Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, E. A. Mccutchan	NDS 165,1 (2020)	1-Mar-2020

Q(β^-)=−6111 *3*; S(n)=11968 *3*; S(p)=8353.2 *16*; Q(α)=−6674.3 *612* 2017Wa10
S(2n)=21286 *5*; S(2p)=15428.86 *12* (2017Wa10).
α: Additional information 1.

^{90}Zr Levels

Cross Reference (XREF) Flags

A	^{90}Y β^- decay (64.00 h)	N	^{90}Zr(α,α')	Others:	
B	^{90}Y β^- decay (3.19 h)	O	^{91}Zr(^{3}He,α)	AA	^{90}Zr(e,e′)
C	^{90}Nb ε decay	P	^{89}Y(p,γ)	AB	^{92}Zr(p,t)
D	^{90}Zr IT decay (809.2 ms)	Q	^{90}Zr(e,e′p),(γ,p)	AC	^{91}Zr(d,t)
E	^{76}Ge(^{18}O,4nγ)	R	^{90}Zr(γ,n)	AD	^{88}Sr(^{3}He,n)
F	^{87}Sr(α,nγ)	S	^{89}Y(p,n),(p,nγ)	AE	^{88}Sr(^{16}O,^{14}C),(^{12}C,^{10}Be)
G	^{89}Y(^{3}He,d)	T	^{89}Y(p,p),(pol p,p)	AF	^{90}Zr(n,n′)
H	^{90}Zr(t,t′)	U	^{89}Y(p,p′),(p,p′γ)	AG	^{92}Zr($\alpha,^6$He)
I	^{91}Zr(p,d)	V	^{90}Zr(p,p′)	AH	^{94}Mo(d,^{6}Li)
J	^{90}Zr(^{3}He,dp)	W	^{90}Zr(p,p′γ)	AI	^{92}Mo(^{14}C,^{16}O)
K	^{89}Y(d,n)	X	^{90}Zr(n,n′γ)	AJ	Coulomb excitation
L	^{90}Zr(d,d′)	Y	^{93}Nb(p,α)	AK	^{90}Zr(^{17}O,^{17}O′),(^{17}O,^{17}O′γ)
M	^{90}Zr(^{3}He,^{3}He′)	Z	^{90}Zr(γ,γ')	AL	^{208}Pb(^{90}Zr,^{90}Zr′γ)

E(level)†	J$^\pi$	T$_{1/2}$‡	XREF		Comments
0	0$^+$	stable	ABCDEFGHIJKLMNOP	VWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK
1760.74 *14*	0$^+$	61.3 ns *25*	A CDE GH KL P	VWXY	XREF: Others: AB, AC, AD, AF, AH, AI, AK, AL T$_{1/2}$: from delayed coincidence in ^{90}Zr(p,p′e). Other: 62 ns *4* (1959Kl46). J$^\pi$: E0 1760.7 transition to 0$^+$.
2186.273 *14*	2$^+$	87.9 fs *21*	A CDEF HIJ LMNOP	VWXYZ	XREF: Others: AA, AB, AE, AF, AG, AH, AI, AJ, AK, AL μ=2.5 *4* T$_{1/2}$: from DSA measurements following projectile Coulomb excitation using ^{90}Zr (2000Ja11). Others: 87.0 fs *28* from (e,e′) Coulomb excitation (1984He02), 93 fs *5* from nuclear resonance fluorescence (1972Me04), 82 fs *+16−12* from Doppler-Shift Attenuation in ^{89}Y(p,γ) (1993Sa38) and 86.6 fs *+49−42* from ^{90}Zr(n,n′γ) (2013Pe16). μ: from Transient Field Integral Perturbed Angular Correlation (2000Ja11,2014StZZ). J$^\pi$: E2 2186γ to 0$^+$.
2319.000 *9*	5$^-$	809.2 ms *20*	BCDEFGH KL N P	VWXY	XREF: Others: AB, AE, AG, AH, AK, AL %IT=100 μ=6.25 *13* T$_{1/2}$: from (n,n′γ). μ: From Nuclear Magnetic Resonance on Oriented Nuclei (1987Ed02,1987Ra17,2014StZZ). J$^\pi$: E5 2319.0γ to 0$^+$.
2739.29 *5*	(4)$^-$		C EFG I K M O		XREF: Others: AK, AL J$^\pi$: 2252.9γ from 2$^-$, 420.3γ to 5$^-$.
2747.875 *16*	3$^-$	15.2 ps *28*	C EF H J L N P	VWX	XREF: Others: AB, AE, AG, AH, AI, AK, AL

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)†	Jπ	T1/2‡	XREF	Comments
				μ=3.0 *2* μ: From Nuclear Magnetic Resonance on Oriented Nuclei (2000Ja11,2014StZZ). Jπ: E3 2747.5γ to 0+.
3076.925 *15*	4+		C EF HI L NOP VWXY	XREF: Others: AA, AE, AF, AH, AK, AL Jπ: E2 890.6γ to 2+.
3308.10 *8*	2+	67.9 fs *+42−35*	F HI L NOP VWXYZ	XREF: Others: AA, AE, AF, AG, AH, AK, AL T1/2: from measurement with metallic sample in (n,n′γ) (2013Pe16). Others: 69 fs *13* from Coul. ex. in (e,e′) (1984He02), 72 fs *21* from nuclear resonance fluorescence (1974Me13), 96 fs *+6−5* from Doppler-Shift Attenuation in ^{89}Y(p,γ) (1993Sa38), and 97 fs *14* from Doppler-Shift Attenuation in ^{90}Zr(n,n′γ) (1993BeZL). Jπ: E2 3308.1γ to 0+.
3448.230 *14*	6+	>1.46 ps	C EF H L N V XY	XREF: Others: AA, AH, AK, AL Jπ: E2 371.3γ to 4+.
3557 *5*			I	E(level): From ^{91}Zr(p,d).
3589.418 *15*	8+	131 ns *4*	C EF H V XY	XREF: Others: AA, AH, AL Q=−0.51 *3*; μ=+10.84 *6* T1/2: weighted average of 125 ns *6* from delayed coincidence in ^{90}Nb ε decay (1964Lo02) and 134 ns *4* from γ(t) (1977Ha49). Q: from time-differential Perturbed Angular Distribution (1977Ha49,1989Ra17,2014StZZ). μ: from time-differential Perturbed Angular Distribution, corrected for diamagnetic shift and Knight shift (1985Ra09,1989Ra17,2014StZZ). Jπ: E2 141.2γ to 6+.
3842.34 *11*	2+	15.1 fs *12*	HI LMNOP VWXYZ	XREF: Others: AA, AG, AH, AL T1/2: weighted average of 15.1 fs *9* from Coul. ex. in (e,e′) (1984He02), 19.0 fs *27* from nuclear resonance fluorescence, Γγ0/Γγ=1 was assumed, 14 fs *+6−4* from Doppler-Shift Attenuation in ^{89}Y(p,γ) (1993Sa38), 10 fs *3* from Doppler-Shift Attenuation in 90Zr(n,n′γ) (1993BeZL) and 24 fs *5* from DSA measurements in (n,n′γ) (2003Ga23). Jπ: E2 3842γ to 0+.
3932.4 *6*			Z	
3958.59 *10*	5−	33 fs *6*	H L N V XY	XREF: Others: AA, AH Jπ: from DWBA analysis of σ(θ) in (e,e′), L(p,p′)=5.
4058.07 *9*	4+	0.12 ps *+6−4*	H V X	XREF: Others: AA, AL
4124.49 *14*	0+		N P V XY	XREF: Others: AB, AG, AH Jπ: from L(p,p′)=0, L(p,t)=0.
4223& *2*	(2)+		HI L Y	XREF: Others: AA, AK Jπ: from L(d,d′)=2.
4225.35 *12*	(4−)	20 fs *5*	K N X	XREF: Others: AA Jπ: (M1+E2) 1905.5γ to 5−, 1478.0γ to 3−.
4229.05 *9*	2+	27 fs *3*	G X	XREF: Others: AA, AG Jπ: E2 4229.3γ to 0+.
4232.220 *24*	(6−)	45 fs *+37−19*	C P V X	XREF: Others: AB Jπ: (M1+E2) 1913.19γ to 5−, feeding from 8+ parent in ^{90}Nb ε decay.

