alpha(\text{N})=1.417\times 10^{-5}$ 20; $\alpha(\text{O})=2.18\times 10^{-6}$ 3; $\alpha(\text{P})=1.382\times 10^{-7}$ 20 B(E2)(W.u.)=5.8 +19-22 ADO=1.60 0.2.	
1104.6 6	2.0 3	8198.4	22 ⁻	7093.1 20 ⁻	E2	0.00224 4	B(E2)(W.u.)=13 +6-7 $\alpha=0.00224$ 4; $\alpha(\text{K})=0.00190$ 3; $\alpha(\text{L})=0.000270$ 4; $\alpha(\text{M})=5.85\times 10^{-5}$ 9; $\alpha(\text{N}+..)=1.597\times 10^{-5}$ 23 $\alpha(\text{N})=1.342\times 10^{-5}$ 19; $\alpha(\text{O})=2.06\times 10^{-6}$ 3; $\alpha(\text{P})=1.315\times 10^{-7}$ 19; $\alpha(\text{IPF})=3.53\times 10^{-7}$ 10 ADO=1.4 0.1.	
1115.1 4	2.0 3	10395.3	(27 ⁺)	9280.2 (25 ⁺)	(E2)	0.00220 3	$\alpha=0.00220$ 3; $\alpha(\text{K})=0.00186$ 3; $\alpha(\text{L})=0.000264$ 4; $\alpha(\text{M})=5.73\times 10^{-5}$ 8; $\alpha(\text{N}+..)=1.582\times 10^{-5}$ 23	