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
4236.96 *10*	(1,2+)	104 fs *21*	WX	Jπ: 2476.2γ to 0+.
4262.37 *8*	(3+)	0.28 ps *+13−7*	X	Jπ: (M1+E2) 1185.6γ to 4+, (M1+E2) 2076.2γ to 2+.
4299.12 *11*	(5−)	31 fs *6*	X	Jπ: (M1+E2) 1908.1γ to 5−, (M1+E2) 1559.9γ to (4)−.
4305[@] *6*	4+		N V	Jπ: from L(α,α′)=4.
4319.2? *3*			C HI Y	XREF: Others: AH
4331.93 *9*	4+	37 fs *6*	NO V X	XREF: Others: AA, AB, AG Jπ: from L(p,t)=4. Suggested to be the 4+ member of the configuration=((ν 1g9/2)−1(ν d5/2)) multiplet.
4348.10 *13*	(4+)	29 fs *7*	LM X	Jπ: shape of excitation function consistent with J=4 in (n,n′γ), 2161.9γ to 2+.
4375.07 *6*	7−		C H N V XY	XREF: Others: AL Jπ: from L(α,α′)=7.
4426.43 *13*	0+	0.20 ps *+24−8*	K P V XY	XREF: Others: AB, AH Jπ: from L(p,t)=0.
4454.71 *10*	(5+)		HI O XY	XREF: Others: AA Jπ: shape of excitation function in (n,n′γ) consistent with J=4 or 5; L(3He,α)=(4) and suggested to be the 5+ member of the configuration=((ν 1g9/2)−1(ν d5/2)) multiplet.
4455.58 *10*	(2)	0.14 ps *+5−3*	V XY	Jπ: D+Q 1707.9γ to 3−.
4474.31 *14*	4+	0.15 ps *+18−6*	N V XY	XREF: Others: AA Jπ: from comparison of DWBA calculations to σ(θ) in (e,e′).
4494.79 *12*	(3−)	42 fs *8*	V X	Jπ: D+Q 1755.5γ to (4)−, 1747.2γ to 3−, L(p,p′)=(3).
4500[f] *15*	0+,1+,2+		G	Jπ: from L(3He,d)=1.
4507.0 *8*			Z	
4533.52 *10*	(3−)	69 fs *+35−28*	HI X	Jπ: (M1+E2) 1794.2γ to (4)−, 2347.3γ to 2+.
4537.70 *11*	(4−)	0.13 ps *+7−5*	K XY	XREF: Others: AG, AH Jπ: (M1+E2) 2218.7γ to 5−.
4541.37 *3*	6+	59 fs *+17−12*	C NO V X	XREF: Others: AA, AB Jπ: from L(p,t)=6; suggested to be the 6+ member of the configuration=((ν 1g9/2)−1(ν d5/2)) multiplet.
4562.02 *14*	5	0.14 ps *+10−4*	G I X	XREF: Others: AA Jπ: shape of excitation function in (n,n′γ) consistent with J=5.
4578.93 *13*	(1)	5.1 fs *20*	P X Z	T1/2: other=8.7 fs *+13−9* from DSA in ^{89}Y(p,γ). Jπ: population in (γ,γ′).
4591.37 *10*	(3+)	0.14 ps *+4−3*	H O V X	Jπ: shape of excitation function in (n,n′γ) consistent with J=5;ssuggested to be the 3+ member of the configuration=((ν 1g9/2)−1(ν d5/2)) multiplet in (3He,α).
4614.42 *13*	(6+)		X	Jπ: shape of excitation function in (n,n′γ) consistent with J=6, 1537.6γ to 4+.
4640.94 *4*	7,8		C X	Jπ: feeding from 8+ parent in ^{90}Nb beta decay, 1192.7γ to 6+.
4646.7 *3*	1,2+	5 fs *4*	GHI P V X	XREF: Others: AG, AH Jπ: 4646.6γ to 0+.
4681.26 *12*	2+	31 fs *7*	NOP V X	XREF: Others: AA, AB, AK

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)†	Jπ	$T_{1/2}$‡	XREF	Comments
				Jπ: E2 4680.8γ to 0^+; suggested to be the 2^+ member of the configuration=$((\nu\ 1g_{9/2})^{-1}(\nu\ d_{5/2}))$ multiplet in (^{3}He,d).
4701.10 *10*	2^+	46 fs *7*	X	Jπ: E2 2940.6γ to 0^+.
4710@ *6*			V	E(level): possibly the same as the 4701 level. L(p,p′)=2 would be consistent with Jπ of 4701 level.
4774.29 *13*			G X	
4781.81 *20*	4,(3^-)	14 fs *+22−13*	V X	Jπ: shape of excitation function in (n,n′γ) consistent with J=3 or 4; 2462.8γ to 5^-.
4795.6 *3*	2^+	7 fs *+6−3*	HI X	XREF: Others: AH Jπ: E2 4795.5γ to 0^+.
4814.44 *11*	(3^-)		X	XREF: Others: AB Jπ: from L(p,t)=3, assuming the 4814 level corresponds to that observed in (p,t).
4818.02 *12*	(3,4^+)	0.14 ps *+19−7*	N X	XREF: Others: AB, AG Jπ: shape of excitation function in (n,n′γ) consistent with J=3 or 4, 975.8γ to 2^+.
4824.21 *13*	2^+	40 fs *+10−8*	V X	Jπ: L(p,t)=2; 1747.2γ to 4^+, 4823.9γ to 0^+.
4840.27 *14*	5^-	83 fs *+28−14*	X	Jπ: shape of excitation function in (n,n′γ) consistent with J=5, 2092.7γ to 3^-.
4849@ *6*			V	
4867.47 *12*	5^+	0.14 ps *+5−4*	X	Jπ: shape of excitation function in (n,n′γ) consistent with J=5, M1+E2 1790.7γ to 4^+.
4875@ *6*			V	
4932.6 *4*	1,2^+	0.18 ps *+35−11*	X	Jπ: 4932.5γ to 0^+.
4941.89 *13*	(4^+)	49 fs *10*	N V X	Jπ: from L(α,α′)=4.
4992.36 *12*		0.21 ps *+13−6*	G I P V X	
5059.975 *21*	7^+		C I NO V X	XREF: Others: AA, AB Jπ: E3 2741γ to 5^-, E1 827.7γ to 6^-; suggested to be the 7^+ member of the configuration=$((\nu\ 1g_{9/2})^{-1}(\nu\ d_{5/2}))$ multiplet in (^{3}He,α).
5068.6 *6*	1,2^+	7 fs *+13−6*	X	Jπ: 5068.4γ to 0^+.
5084.03 *14*	2,3	46 fs *+12−10*	G K V X	XREF: Others: AA Jπ: shape of excitation function in (n,n′γ) consistent with J=2 or 3.
5090.30 *23*	(3^-)		G I P XY	Jπ: shape of excitation function in (n,n′γ) consistent with J=3.
5107.92 *21*	(3),4^+	0.07 ps *+4−3*	H P X	XREF: Others: AB, AG Jπ: 2368.6γ to $(4)^-$, 2921.7γ to 2^+.
5112.6 *14*	3^-		N V X	Jπ: from L(α,α′)=3.
5164.484 *23*	$(8)^+$		C E	Jπ: (E2) 1717.3γ to 6^+, M1,E2 1575.0γ to 8^+.
5171.90 *16*	(4)	23 fs *+8−6*	X	Jπ: shape of excitation function in (n,n′γ) consistent with J=4.
5175.8 *3*	3,4^+	22 fs *+21−8*	G V X Z	Jπ: shape of excitation function in (n,n′γ) consistent with J=3 or 4, 2989.5γ to 2^+.
5183.61 *18*	1,2^+	6.9 fs *35*	P X Z	Jπ: 5183.2γ to 0^+.
5222.97 *23*	(4^+)		H N V X	Jπ: from L(p,p′)=4.
5232.3 *3*		34.0 fs *28*	X	
5247.52 *4*	9^+	<28[g] ps	C E	Jπ: E2(+M1) 1658.1γ to 8^+.
5270.74 *20*		17 fs *+53−16*	X	
5275.4 *10*	(2^+)	0.80[h] ps *+20−11*	P	Jπ: 5275γ (E2) to 0^+.
5305.97 *20*	2^+	17 fs *5*	X Z	Jπ: E2 5305.8γ to 0^+.