(HI,xn γ) 2008Li08,1997Su11 (continued) $\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
1122.5 5	1.0 1	11825.4	(30 ⁺)	10702.9	(28 ⁺)	(E2)	0.00217 3	$\alpha(\text{N})=1.314\times 10^{-5}$ 19; $\alpha(\text{O})=2.02\times 10^{-6}$ 3; $\alpha(\text{P})=1.291\times 10^{-7}$ 18; $\alpha(\text{IPF})=5.26\times 10^{-7}$ 11
1129.7 8	2.5 3	9222.6	(24 ⁺)	8092.9	(22 ⁺)	(E2)	0.00214 3	$\alpha=0.00217$ 3; $\alpha(\text{K})=0.00184$ 3; $\alpha(\text{L})=0.000260$ 4; $\alpha(\text{M})=5.65\times 10^{-5}$ 8; $\alpha(\text{N+..})=1.576\times 10^{-5}$ 22 $\alpha(\text{N})=1.295\times 10^{-5}$ 19; $\alpha(\text{O})=1.99\times 10^{-6}$ 3; $\alpha(\text{P})=1.274\times 10^{-7}$ 18; $\alpha(\text{IPF})=6.86\times 10^{-7}$ 16
1134 [@]		4862.5	(13)	3728.5	(12 ⁺)			
1181.1 3	0.7 1	10809.2	(27 ⁺)	9628.1	(25 ⁺)	(E2)	0.00196 3	$\alpha=0.00214$ 3; $\alpha(\text{K})=0.00181$ 3; $\alpha(\text{L})=0.000257$ 4; $\alpha(\text{M})=5.57\times 10^{-5}$ 8; $\alpha(\text{N+..})=1.574\times 10^{-5}$ 22 $\alpha(\text{N})=1.278\times 10^{-5}$ 18; $\alpha(\text{O})=1.96\times 10^{-6}$ 3; $\alpha(\text{P})=1.258\times 10^{-7}$ 18; $\alpha(\text{IPF})=8.8\times 10^{-7}$ 3
1192.0 5	0.5 1	6477.3	18 ⁺	5285.0	16 ⁺	(E2)	0.00193 3	$\alpha=0.00196$ 3; $\alpha(\text{K})=0.001660$ 24; $\alpha(\text{L})=0.000233$ 4; $\alpha(\text{M})=5.06\times 10^{-5}$ 7; $\alpha(\text{N+..})=1.721\times 10^{-5}$ 25 $\alpha(\text{N})=1.160\times 10^{-5}$ 17; $\alpha(\text{O})=1.79\times 10^{-6}$ 3; $\alpha(\text{P})=1.151\times 10^{-7}$ 17; $\alpha(\text{IPF})=3.71\times 10^{-6}$ 6
1218.5 3	1.0 4	7501.8	(20 ⁺)	6282.9	(18 ⁺)	(E2)	0.00185 3	$\alpha=0.00193$ 3; $\alpha(\text{K})=0.001630$ 23; $\alpha(\text{L})=0.000229$ 4; $\alpha(\text{M})=4.96\times 10^{-5}$ 7; $\alpha(\text{N+..})=1.79\times 10^{-5}$ 3 $\alpha(\text{N})=1.137\times 10^{-5}$ 16; $\alpha(\text{O})=1.751\times 10^{-6}$ 25; $\alpha(\text{P})=1.130\times 10^{-7}$ 16; $\alpha(\text{IPF})=4.70\times 10^{-6}$ 9 B(E2)(W.u.)=0.068 +21-26
1248.6 9	0.8 2	7531.6	(20 ⁺)	6282.9	(18 ⁺)	(E2)	0.001764 25	$\alpha=0.00185$ 3; $\alpha(\text{K})=0.001561$ 22; $\alpha(\text{L})=0.000218$ 3; $\alpha(\text{M})=4.73\times 10^{-5}$ 7; $\alpha(\text{N+..})=2.03\times 10^{-5}$ 3 $\alpha(\text{N})=1.085\times 10^{-5}$ 16; $\alpha(\text{O})=1.672\times 10^{-6}$ 24; $\alpha(\text{P})=1.082\times 10^{-7}$ 16; $\alpha(\text{IPF})=7.64\times 10^{-6}$ 12
1277.8 6	1.0 2	7843.9	21 ⁻	6566.0	19 ⁻	E2	0.001690 24	$\alpha=0.001764$ 25; $\alpha(\text{K})=0.001488$ 21; $\alpha(\text{L})=0.000207$ 3; $\alpha(\text{M})=4.49\times 10^{-5}$ 7; $\alpha(\text{N+..})=2.37\times 10^{-5}$ 4 $\alpha(\text{N})=1.030\times 10^{-5}$ 15; $\alpha(\text{O})=1.588\times 10^{-6}$ 23; $\alpha(\text{P})=1.032\times 10^{-7}$ 15; $\alpha(\text{IPF})=1.169\times 10^{-5}$ 21
1289.5 4	1.2 2	10096.6	(25 ⁺)	8807.1	24 ⁺	(M1+E2)	0.0021 5	$\alpha=0.001690$ 24; $\alpha(\text{K})=0.001422$ 20; $\alpha(\text{L})=0.000198$ 3; $\alpha(\text{M})=4.27\times 10^{-5}$ 6; $\alpha(\text{N+..})=2.76\times 10^{-5}$ 4 $\alpha(\text{N})=9.81\times 10^{-6}$ 14; $\alpha(\text{O})=1.513\times 10^{-6}$ 22; $\alpha(\text{P})=9.86\times 10^{-8}$ 14; $\alpha(\text{IPF})=1.618\times 10^{-5}$ 25 ADO=1.5 0.2.
1309.1 9	0.4 1	13134.6	(32 ⁺)	11825.4	(30 ⁺)	(E2)	0.001617 23	$\alpha=0.0021$ 5; $\alpha(\text{K})=0.0018$ 4; $\alpha(\text{L})=0.00024$ 5; $\alpha(\text{M})=5.2\times 10^{-5}$ 10; $\alpha(\text{N+..})=3.3\times 10^{-5}$ 4 $\alpha(\text{N})=1.20\times 10^{-5}$ 24; $\alpha(\text{O})=1.9\times 10^{-6}$ 4; $\alpha(\text{P})=1.3\times 10^{-7}$ 3; $\alpha(\text{IPF})=1.91\times 10^{-5}$ 11
1381.3 4	0.5 1	4546.2	(11 ⁻)	3164.9	10 ⁺	(E1)	0.000757 11	$\alpha=0.001617$ 23; $\alpha(\text{K})=0.001356$ 19; $\alpha(\text{L})=0.000188$ 3; $\alpha(\text{M})=4.06\times 10^{-5}$ 6; $\alpha(\text{N+..})=3.26\times 10^{-5}$ 5 $\alpha(\text{N})=9.33\times 10^{-6}$ 14; $\alpha(\text{O})=1.439\times 10^{-6}$ 21; $\alpha(\text{P})=9.41\times 10^{-8}$ 14; $\alpha(\text{IPF})=2.17\times 10^{-5}$ 4
								$\alpha=0.000757$ 11; $\alpha(\text{K})=0.000546$ 8; $\alpha(\text{L})=7.04\times 10^{-5}$ 10; $\alpha(\text{M})=1.510\times 10^{-5}$ 22;

(HI,xn γ) [2008Li08,1997Su11](#) (continued)

$\gamma(^{142}\text{Gd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
1445.7 8	0.2 1	14580.3	(34 ⁺)	13134.6	(32 ⁺)	(E2)	0.001373 20	$\alpha(\text{N+..})=0.0001254$ $\alpha(\text{N})=3.47\times 10^{-6}$ 5; $\alpha(\text{O})=5.39\times 10^{-7}$ 8; $\alpha(\text{P})=3.68\times 10^{-8}$ 6; $\alpha(\text{IPF})=0.0001214$ 18 $\alpha=0.001373$ 20; $\alpha(\text{K})=0.001121$ 16; $\alpha(\text{L})=0.0001533$ 22; $\alpha(\text{M})=3.31\times 10^{-5}$ 5; $\alpha(\text{N+..})=6.56\times 10^{-5}$ $\alpha(\text{N})=7.60\times 10^{-6}$ 11; $\alpha(\text{O})=1.176\times 10^{-6}$ 17; $\alpha(\text{P})=7.77\times 10^{-8}$ 11; $\alpha(\text{IPF})=5.68\times 10^{-5}$ 9
1462.1 10	0.7 1	5912.6	(16 ⁺)	4450.7	14 ⁺	(E2)	0.001349 19	$\alpha=0.001349$ 19; $\alpha(\text{K})=0.001097$ 16; $\alpha(\text{L})=0.0001498$ 21; $\alpha(\text{M})=3.24\times 10^{-5}$ 5; $\alpha(\text{N+..})=7.05\times 10^{-5}$ $\alpha(\text{N})=7.43\times 10^{-6}$ 11; $\alpha(\text{O})=1.149\times 10^{-6}$ 17; $\alpha(\text{P})=7.61\times 10^{-8}$ 11; $\alpha(\text{IPF})=6.19\times 10^{-5}$ 10

[†] Additional information 3.