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)†	Jπ	$T_{1/2}$‡	XREF	Comments
5307.75 *15*	(3⁻,4⁺)	0.07 ps *+8–2*	G P X	Jπ: 2988.9γ to 5⁻, 3121.3γ to 2⁺.
5312.77 *20*	1,2⁺	59 fs *10*	N V X	XREF: Others: AB Jπ: 5312.6γ to 0⁺.
5317.7 *3*	3⁻	0.19 ps *+11–6*	O X	XREF: Others: AB, AH Jπ: from L(p,t)=3.
5359.22 *19*	3,4	22.9 fs *28*	X	Jπ: shape of excitation function in (n,n′γ) consistent with J=3 or 4.
5379.8 *3*	(4⁺)	20 fs *4*	H N V X	Jπ: from L(p,p′)=L(α,α′)=4.
5426.01 *13*	3⁻	52 fs *+19–14*	C G I X	XREF: Others: AH Jπ: E2 3106.8γ to 5⁻, 2118.1γ to 2⁺.
5432.790 *22*	7⁺,8⁺		C	Jπ: feeding from 8⁺ parent in ^{90}Nb ε decay, M1,E2 1843.3γ to 8⁺, 1984.5γ to 6⁺.
5437.33 *13*	2⁺	24.3 fs *35*	V X	XREF: Others: AG XREF: V(5433). Jπ: from L(p,p′)=2, E2 5436.9γ to 0⁺.
5441# *5*	0⁺			XREF: Others: AB Jπ: from L(p,t)=0.
5457.70 *18*	(4⁺)	115.9 fs *28*	H N V X	XREF: N(5464)V(5462). Jπ: from L(t,t′)=4.
5504.75 *19*		7.7 fs *7*	I N VWX Z	
5513.41 *16*	(3,4)	0.16 ps *+8–6*	X	XREF: Others: AB XREF: AB(5507). Jπ: from L(p,t)=3,4.
5564.2 *4*		7.6 fs *28*	I X	XREF: Others: AH
5582@ *6*	(3⁻)		N V	Jπ: from L(α,α′)=(3).
5590.58 *14*	2⁺	15.9 fs *21*	X	XREF: Others: AB Jπ: from L(p,t)=2.
5601.8 *4*		24 fs *4*	X	
5607.6 *4*		14 fs *+9–7*	G MN X	XREF: Others: AA
5631@ *7*	3⁻		I K V	B(E3)↑=0.0068 *10* (1975Si21) Jπ: from (e,e′).
5644.02 *4*	10⁺	<28g ps	E H	XREF: Others: AH, AL Jπ: E2 2054.6γ to 8⁺.
5651.1 *3*		45 fs *5*	G X	
5666@ *7*	3⁻		NO V	Jπ: from L(α,α′)=3.
5703@ *7*			V	
5724.3 *4*		22 fs *4*	X	
5753@ *7*			G K V	XREF: Others: AA
5775.1 *5*		24 fs *+21–6*	H N X	
5781@ *7*	3⁻		V	XREF: Others: AA B(E3)↑=0.00145 *22* (1975Si21) Jπ: from (e,e′), L(p,p′)=3.
5785.0 *4*			Z	
5792.05 *3*	(9⁺)		E	Jπ: (M1+E2) 2202.6γ to 8⁺.
5808 *4*			O Z	
5821.8 *6*			X	
5829@ *7*			V	
5846.4 *5*		14 fs *+44–13*	G K X	
5884.4 *4*			N VW Z	
5938# *5*			HI N V	XREF: Others: AB, AH Jπ: L(p,p′)=3 and L(p,t)=(1) are in conflict.
5977@ *7*			V	
6006@ *7*			V	

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
6020[f] *15*	1⁻,2⁻,3⁻		G K V	Jπ: L(^{3}He,d)=L(d,n)=2.
6058[@] *7*			V	
6070[f] *15*	1⁻,2⁻,3⁻		GH V	Jπ: L(^{3}He,d)=2.
6106[@] *7*			V	
6128[@] *7*			V	
6167[@] *7*			V	
6200[f] *15*	1⁻,2⁻,3⁻		G K V	Jπ: L(^{3}He,d)=2.
6229[@] *7*			V	
6250[f] *15*	1⁻,2⁻,3⁻		G K V	Jπ: L(^{3}He,d)=L(d,n)=2.
6279.70 *8*	11⁺		E	Jπ: E2 1032.2γ to 9⁺.
6290[@]			V	
6296 *3*	1⁻		H O Z	
6308[@] *7*			V	
6320[f] *15*	1⁻,2⁻,3⁻		G	Jπ: L(^{3}He,d)=2.
6370[f] *15*			G	
6376.10 *5*	(10⁻)	<28[g] ps	E	Jπ: E1(+M2) 818.2γ from (11⁺).
6389.8 *3*	1		Z	Jπ: D 6389.6γ to 0⁺.
6397[@] *7*			G VW	
6424.3 *3*	1⁻[i]		H V Z	XREF: Others: AK
6479[@]			V	
6496[@] *7*			V	
6517[@]			V	
6547[@] *7*			H V	
6565.7 *3*	1		Z	Jπ: D 6565.4γ to 0⁺.
6574[@] *7*			V	E(level): Unresolved doublet.
6640.1 *10*	(2⁺)	21[h] fs +7−6	G P V	Jπ: (E2) 6640γ to 0⁺.
6669.2 *7*	1		G K Z	Jπ: D 6668.9γ to 0⁺.
6694[@]			V	
6710[f] *15*			G V	
6721.11 *5*	(10⁻)		E	Jπ: 1473.7γ to 9⁺.
6742[@]			G V	XREF: Others: AH
6761.4 *2*	1⁻[i]		Z	
6769.51 *14*	(12⁺)		E	Jπ: (M1+E2) 489.8γ to (11⁺).
6794[@] *7*			V	
6810[f] *15*	1⁻,2⁻,3⁻		G K V	Jπ: L(^{3}He,d)=2.
6853[@]			V	
6867[@]			V	
6876 *3*	1⁻[i]		G Z	
6895[@]			V	
6924[@] *8*			V	
6953.94 *6*	(11)⁻	<28[g] ps	E	Jπ: E1(+M2) 1309.8γ to 10⁺.
6960.4 *7*	1		Z	Jπ: D 6960.1γ to 0⁺.
6974[@]			V	
7000[f] *15*	0⁻,1⁻		G K V	Jπ: L(^{3}He,d)=0.
7008.63 *6*	(11⁻)		E	Jπ: (E1(+(M2)) 1364.7γ to 10⁺.
7025.59 *4*	(10⁺)		E	Jπ: (E2) 1861.4γ to (8)⁺.
7042.0 *7*	1		Z	Jπ: D 7041.7γ to 0⁺.

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
7047[@]			V	
7060[@]			V	
7085.6 *10*	(1)		Z	Jπ: (D) 7085.3γ to 0^+.
7089[@]			V	
7110[f] *15*	0^-,1^-		G K	Jπ: from L(^{3}He,d)=0.
7120[@]			V	
7136[@] *8*			V	
7151[@]			V	
7160[f] *15*	1^-,2^-,3^-		G V	Jπ: from L(^{3}He,d)=2.
7194.35 *4*	(11^+)	<28 ps	E	Jπ: M1+E2 168.8γ to (10^+).
7198.2 *6*	1		Z	Jπ: D 7197.9γ to 0^+.
7200[@]			V	
7223.89 *6*	$(12)^+$	59 ps *10*	E	Jπ: E1(+M2) 269.9γ to $(11)^-$.
7235[@]			V	
7250 *3*	1^-[i]		G K Z	
7263[@]			V	
7275[@]			V	
7280.9 *7*			Z	
7350[f] *15*	1^-,2^-,3^-		G V	Jπ: from L(^{3}He,d)=2.
7361.0 *6*	1		Z	Jπ: D 7360.8γ to 0^+.
7378[@] *8*			V	
7387.6 *4*	1		Z	Jπ: D 7387.3γ to 0^+.
7402[@]			V	
7420[f] *15*			G V	
7424.5 *10*			Z	
7433.8 *8*	1		Z	Jπ: D 7433.5γ to 0^+.
7437.82 *7*	$(13)^+$	2.9[g] ps *5*	E	Jπ: M1+E2 213.9γ to $(12)^+$.
7461[@]			V	
7468 *2*			Z	
7474.9 *3*	(1)		Z	Jπ: (D) 7474.6γ to 0^+.
7480[f] *15*			G K	
7530[f] *15*			G V	
7580[f] *15*			G	
7614[@]			V	
7633[@]			V	
7649.9 *10*	(2^+)	0.55[h] ps +*9*−*7*	P	Jπ: (E2) 7650γ to 0^+.
7650[f] *15*	1^-,2^-,3^-		G	Jπ: from L(^{3}He,d)=2.
7685.8 *4*	1		Z	Jπ: D 7685.4γ to 0^+.
7702.9 *3*	1^-[i]		Z	
7723.1 *9*			V Z	
7750[@]			V	
7759.7 *6*	(1)		Z	Jπ: (D) 7759.3γ to 0^+.
7767[@]			G V	
7774[&] *10*			K	XREF: Others: AA
7779.0 *6*	1		Z	Jπ: D 7778.6γ to 0^+.
7796[@]			V	
7806[&] *10*	(2^-)			XREF: Others: AA

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
				Jπ: from (e,e′).
7807.9 *3*	1		Z	Jπ: D 7807.5γ to 0^+.
7840[f] *15*	1^-,2^-,3^-		G K	Jπ: from L(^{3}He,d)=2.
7857.8 *7*	(1)		Z	Jπ: (D) 7857.4γ to 0^+.
7868[&] *10*	(1^+,2^-)			XREF: Others: AA Jπ: from (e,e′).
7877[@]			V	
7907[&] *10*			G V	XREF: Others: AA
7926[@]			V	
7935.6 *3*	1		Z	Jπ: D 7935.2γ to 0^+.
7976.6 *4*	1		Z	Jπ: D 7976.2γ to 0^+.
7984[@]			V	
7996[&] *10*	(3^-)		G K	XREF: Others: AA Jπ: from (e,e′).
8006.9 *8*	1		Z	Jπ: D 8006.5γ to 0^+.
8032[&] *10*	2^-		G	XREF: Others: AA Jπ: from (e,e′).
8058.41 *8*	$(14)^+$	0.28[g] ps *14*	E	Jπ: M1+E2 620.6γ to $(13)^+$.
8067.4 *5*	(1)		Z	Jπ: (D) 8067.0γ to 0^+.
8110 *3*	1^-[i]		Z	XREF: Others: AA
8120[f] *15*			G V	
8131 *3*	(1^-)		Z	XREF: Others: AA Jπ: (E1) 8131.5γ to 0^+.
8144 *2*			Z	
8166.7 *5*	(1)		V Z	Jπ: (D) 8166.3γ to 0^+.
8221.2 *8*	1		Z	Jπ: D 8220.8γ to 0^+.
8235.6 *3*	1		Z	Jπ: D 8235.2γ to 0^+.
8250.7 *5*	1		Z	Jπ: D 8250.3γ to 0^+.
8276[@]			V	
8291[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8295.3 *10*	(1)		Z	Jπ: (D) 8294.9γ to 0^+.
8313.0 *7*	1		Z	Jπ: D 8312.6γ to 0^+.
8316[&] *10*	(2^-)			XREF: Others: AA Jπ: from (e,e′).
8334.1 *5*	1		Z	Jπ: D 8333.7γ to 0^+.
8357.5 *18*	1		Z	Jπ: D 8357.1γ to 0^+.
8366[&] *10*	(1^+)			XREF: Others: AA Jπ: from (e,e′).
8382.1 *10*	(1)		Z	Jπ: (D) 8381.7γ to 0^+.
8400[&] *10*	(2^-)			XREF: Others: AA Jπ: from (e,e′).
8403.7 *11*			Z	
8413.5 *4*	1		V Z	Jπ: D 8413.1γ to 0^+.
8430[@]			V	
8440.6 *4*	1		Z	Jπ: D 8440.2γ to 0^+.
8442[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8467.7 *15*			Z	
8501.2 *4*	1^-[i]		Z	XREF: Others: AA
8515[@]			V	

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
8518 *3*			Z	
8542[&] *10*	2^-		V Z	XREF: Others: AA Jπ: from (e,e′).
8544 *4*			Z	
8553.5 *12*	1		Z	Jπ: D 8553.1γ to 0^+.
8588.3 *7*	1		Z	Jπ: D 8587.9γ to 0^+.
8598.2 *10*	1		Z	Jπ: D 8597.8γ to 0^+.
8625.6 *10*	1		Z	Jπ: D 8625.2γ to 0^+.
8627[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8664.1 *5*	1		Z	Jπ: D 8663.7γ to 0^+.
8701[&] *10*	(2^-)			XREF: Others: AA Jπ: from (e,e′).
8716.6 *5*	1^-[i]		Z	
8751.0 *8*	1		Z	Jπ: D 8750.5γ to 0^+.
8760.4 *5*	1		Z	Jπ: D 8759.9γ to 0^+.
8809[&] *10*	(2^-)			XREF: Others: AA Jπ: from (e,e′).
8812.0 *13*	1[j]		Z	
8833.2 *8*	1[j]		Z	
8853[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8874.9 *9*	1[j]		Z	
8882[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8903.0 *8*			Z	
8911[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8927.4 *4*			Z	
8934[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8958.13 *15*	$(15)^-$	0.5[g] ps *3*	E	Jπ: E1 899.7γ to $(14)^+$.
8971[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
8978.4 *9*	(1)		Z	Jπ: (D) 8977.9γ to 0^+.
8985 *2*			Z	
9004.7 *5*	1[j]		Z	
9014.0 *8*			Z	
9034.0 *8*			Z	
9043.6 *4*	1[j]		Z	
9053.5 *7*			Z	
9061[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
9085.1 *3*	1[j]		Z	
9101[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
9111.1 *6*	1[j]		Z	
9123.6 *7*			Z	
9127[&] *10*	2^-			XREF: Others: AA Jπ: from (e,e′).
9137.5 *7*			Z	

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)†	Jπ	$T_{1/2}$‡	XREF	Comments
9148.5 *3*	1^{-}*i*		Z	XREF: Others: AA
9164.9 *7*			Z	
9177.5 *5*			Z	
9187 *3*			Z	
9196.5 *3*	(1^{-})		Z	Jπ: (E1) 9196.0γ to 0^{+}.
9260.5 *6*	1*j*		Z	
9265& *10*	2^{-}			XREF: Others: AA Jπ: from (e,e′).
9292.8 *5*	1*j*		Z	
9294& *10*	2^{-}			XREF: Others: AA Jπ: from (e,e′).
9309.4 *7*	1*j*		Z	
9327& *10*	2^{-}			XREF: Others: AA Jπ: from (e,e′).
9333.4 *6*	1^{-}*i*		Z	
9373.2 *7*			Z	XREF: Others: AA
9392.4 *8*	1*j*		Z	
9409.4 *11*			Z	
9424.3 *10*			Z	
9444.7 *4*	1*j*		Z	XREF: Others: AA
9465.1 *5*	1*j*		Z	
9486.8 *4*	1*j*		Z	
9489& *10*	2^{-}			XREF: Others: AA
9510.5 *13*	(1)		Z	XREF: Others: AA Jπ: (D) 9510.0γ to 0^{+}.
9524.1 *13*	1*j*		Z	
9539.2 *5*	1*j*		Z	
9541& *10*	2^{-}			XREF: Others: AA
9551.4 *6*	1*j*		Z	
9563.0 *6*	1*j*		Z	
9601& *10*	$(1^{-},2^{-})$			XREF: Others: AA
9609.2 *7*			Z	
9625.1 *8*			Z	
9640.4 *8*	1*j*		Z	
9666.0 *8*	(1)		Z	Jπ: (D) 9665.4γ to 0^{+}.
9678.3 *7*	(1^{-})		Z	Jπ: (E1) 9677.7γ to 0^{+}.
9686.9 *6*	1*j*		Z	
9694& *10*	2^{-}			XREF: Others: AA
9707.00? *25*	(16^{-})	0.49*g* ps *14*	E	Jπ: (M1+E2) 748.9γ to (15^{-}).
9733.2 *5*	1*j*		Z	
9741.7 *7*			Z	
9754.0 *6*	1*j*		Z	
9784.6 *5*			Z	
9805.4 *10*			Z	
9836.01 *18*	$(15)^{+}$		E	Jπ: 1777.6γ to $(14)^{+}$.
9843.4 *6*	1*j*		Z	
9855.5 *8*	1*j*		Z	
9863& *10*	$(1^{-},2^{-})$			XREF: Others: AA
9872.4 *4*	1*j*		Z	

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
9890.7 *13*	(1)		Z	Jπ: (D) 9890.1γ to 0^+.
9901.9 *13*			Z	
9932.1 *12*	1[j]		Z	
9962.8 *5*	1[j]		Z	
9984.1 *11*			Z	
10004.2 *10*	1[j]		Z	
10019.6 *11*	1[j]		Z	
10031 *2*			Z	
10042.9 *4*	(1^-)		Z	Jπ: (E1) 10042.3γ to 0^+.
10083.8 *6*	1[j]		Z	
10094.2 *7*	1[j]		Z	
10104.9 *12*	(1)		Z	Jπ: (D) 10104.3γ to 0^+.
10123.7 *18*	1[j]		Z	
10125.84 *18*	$(16)^+$	0.6[g] ps *2*	E	Jπ: M1(+E2) 289.8γ to $(15)^+$.
10146.8 *9*	1[j]		Z	
10163.4 *8*	1[j]		Z	
10193.0 *5*	1[j]		Z	
10216.8 *10*	1[j]		Z	
10233 *4*			Z	
10241 *2*	(1)		Z	Jπ: (D) 10240γ to 0^+.
10260.9 *11*			Z	
10270.0 *7*			Z	
10286.2 *6*	1[j]		Z	
10298.3 *10*	(1)		Z	Jπ: (D) 10297.7γ to 0^+.
10306.6 *9*	1[j]		Z	
10315.1 *4*	1[j]		Z	
10334.9 *6*	1[j]		Z	
10361 *2*	(1)		Z	Jπ: (D) 10360γ to 0^+.
10376.8 *4*	1[j]		Z	
10402.5 *9*	1[j]		Z	
10494.5 *11*	(1)		Z	Jπ: (D) 10493.8γ to 0^+.
10507.9 *8*	1[j]		Z	
10524.6 *4*	1[j]		Z	
10595.0 *7*	1[j]		Z	
10618.7 *8*	1[j]		Z	
10638.5 *9*	1[j]		Z	
10682.2 *6*	1[j]		Z	
10713.2 *12*	(1)		Z	Jπ: (D) 10712.5γ to 0^+.
10728.2 *11*	1[j]		Z	
10764.9 *4*	(17^+)	0.14[g] ps *14*	E	Jπ: (M1+E2) 639.0γ to $(16)^+$.
10827.1 *5*	1[j]		Z	
10914 *2*	(1)		Z	Jπ: (D) 10913γ to 0^+.
10957 *2*	1[j]		Z	
10987.0 *10*	1[j]		Z	
11044 *2*			Z	
11094.2 *15*			Z	
11108.0 *16*			Z	
11120.4 *9*	1[j]		Z	