[‡] The ordering of the 234.5 γ -192.6 γ cascade was reversed in [2002Li22](#).

From [2002Li22](#).

@ Given by [1997Su11](#), not seen In [2008Li08](#).

& Multiply placed with intensity suitably divided.

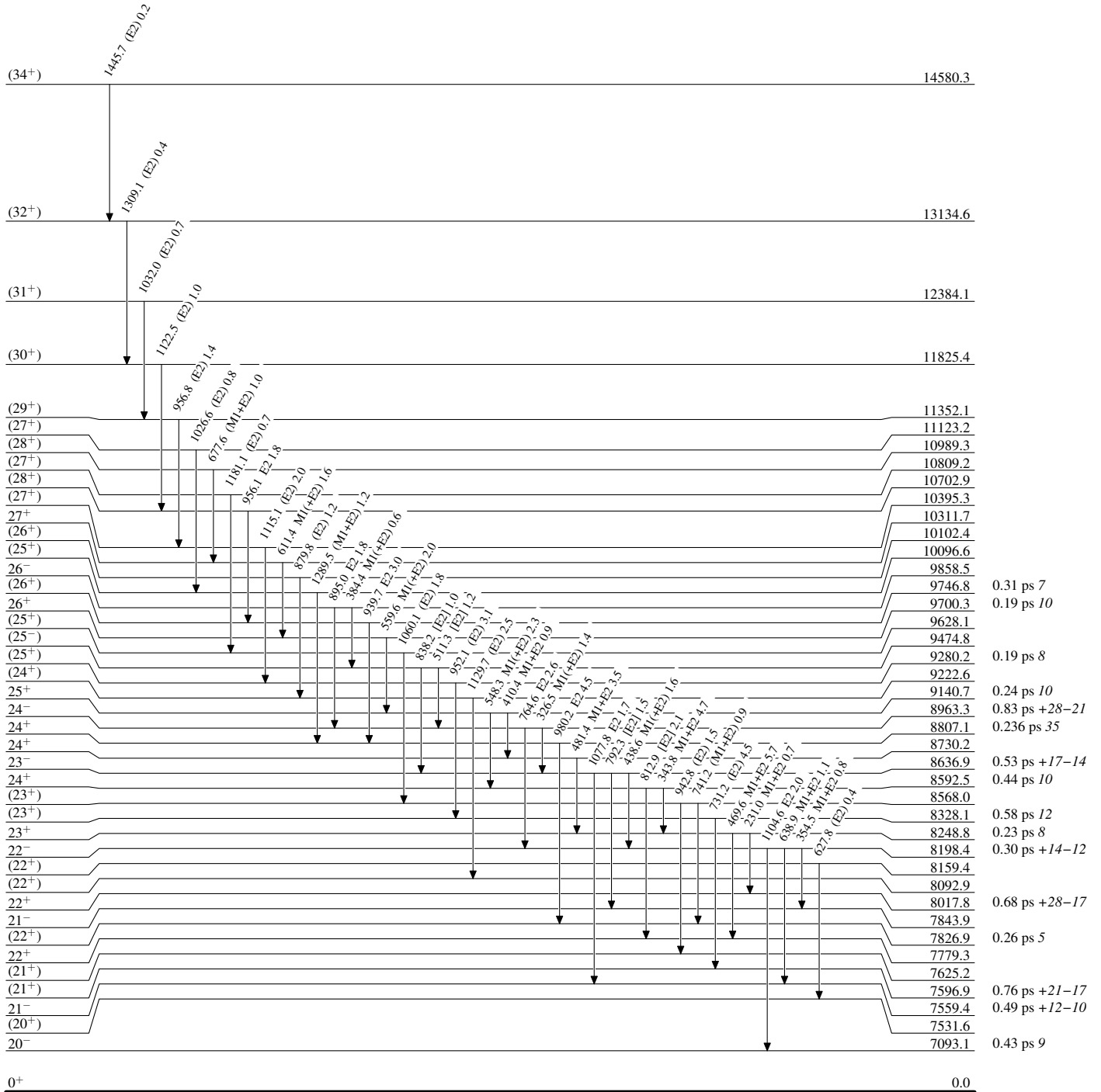
(HI,xn γ) 2008Li08,1997Su11

Level Scheme

Intensities: Relative I γ

Legend

- I γ < 2% \times I γ^{max}
- I γ < 10% \times I γ^{max}
- I γ > 10% \times I γ^{max}



¹⁴²Gd₇₈

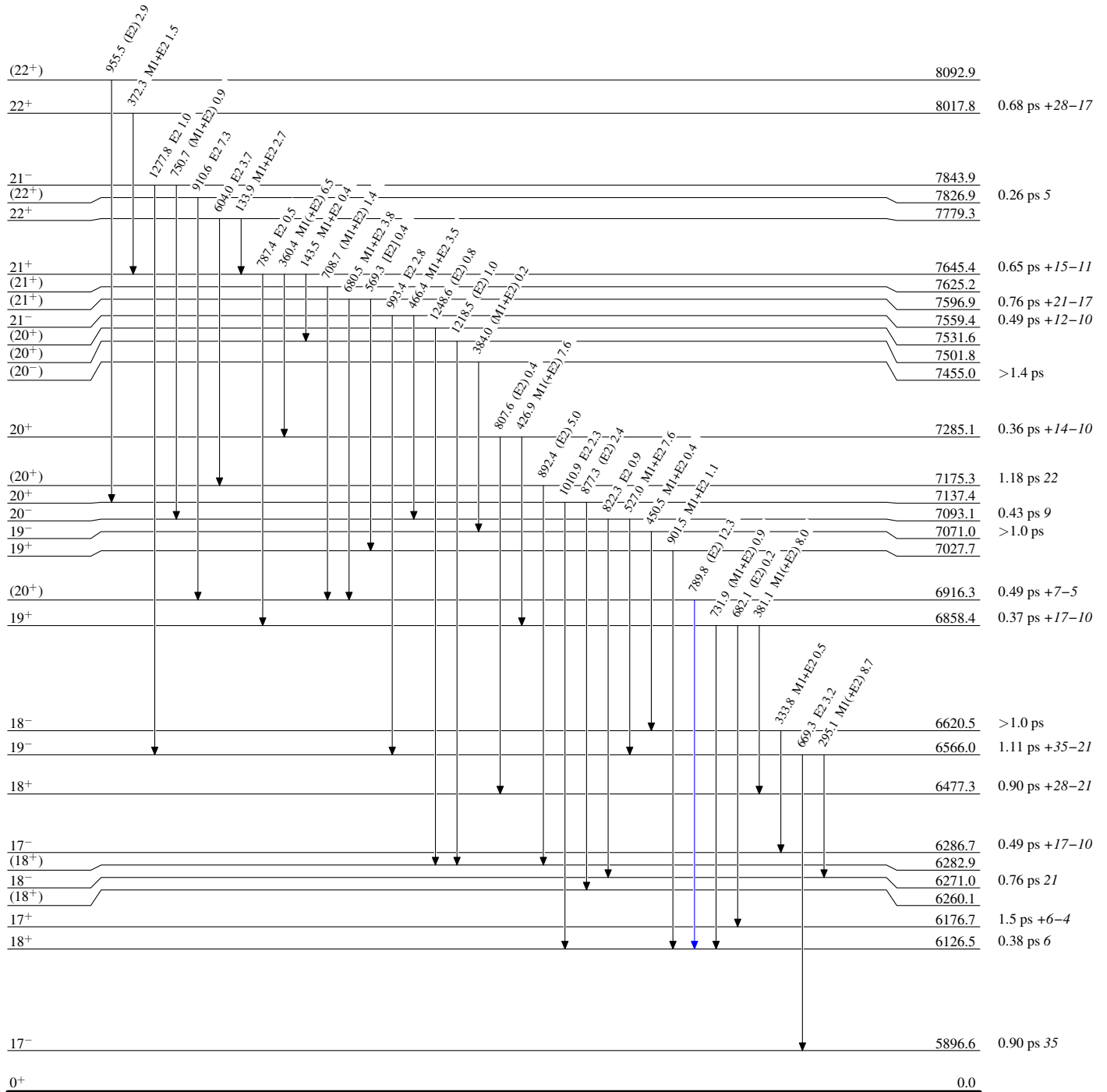
(HI,xn γ) 2008Li08,1997Su11

Level Scheme (continued)