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
11129.2 *17*			Z	
11140 *2*			Z	
11232.4 *7*	1[j]		Z	
11243.2 *6*	1[j]		Z	
11337.7 *6*	1[j]		Z	
11403.9 *6*	(18$^+$)	0.21[g] ps *11*	E	Jπ: (M1+E2) 639.0γ to (17$^+$).
11417.5 *7*	(1)		Z	Jπ: (D) 11416.7γ to 0$^+$.
11452.2 *10*	1[j]		Z	
11479.7 *8*	1[j]		Z	
11501 *3*			Z	
11510 *7*			Z	
11531 *2*	1[j]		Z	
11627.9 *9*			Z	
11651.5 *8*	(1)		Z	Jπ: (D) 11650.7γ to 0$^+$.
11777.4 *10*	1[j]		Z	
11788 *3*	1[j]		Z	
11963.3 *18*	(1)		Z	Jπ: (D) 11962.4γ to 0$^+$.
11984 *2*	1[j]		Z	
12020.6 *8*	1[j]		Z	
12067.8 *9*	1[j]		Z	
12110.7 *6*	(19$^+$)	0.14[g] ps *5*	E	
12208.3 *12*	1[j]		Z	
12219.6 *25*			P	
12243.6 *14*	1[j]		Z	
12496.3 *18*			Z	
12880.3 *10*			Z	
12964.7 *7*	(20$^+$)	<0.35[g] ps	E	Jπ: 1560.8γ to (18$^+$), 854.0γ to (19$^+$).
13110.2[a] *4*	(2)$^-$		K P ST	E(level),Jπ: Probable analog of ^{90}Y g.s. Additional information 2.
13310[a] *4*	(3)$^-$		K P STU	E(level),Jπ: Probable analog of ^{90}Y, 203 keV.
13940[a]			S	E(level): Possible analog of ^{90}Y, 777 keV.
14090[a]			S	E(level): Possible analog of ^{90}Y, 954 keV.
14220[a]			S	E(level): Possible analog of ^{90}Y, 1048 keV.
14270[d] *30*	(0$^-$,1$^-$)		Q ST	E(level),Jπ: Probable analog of ^{90}Y, 1212 keV.
14310[a]			S	
14410[a]			ST	
14430[b]	(1$^-$)		P S	E(level),Jπ: Probable analog of ^{90}Y, 1371 keV.
14748[e]	(3$^-$)		U	
14878[e]	(0$^-$)		U	
14928[e]	(1$^-$)		U	
15500[b] *30*	2$^-$,(1$^-$)		P S	E(level),Jπ: Probable analog of ^{90}Y, 2474 keV.
15700[b] *30*	1$^-$,(2$^-$)		P ST	E(level),Jπ: Probable analog of ^{90}Y, 2624 keV.
15900[b]	(2$^-$)		P	
16148[e]	(2$^-$)		U	
16258[e]	(1$^-$)		U	E(level),Jπ: Possible analog of ^{90}Y, 3145 keV.
16290[b]			P	
17300[b]			P	
19400[b]			PQR	

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Adopted Levels, Gammas (continued)

^{90}Zr Levels (continued)

E(level)†	XREF
20800[b]	P
21800[c]	R
23700[c]	R

† From least-squares fit to Eγ, by evaluators, except where noted.
‡ From DSAM measurements in ^{90}Zr(n,n′γ) reaction, except where noted.
# From ^{92}Zr(p,t).
@ From ^{90}Zr(p,p′).
& From ^{90}Zr(e,e′).
[a] From ^{89}Y(p,n),(p,nγ).
[b] From ^{89}Y(p,γ).
[c] From ^{90}Zr(γ,n).
[d] From ^{89}Y(p,p).
[e] From ^{89}Y(p,p′),(p,p′γ).
[f] From ^{89}Y(^{3}He,d).
[g] From Doppler-Shift Attenuation and Recoil-Distance measurements in ^{76}Ge(^{18}O,4nγ).
[h] Doppler-shift attenuation in ^{89}Y(p,γ) (1993Sa38).
[i] From E1 transition to 0^+ ground state.
[j] From D transition to 0^+ ground state.

Adopted Levels, Gammas (continued)

γ(^{90}Zr)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
1760.74	0^+	1760.70[#] *20*	[#]	0	0^+	E0[#]			E_γ: from ^{90}Nb ε decay. Probability of two-photon decay is 0.040% *5*, see ^{90}Y β^- decay. Other: 0.018% *2* with a ratio <2E1>/<2M1>of 1.9 *7* (1984Sc37). Probability of one-photon E0 transition for 1760.7 relative to internal conversion is 5×10^{-7} *2* (1990Zh20), see ^{90}Y β^- decay.
2186.273	2^+	425.5 *2*	0.027 *5*	1760.74	0^+	[E2][#]		0.00688	α(K)=0.00602 *9*; α(L)=0.000713 *10*; α(M)=0.0001239 *18*; α(N)=1.732×10^{-5} *25* α(O)=1.117×10^{-6} *16* B(E2)(W.u.)=5.2 *10*
		2186.242[#] *25*	100.0[#] *9*	0	0^+	E2[#]		5.36×10^{-4}	α(K)=0.0001223 *18*; α(L)=1.325×10^{-5} *19*; α(M)=2.29×10^{-6} *4*; α(N)=3.27×10^{-7} *5*; α(O)=2.34×10^{-8} *4* B(E2)(W.u.)=5.38 *13*
2319.000	5^-	132.716[#] *18*	5.04[#] *5*	2186.273	2^+	E3(+M4)[#]	<0.07	3.0 *9*	α(K)=2.2 *7*; α(L)=0.65 *19*; α(M)=0.12 *4*; α(N)=0.015 *5*; α(O)=0.00037 *21* B(E3)(W.u.)=0.180 *10* δ: from ^{90}Nb ε decay.
		2318.959[#] *25*	100.0[#] *2*	0	0^+	E5[#]		4.64×10^{-4}	α(K)=0.000408 *6*; α(L)=4.63×10^{-5} *7*; α(M)=8.04×10^{-6} *12*; α(N)=1.141×10^{-6} *16*; α(O)=7.97×10^{-8} *12* B(E5)(W.u.)=8.74 *33*
2739.29	$(4)^-$	420.28[#] *5*	100[#]	2319.000	5^-	[#]			
2747.875	3^-	429.0[e] *3*	0.53 *11*	2319.000	5^-	[E2]			B(E2)(W.u.)=0.53 *+18−13*
		561.604 *11*	100.0 *3*	2186.273	2^+	E1			B(E1)(W.u.)=1.17×10^{-4} *+27−18* E_γ: from ^{90}Nb ε decay. Mult.: D from γ(θ) in (n,n′γ); E1 from Δπ=yes.
		2747.47 *5*	6.1 *3*	0	0^+	E3			B(E3)(W.u.)=8.0 *+18−13* Mult.: O from γ(θ) in (n,n′γ); M3 excluded by comparison to RUL.
3076.925	4^+	329.09 *3*	6.74 *18*	2747.875	3^-	E1			E_γ: weighted average of 329.058 *16* (^{90}Nb ε decay) and 329.125 *15* (^{90}Zr(n,n′γ)). I_γ: weighted average of 6.82 *23* (^{90}Nb ε decay) and 6.6 *3* (^{90}Zr(n,n′γ)). Mult.: D from γ(θ) in (n,n′γ); Δπ=yes from level scheme.
		337.61 *14*	0.90 *11*	2739.29	$(4)^-$				E_γ: weighted average of 337.50 *15* (^{90}Nb ε decay) and 337.8 *2* (^{90}Zr(n,n′γ)). I_γ: weighted average of 1.4 *5* (^{90}Nb ε decay) and 0.88 *11* (^{90}Zr(n,n′γ)).