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



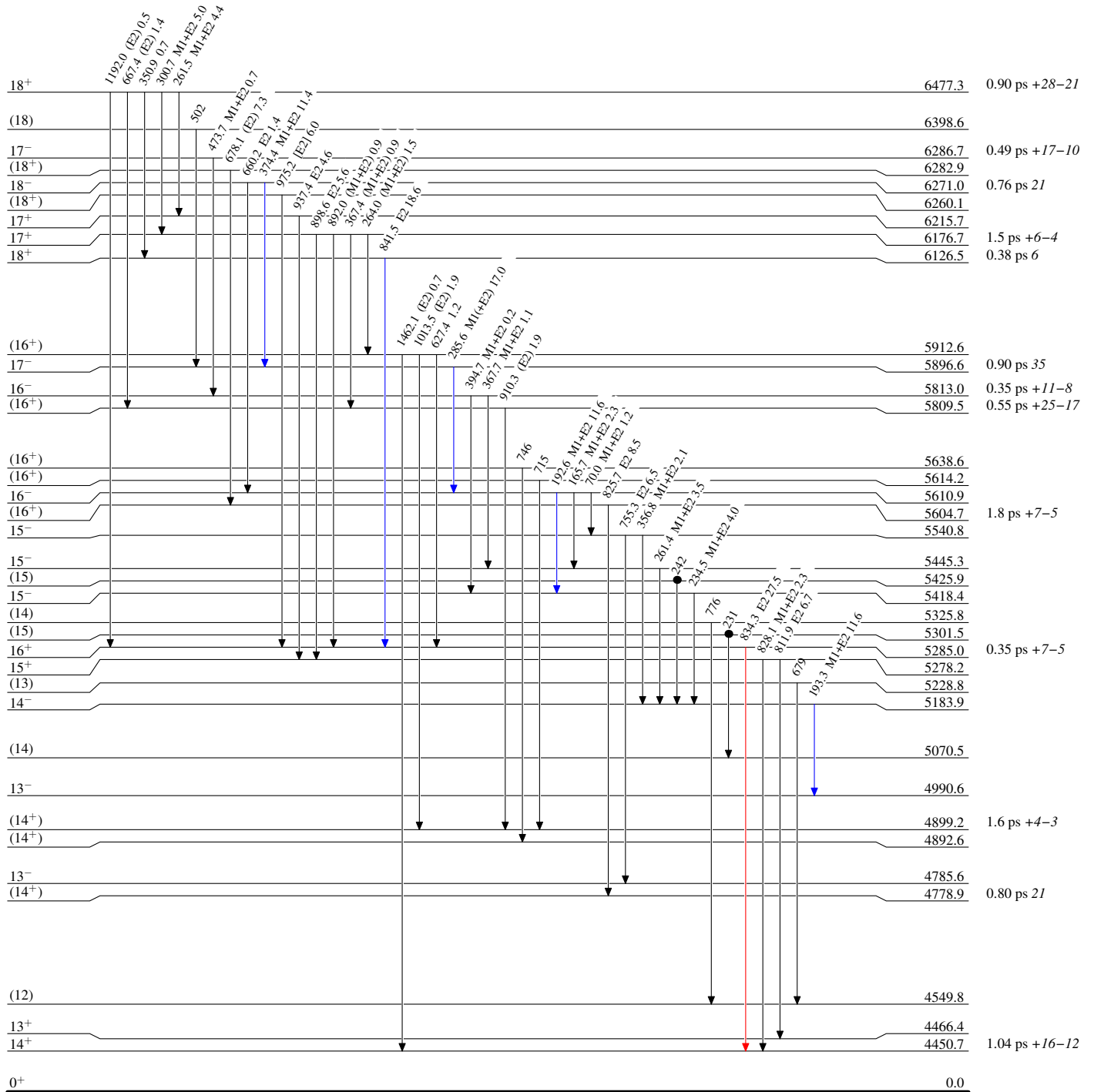
(HI,xn) 2008Li08,1997Su11

Legend

Level Scheme (continued)

Intensities: Relative I_γ

- I_γ < 2% × I_γ^{max}
- I_γ < 10% × I_γ^{max}
- I_γ > 10% × I_γ^{max}
- Coincidence