$^{90}_{40}Zr_{50}$-14

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
3076.925	4+	757.86 *7*	2.66 *21*	2319.000	5−				E_γ: weighted average of 757.95 *5* (^{90}Nb ε decay) and 757.80 *4* (^{90}Zr(n,n′γ)). I_γ: weighted average of 2.23 *23* (^{90}Nb ε decay) and 2.76 *11* (^{90}Zr(n,n′γ)).
		890.629 *14*	100.0 *3*	2186.273	2+	E2[b]		8.82×10^{-4}	α(K)=0.000777 *11*; α(L)=8.69×10^{-5} *13*; α(M)=1.507×10^{-5} *22*; α(N)=2.13×10^{-6} *3* α(O)=1.479×10^{-7} *21* B(E2)(W.u.)=3.5 *+15−13*; B(M1)(W.u.)=0.065 *6* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.
3308.10	2+	1121.990 *22*	45 *4*	2186.273	2+	M1+E2	+0.25		
		1547.5	3.9 *10*	1760.74	0+	[E2]			B(E2)(W.u.)=1.03 *26*
		3308.1 *2*	100 *4*	0	0+	E2			B(E2)(W.u.)=0.589 *38* Mult.: Q from γ(θ) in (n,n′γ); M2 excluded by comparison to RUL.
3448.230	6+	371.307[#] *8*	1.95[#] *7*	3076.925	4+	E2[#]		0.01064	α(K)=0.00929 *13*; α(L)=0.001119 *16*; α(M)=0.000194 *3*; α(N)=2.71×10^{-5} *4*; α(O)=1.712×10^{-6} *24* B(E2)(W.u.)<46
		1129.224[#] *15*	100.0[#] *4*	2319.000	5−	E1[#]		2.42×10^{-4} *8*	α(K)=0.000203 *7*; α(L)=2.20×10^{-5} *8*; α(M)=3.82×10^{-6} *14*; α(N)=5.42×10^{-7} *20*; α(O)=3.86×10^{-8} *14* B(E1)(W.u.)<1.6×10^{-4}
3589.418	8+	141.178[#] *15*	100.0[#] *10*	3448.230	6+	E2[#]			α(K)=0.27 *3*; α(L)=0.040 *5*; α(M)=0.0071 *9*; α(N)=0.00095 *13*; α(O)=4.6×10^{-5} *7* B(E2)(W.u.)=2.41 *7*
		1270.396[#] *18*	1.94[#] *4*	2319.000	5−	(E3)[#]		7.63×10^{-4}	α(K)=0.000667 *10*; α(L)=7.56×10^{-5} *11*; α(M)=1.313×10^{-5} *19*; α(N)=1.86×10^{-6} *3* α(O)=1.285×10^{-7} *18* B(E3)(W.u.)=0.0523 *20*
3842.34	2+	1656.05 *11*	17.0 *15*	2186.273	2+	M1+E2	+1.1	3.72×10^{-4} *10*	α(K)=0.000208 *5*; α(L)=2.27×10^{-5} *5*; α(M)=3.93×10^{-6} *8*; α(N)=5.59×10^{-7} *12*; α(O)=4.00×10^{-8} *10* B(E2)(W.u.)=10.0 *+20−23*; B(M1)(W.u.)=0.022 *5* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.
		3842.2 *10*	100.0 *15*	0	0+	E2			B(E2)(W.u.)=1.60 *+14−12* Mult.: Q from γ(θ) in (n,n′γ); M2 excluded by comparison to RUL.
3932.4		3932.3[a] *6*	100[a]	0	0+	[a]			
3958.59	5−	1219.33 *3*	53.8 *12*	2739.29	(4)−	(M1+E2)	+0.08		B(E2)(W.u.)=0.59 *+32−22*; B(M1)(W.u.)=0.128 *+29−20* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.

$^{90}_{40}Zr_{50}$-15

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ †@	I_γ †	E_f	J_f^π	Mult.‡	δ‡	α	Comments
3958.59	5^-	1639.60 *4*	100.0 *12*	2319.000	5^-	(M1+E2)	+0.06		B(E2)(W.u.)=0.14 *+7−5*; B(M1)(W.u.)=0.098 *+22−15* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.
4058.07	4^+	981.31 *7*	7.8 *15*	3076.925	4^+	(M1+E2)	−0.11		B(E2)(W.u.)=0.18 *+13−9*; B(M1)(W.u.)=0.013 *+7−5* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.
		1310.00 *18*	4.3 *14*	2747.875	3^-	[E1]			B(E1)(W.u.)=4.7×10^{-5} *+27−21*
		1318.92 *19*	2.4 *13*	2739.29	$(4)^-$	[E1]			B(E1)(W.u.)=2.6×10^{-5} *+20−14*
		1871.90 *3*	100 *3*	2186.273	2^+	E2			B(E2)(W.u.)=7.5 *+38−25* Mult.: Q from γ(θ) in (n,n′γ); M2 excluded by comparison to RUL.
4124.49	0^+	1938.26 *6*	100	2186.273	2^+				
4225.35	(4^-)	1478.02 *16*	22 *4*	2747.875	3^-				
		1485.75 *14*	100 *4*	2739.29	$(4)^-$	(M1+E2)	+0.31		B(E2)(W.u.)=10.7 *45*; B(M1)(W.u.)=0.21 *+7−5* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
		1906.50 *17*	27 *6*	2319.000	5^-	(M1+E2)	−0.57		B(E2)(W.u.)=2.1 *+11−8*; B(M1)(W.u.)=0.022 *+9−6* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
4229.05	2^+	1481.40 *6*	65 *15*	2747.875	3^-				
		2042.73 *4*	100 *12*	2186.273	2^+	M1+E2	+0.04		B(E2)(W.u.)=0.020 *+10−8*; B(M1)(W.u.)=0.050 *8*
		4229.3 *2*	28 *5*	0	0^+	E2			B(E2)(W.u.)=0.094 *+22−19* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
4232.220	(6^-)	643#e	<1.5#	3589.418	8^+				
		784#e	<0.5#	3448.230	6^+				
		1155#e	<0.4#	3076.925	4^+				
		1493#e	<0.7#	2739.29	$(4)^-$				
		1913.194# *25*	100.0# *13*	2319.000	5^-	(M1+E2)	+0.5	4.27×10^{-4} *16*	α(K)=0.000158 *3*; α(L)=1.71×10^{-5} *4*; α(M)=2.97×10^{-6} *6*; α(N)=4.23×10^{-7} *8*; α(O)=3.03×10^{-8} *7* B(E2)(W.u.)=4.0 *+34−21*; B(M1)(W.u.)=0.055 *+40−25* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
4236.96	$(1,2^+)$	929.01 *18*	7.7 *3*	3308.10	2^+				
		2050.81 *9*	27 *5*	2186.273	2^+				
		2476.22 *4*	100 *5*	1760.74	0^+				
		4237.0e *15*		0	0^+				E_γ: observed only in (p,p′γ) (1974Ce03).
4262.37	(3^+)	954.2 *1*	19.9 *17*	3308.10	2^+	(M1+E2)	+0.06		B(E2)(W.u.)=0.026 *+15−13*; B(M1)(W.u.)=0.0063 *21* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
4262.37	(3$^+$)	1185.56 *5*	41 *4*	3076.925	4$^+$	(M1+E2)	−3.1	B(E2)(W.u.)=4.6 *16*; B(M1)(W.u.)=6.3×10^{-4} *+39−26* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
		1514.8 *1*	43 *7*	2747.875	3$^-$			
		1523.07 *4*	84.7 *20*	2739.29	(4)$^-$			
		2076.20 *4*	100 *5*	2186.273	2$^+$	(M1+E2)	+0.6	B(E2)(W.u.)=0.20 *9*; B(M1)(W.u.)=0.0022 *8* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
4299.12	(5$^-$)	1559.91 *7*	50.4 *17*	2739.29	(4)$^-$	(M1+E2)	+0.34	B(E2)(W.u.)=2.9 *+13−10*; B(M1)(W.u.)=0.056 *+14−10* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
		1980.06 *8*	100.0 *17*	2319.000	5$^-$	(M1+E2)	+0.85	B(E2)(W.u.)=7.0 *+24−19*; B(M1)(W.u.)=0.035 *+11−8* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
4319.2?		2000.2[d#e] *3*	100[d#]	2319.000	5$^-$			
4331.93	4$^+$	1255.18 *3*	74.5 *21*	3076.925	4$^+$	M1+E2		B(E2)(W.u.)<99; B(M1)(W.u.)<0.15 Mult.: D+Q from γ(θ) in (n,n′γ), Δπ=no from level scheme.
		1584.25 *4*	100 *3*	2747.875	3$^-$	[E1]		B(E1)(W.u.)=0.00118 *+22−17*
		2012.9 *2*	20 *4*	2319.000	5$^-$	[E1]		B(E1)(W.u.)=1.15×10^{-4} *+30−26*
4348.10	(4$^+$)	1608.8		2739.29	(4)$^-$			
		2161.87 *3*		2186.273	2$^+$			
4375.07	7$^-$	2055.77 *7*	100	2319.000	5$^-$	E2		Mult.: Q from γ(θ) in (n,n′γ), Δπ=no from level scheme.
4426.43	0$^+$	2240.20 *5*	100	2186.273	2$^+$	[E2]		B(E2)(W.u.)=2.1 *+15−11*
4454.71	(5$^+$)	1377.74 *12*	16 *3*	3076.925	4$^+$			
		1715.73 *14*	19 *7*	2739.29	(4)$^-$			
		2135.70 *5*	100 *7*	2319.000	5$^-$			
4455.58	(2)	1707.90 *5*	75 *4*	2747.875	3$^-$	D+Q	+0.024	
		2269.40 *4*	100 *4*	2186.273	2$^+$			
4474.31	4$^+$	1726.68 *7*	100 *5*	2747.875	3$^-$	[E1]		B(E1)(W.u.)=3.1×10^{-4} *+21−16*
		1735.0	40 *5*	2739.29	(4)$^-$	[E1]		B(E1)(W.u.)=1.2×10^{-4} *+8−6*
4494.79	(3$^-$)	1747.2 *2*	5 *3*	2747.875	3$^-$			
		1755.49 *4*	100 *3*	2739.29	(4)$^-$	D+Q	−0.02	
4507.0		4506.9[a] *8*	100[a]	0	0$^+$			
4533.52	(3$^-$)	1225.3[e] *2*	17.7 *22*	3308.10	2$^+$			
		1456.78 *4*	100 *11*	3076.925	4$^+$			
		1794.15 *6*	39 *4*	2739.29	(4)$^-$	(M1+E2)	+2.0	B(E2)(W.u.)=3.4 *+23−13*; B(M1)(W.u.)=0.0025 *+23−10* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
		2347.3	14 *4*	2186.273	2$^+$			
4537.70	(4$^-$)	1460.95 *6*	63 *6*	3076.925	4$^+$			
		2218.65 *7*	100 *6*	2319.000	5$^-$	(M1+E2)	−0.36	B(E2)(W.u.)=0.24 *+18−11*; B(M1)(W.u.)=0.008 *+5−3* Mult.: D+Q from γ(θ) in (n,n′γ), non zero value of δ suggests Δπ=no.
4541.37	6$^+$	222[#]	<1.0[#]	4319.2?				
		309[#e]	<1.4[#]	4232.220	(6$^-$)	[E1]		B(E1)(W.u.)<0.0033
		952[#e]	<1.4[#]	3589.418	8$^+$	[E2]		B(E2)(W.u.)<8.6

$^{90}_{40}Zr_{50}$-17

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
4541.37	6^+	1092.97 *9*	8.1 *22*	3448.230	6^+			I_γ: other: 15.8 *13* in ^{90}Nb ε decay.
		1464[#e]	<3.7[#]	3076.925	4^+	[E2]		B(E2)(W.u.)<2.6
		2222.43 *3*	100.0 *22*	2319.000	5^-	[E1]		B(E1)(W.u.)=4.7×10^{-4} *11*
4562.02	5	1822.74 *5*	100	2739.29	$(4)^-$			
4578.93	(1)	2818.33 *10*	100 *8*	1760.74	0^+			
		4578.7 *2*	83 *8*	0	0^+			
4591.37	(3^+)	1843.70 *5*	100.0 *12*	2747.875	3^-			
		2405.18 *7*	36.6 *12*	2186.273	2^+	(M1+E2)	−0.07	B(E2)(W.u.)=0.0027 *+15−11*; B(M1)(W.u.)=0.0031 *8* Mult.: D+Q from γ(θ) in (n,n′γ); Δπ=no from level scheme.
4614.42	(6^+)	1166.24 *12*	100 *10*	3448.230	6^+			
		1537.64 *12*	75 *10*	3076.925	4^+			
		2295.5	75 *8*	2319.000	5^-			
4640.94	7,8	409[#e]	<4.2[#]	4232.220	(6^-)			
		1051.53[#] *4*	100[#] *4*	3589.418	8^+			
		1192.7[#] *1*	7.7[#] *8*	3448.230	6^+			
		2322[#e]	<3.8[#]	2319.000	5^-			
4646.7	$1,2^+$	2884.8 *13*	100 *3*	1760.74	0^+			
		4646.6 *3*	18 *3*	0	0^+			
4681.26	2^+	1933.77 *8*	100 *10*	2747.875	3^-	[E1]		B(E1)(W.u.)=7.5×10^{-4} *+23−15*
		2495.1	42 *6*	2186.273	2^+			
		4680.8 *2*	58 *8*	0	0^+	E2		B(E2)(W.u.)=0.098 *+32−21* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
4701.10	2^+	1953.26 *17*	100 *5*	2747.875	3^-	[E1]		B(E1)(W.u.)=4.0×10^{-4} *6*
		2514.76 *13*	39 *3*	2186.273	2^+			
		2940.60 *12*	95 *4*	1760.74	0^+	E2		B(E2)(W.u.)=0.88 *+15−12* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
		4701.2 *3*	19 *4*	0	0^+	E2		B(E2)(W.u.)=0.0168 *+46−40* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
4774.29		537.34 *5*	34 *3*	4236.96	$(1,2^+)$			
		2587.96 *25*	100 *3*	2186.273	2^+			
4781.81	$4,(3^-)$	2462.81 *19*	100	2319.000	5^-			
4795.6	2^+	4795.5 *3*	100	0	0^+	E2		B(E2)(W.u.)=1.3 *+10−6* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
4814.44	(3^-)	2066.95 *8*	100 *7*	2747.875	3^-	D+Q	+0.34	
		2495.5	16 *3*	2319.000	5^-			
		2628.01 *10*	16 *3*	2186.273	2^+			
4818.02	$(3,4^+)$	975.75 *15*	16 *3*	3842.34	2^+			
		2070.39 *7*	100 *3*	2747.875	3^-			
4824.21	2^+	1747.2 *2*	8 *5*	3076.925	4^+	[E2]		B(E2)(W.u.)=2.3 *+15−12*
		2638.07 *11*	100 *5*	2186.273	2^+	M1+E2		B(E2)(W.u.)<5.0; B(M1)(W.u.)<0.032 Mult.: D+Q from γ(q) in (n,n′γ), Δπ=no from level scheme.