¹⁴²Gd₇₈

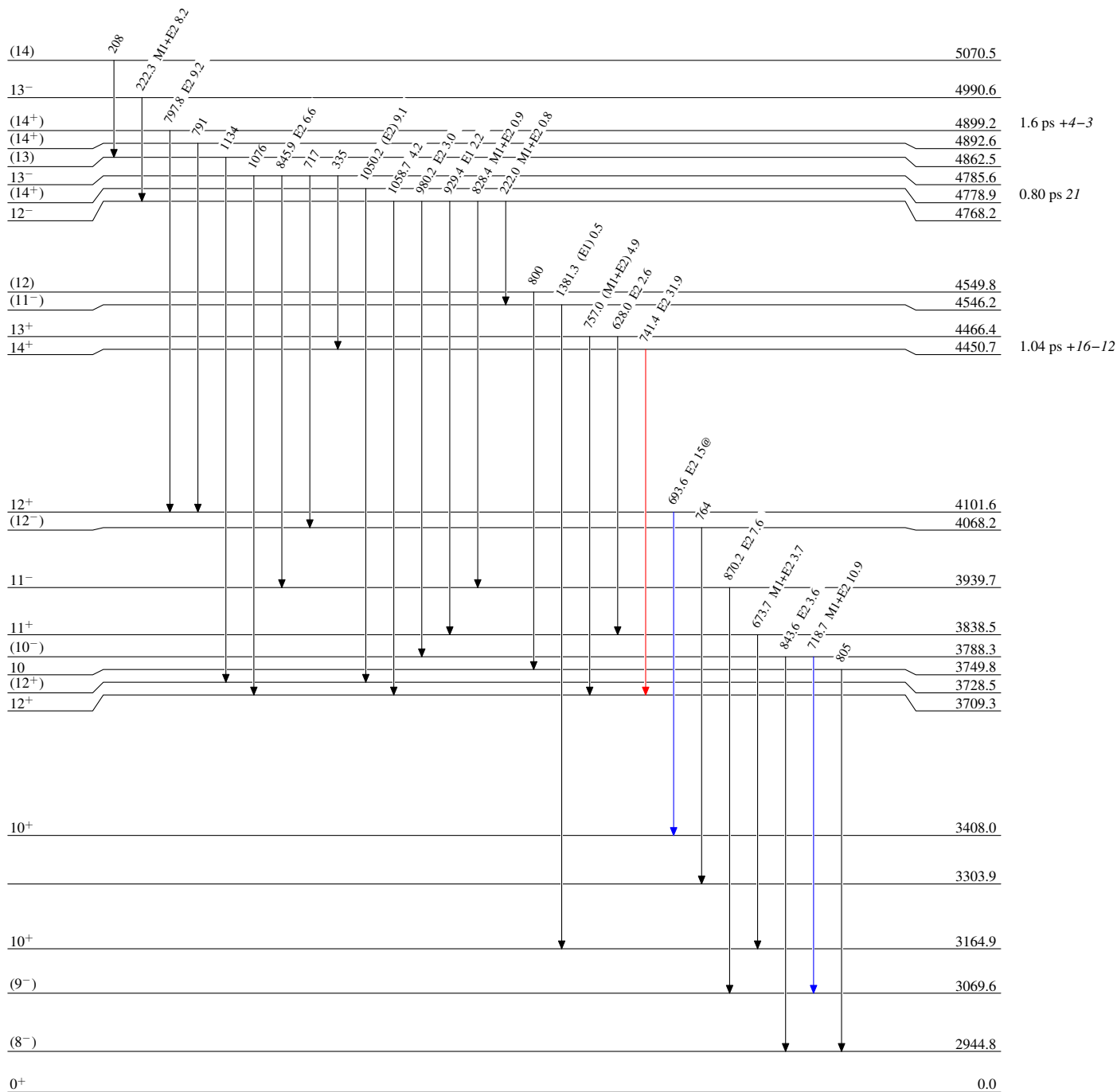
(HI,xn γ) 2008Li08,1997Su11

Level Scheme (continued)

Legend

Intensities: Relative I γ
@ Multiply placed: intensity suitably divided

- I γ < 2% × I γ^{max}
- I γ < 10% × I γ^{max}
- I γ > 10% × I γ^{max}



¹⁴²Gd₇₈

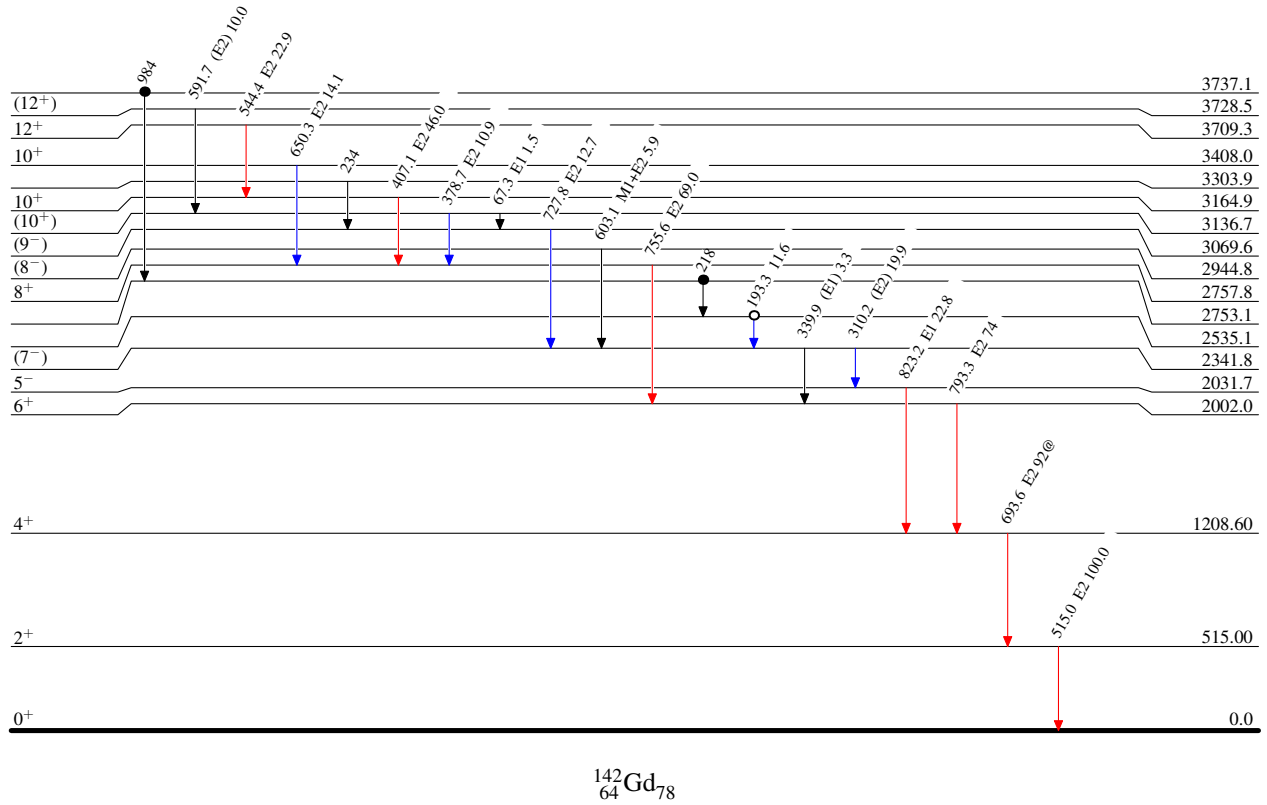
(HI,xn γ) 2008Li08,1997Su11

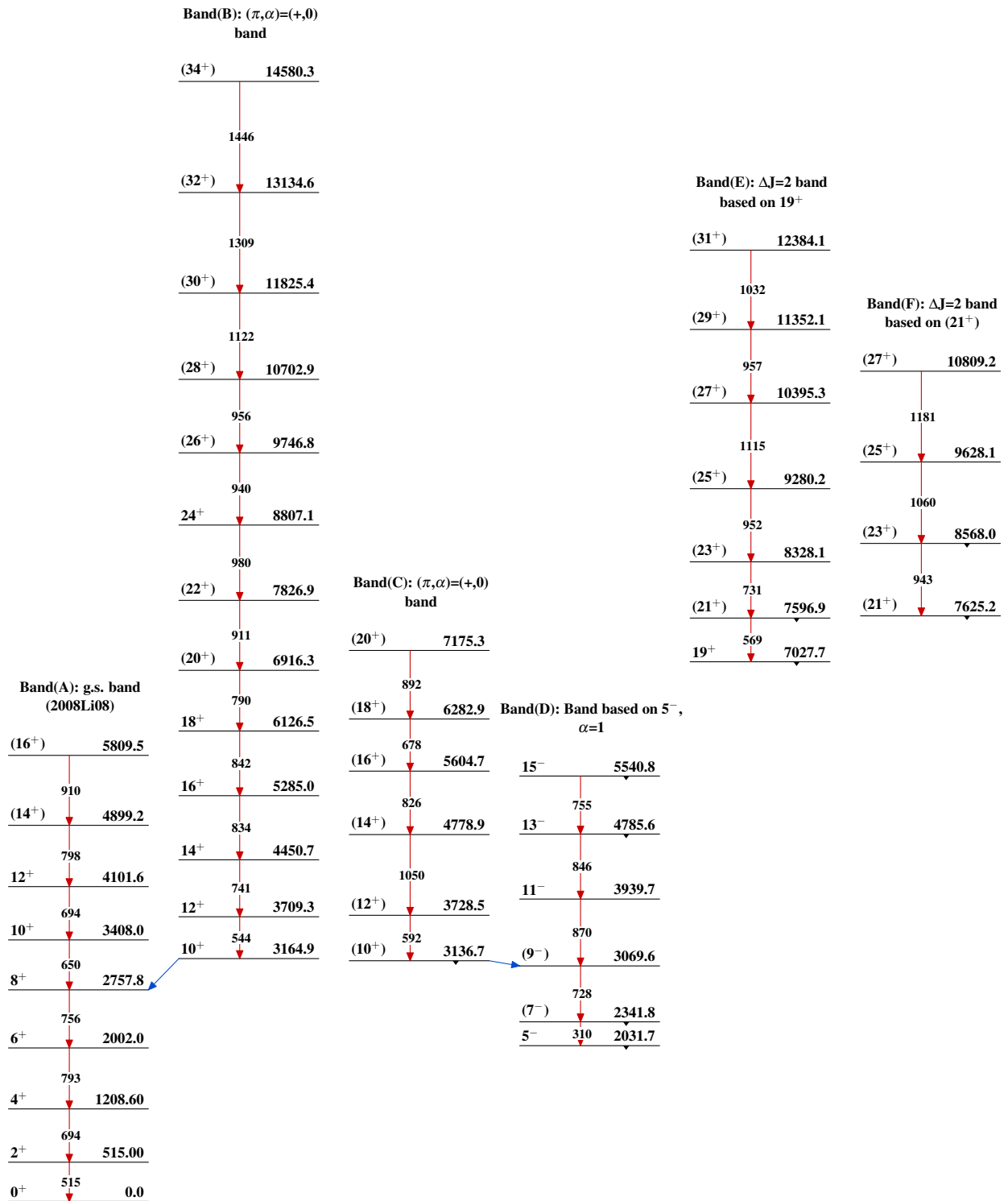
Level Scheme (continued)

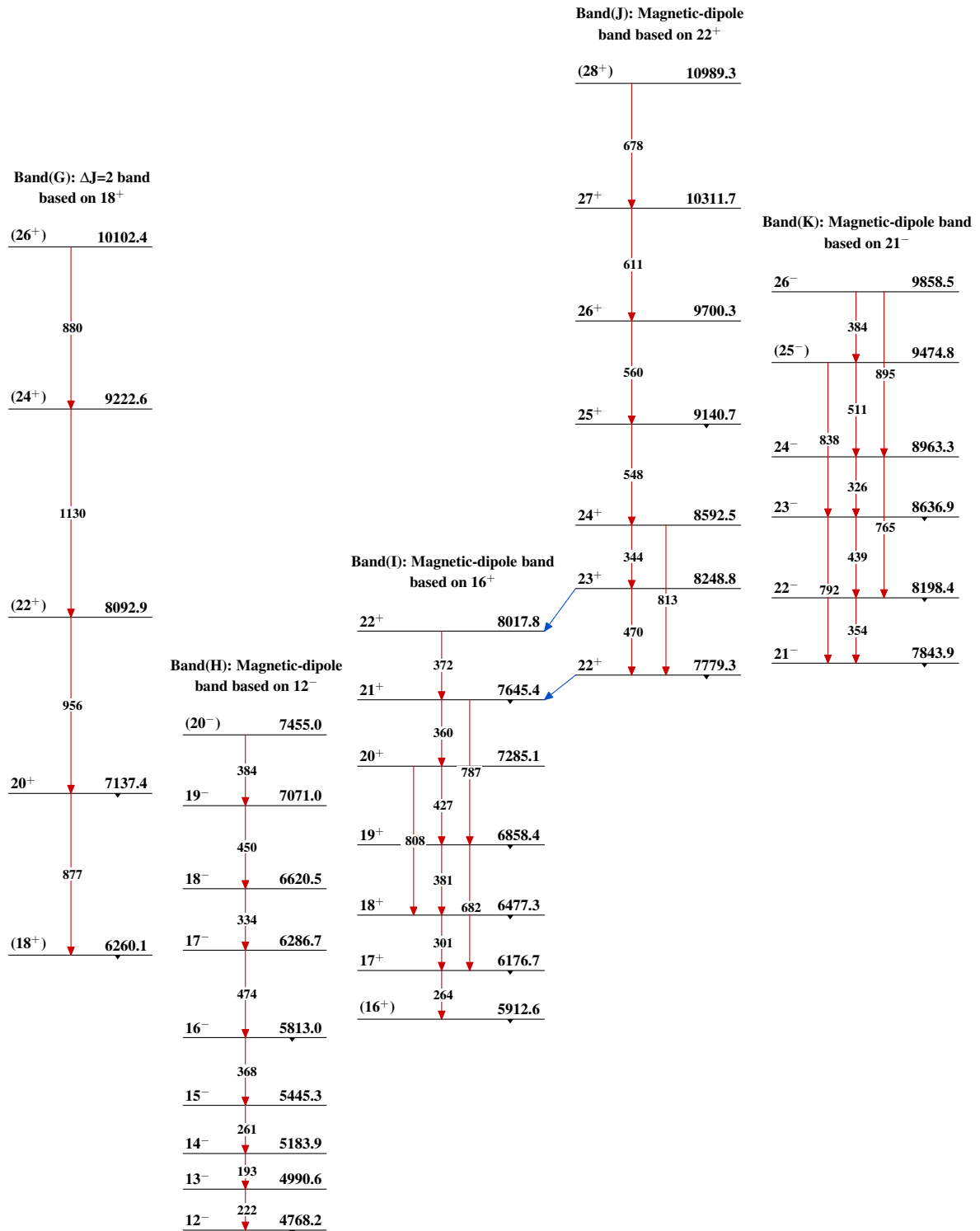
Intensities: Relative I γ
@ Multiply placed: intensity suitably divided

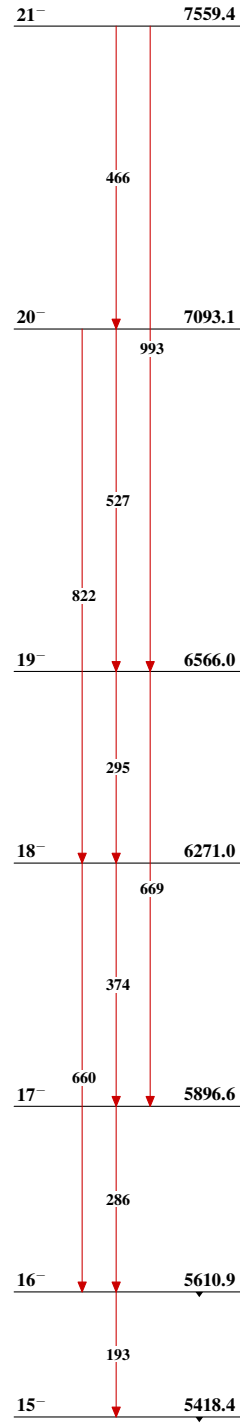
Legend

- \blackrightarrow I γ < 2% \times I γ^{max}
- \bluearrow I γ < 10% \times I γ^{max}
- \redarrow I γ > 10% \times I γ^{max}
- \bullet Coincidence
- \circ Coincidence (Uncertain)



(HI,xn γ) 2008Li08,1997Su11

(HI,xn γ) 2008Li08,1997Su11 (continued) $^{142}_{64}\text{Gd}_{78}$

(HI,xn γ) 2008Li08,1997Su11 (continued)**Band(L): Magnetic-dipole band
based on 15^-**  $^{142}_{64}\text{Gd}_{78}$