$^{90}_{40}Zr_{50}$-18

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
4824.21	2^+	4823.9 *5*	17 *3*	0	0^+	[E2]			B(E2)(W.u.)=0.031 *9*
4840.27	5^-	1763.46 *6*	100 *6*	3076.925	4^+				
		2092.7	43 *6*	2747.875	3^-				
4867.47	5^+	1419.23 *10*	53 *5*	3448.230	6^+	M1+E2	−1.0		B(E2)(W.u.)=4.6 *+21−16*; B(M1)(W.u.)=0.0086 *+41−27* Mult.: D+Q from γ(θ) in (n,n′γ), E1+M2 excluded by comparison to RUL.
		1790.73 *8*	100 *8*	3076.925	4^+	M1+E2	+0.8		B(E2)(W.u.)=2.1 *+10−8*; B(M1)(W.u.)=0.0098 *+45−29* Mult.: D+Q from γ(θ) in (n,n′γ), E1+M2 excluded by comparison to RUL.
		2128.2	17 *7*	2739.29	$(4)^-$				
4932.6	$1,2^+$	4932.5 *4*	100	0	0^+				
4941.89	(4^+)	1865.03 *8*	100 *3*	3076.925	4^+				
		2623.0 *2*	32 *3*	2319.000	5^-	[E1]			B(E1)(W.u.)=9.2×10^{-5} *+25−17*
4992.36		1150.3	30 *3*	3842.34	2^+				
		1684.35 *8*	100 *5*	3308.10	2^+				
		2244.5 *3*	31 *3*	2747.875	3^-				
		2252.9 *2*	20 *3*	2739.29	$(4)^-$				
5059.975	7^+	518.60[#] *6*	29.0[#] *21*	4541.37	6^+				
		827.74[#] *4*	46.6[#] *7*	4232.220	(6^-)	E1[#]			α(K)=0.000371 *6*; α(L)=4.04×10^{-5} *6*; α(M)=6.99×10^{-6} *10*; α(N)=9.93×10^{-7} *14*; α(O)=7.02×10^{-8} *10*
		1470.528[#] *24*	19.3[#] *7*	3589.418	8^+				
		1611.76[#] *3*	100[#] *3*	3448.230	6^+	M1,E2[#]			α(K)=0.000220 *5*; α(L)=2.39×10^{-5} *5*; α(M)=4.14×10^{-6} *9*; α(N)=5.90×10^{-7} *13*; α(O)=4.21×10^{-8} *11*
		2741.0[#] *3*	0.31[#] *10*	2319.000	5^-	E3			α(K)=0.0001277 *18*; α(L)=1.391×10^{-5} *20*; α(M)=2.41×10^{-6} *4*; α(N)=3.43×10^{-7} *5*; α(O)=2.46×10^{-8} *4*
5068.6	$1,2^+$	5068.4 *6*	100	0	0^+				
5084.03	2,3	2336.18 *10*	100 *7*	2747.875	3^-				
		2345.7 *3*	37 *7*	2739.29	$(4)^-$				
5090.30	(3^-)	2904.03 *23*	100	2186.273	2^+				
5107.92	$(3),4^+$	2368.6		2739.29	$(4)^-$				
		2921.7 *2*		2186.273	2^+				
5112.6	3^-	2365.0 *10*	100	2747.875	3^-	(M1+E2)	−0.1		Mult.: D+Q from γ(θ) in (n,n′γ), Δπ=no from level scheme.
5164.484	$(8)^+$	524[#][e]	<3.7[#]	4640.94	7,8				
		623[#][e]	<3.7[#]	4541.37	6^+				
		932[#][e]	<22[#]	4232.220	(6^-)				
		1575.035[#] *23*	100[#] *4*	3589.418	8^+	M1,E2[#]		3.64×10^{-4} *8*	α(K)=0.000230 *5*; α(L)=2.50×10^{-5} *5*; α(M)=4.34×10^{-6} *9*; α(N)=6.17×10^{-7} *13*; α(O)=4.41×10^{-8} *11*
		1716.27[#] *3*	97[#] *4*	3448.230	6^+	(E2)[#]		3.91×10^{-4}	α(K)=0.000191 *3*; α(L)=2.08×10^{-5} *3*; α(M)=3.61×10^{-6} *5*; α(N)=5.14×10^{-7} *8*; α(O)=3.66×10^{-8} *6*

$^{90}_{40}Zr_{50}$-19

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(K)=0.000191 *3*; α(L)=2.08×10^{-5} *3*; α(M)=3.61×10^{-6} *5*; α(N)=5.14×10^{-7} *8*; α(O)=3.66×10^{-8} *6*
5164.484	(8)$^+$	2845[#e]	<0.3[#]	2319.000	5$^-$				
5171.90	(4)	2432.0 *3*	56 *5*	2739.29	(4)$^-$				
		2853.06 *14*	100 *5*	2319.000	5$^-$				
5175.8	3,4$^+$	2989.5 *3*	100	2186.273	2$^+$				
5183.61	1,2$^+$	2997.5 *2*	85 *13*	2186.273	2$^+$				
		5183.2 *3*	100 *13*	0	0$^+$				
5222.97	(4$^+$)	2483.67 *19*	100	2739.29	(4)$^-$				
5232.3		3046.0 *3*	100	2186.273	2$^+$				
5247.52	9$^+$	1658.10[b] *4*	100[b]	3589.418	8$^+$	E2(+M1)[b]	+14 *14*	3.80×10^{-4} *17*	α(K)=0.000205 *8*; α(L)=2.23×10^{-5} *7*; α(M)=3.86×10^{-6} *13*; α(N)=5.49×10^{-7} *19*; α(O)=3.91×10^{-8} *17* B(M1)(W.u.)>2.2×10^{-7}
5270.74		2531.44 *16*	100	2739.29	(4)$^-$				
5275.4	(2$^+$)	5275.2	100[@]	0	0$^+$	(E2)		1.59×10^{-3}	α(K)=2.94×10^{-5} *5*; α(L)=3.14×10^{-6} *5*; α(M)=5.44×10^{-7} *8*; α(N)=7.75×10^{-8} *11*; α(O)=5.59×10^{-9} *8* B(E2)(W.u.)=0.0072 *+12−15* Mult.: from ^{89}Y(p,γ).
5305.97	2$^+$	5305.8 *2*	100	0	0$^+$	E2			B(E2)(W.u.)=0.33 *+14−7* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
5307.75	(3$^-$,4$^+$)	2560.2 *4*	13 *5*	2747.875	3$^-$				
		2988.9 *2*	20 *4*	2319.000	5$^-$				
		3121.3 *2*	100 *7*	2186.273	2$^+$				
5312.77	1,2$^+$	3551.4[e] *6*		1760.74	0$^+$				
		5312.6 *2*		0	0$^+$				
5317.7	3$^-$	2570.2 *4*	100 *12*	2747.875	3$^-$				
		3131.2 *4*	72 *12*	2186.273	2$^+$	[E1]			B(E1)(W.u.)=2.5×10^{-5} *11*
5359.22	3,4	2282.4 *2*	100	3076.925	4$^+$				
5379.8	(4$^+$)	3193.6 *3*	100	2186.273	2$^+$	[E2]			B(E2)(W.u.)=3.6 *+9−6*
5426.01	3$^-$	2118.1 *2*	100 *18*	3308.10	2$^+$	[E1]			B(E1)(W.u.)=3.3×10^{-4} *+13−10*
		3106.8 *2*	80 *14*	2319.000	5$^-$	E2			B(E2)(W.u.)=0.60 *+24−18* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
		3239.7 *2*	28 *6*	2186.273	2$^+$	[E1]			B(E1)(W.u.)=2.6×10^{-5} *+11−9*
5432.790	7$^+$,8$^+$	268[#e]	<0.6[#]	5164.484	(8)$^+$				
		792.05[#] *19*	1.5[#] *5*	4640.94	7,8				
		891[#e]	<8.3[#]	4541.37	6$^+$				
		1057.8[#] *1*	2.5[#] *8*	4375.07	7$^-$				

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
5432.790	7$^+$,8$^+$	1201[#][e]	<2.7[#]	4232.220	(6$^-$)				
		1843.342[#] *22*	100.0[#] *24*	3589.418	8$^+$	M1,E2[#]		4.08×10^{-4} *14*	α(K)=0.000170 *4*; α(L)=1.84×10^{-5} *4*; α(M)=3.19×10^{-6} *6*; α(N)=4.54×10^{-7} *9*; α(O)=3.25×10^{-8} *8*
		1984.54[#] *3*	99[#] *4*	3448.230	6$^+$				
		3114[#][e]	<0.24[#]	2319.000	5$^-$				
5437.33	2$^+$	2690.08 *23*	100 *3*	2747.875	3$^-$	[E1]			B(E1)(W.u.)=4.5×10^{-4} *7*
		3676.6 *2*	34 *3*	1760.74	0$^+$	E2			B(E2)(W.u.)=0.30 *+6−4* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
		5436.9 *2*	29.1 *18*	0	0$^+$	E2			B(E2)(W.u.)=0.037 *+7−5* Mult.: Q from γ(θ) in (n,n′γ), M2 excluded by comparison to RUL.
5457.70	(4$^+$)	2380.6 *3*	52 *17*	3076.925	4$^+$				
		2710.2 *2*	100 *17*	2747.875	3$^-$	[E1]			B(E1)(W.u.)=9.6×10^{-5} *12*
5504.75		3744.5 *5*	100 *5*	1760.74	0$^+$				
		5504.5 *2*	75 *5*	0	0$^+$				
5513.41	(3,4)	2436.5 *3*	53 *13*	3076.925	4$^+$				
		2765.8 *2*	100 *13*	2747.875	3$^-$				
5564.2		3377.9 *4*	100	2186.273	2$^+$				
5590.58	2$^+$	2842.9 *2*	35 *6*	2747.875	3$^-$	[E1]			B(E1)(W.u.)=1.68×10^{-4} *+36−31*
		3404.1 *2*	100 *5*	2186.273	2$^+$				
		5590.9 *3*	57 *3*	0	0$^+$	E2			B(E2)(W.u.)=0.081 *+13−11* Mult.: Q from γ(θ) in (n,n′γ), Δπ=no from level scheme.
5601.8		3415.5 *4*	100	2186.273	2$^+$				
5607.6		2299.5 *3*	100	3308.10	2$^+$				
5644.02	10$^+$	2054.55[b] *5*	100[b]	3589.418	8$^+$	E2[b]		4.88×10^{-4}	α(K)=0.0001368 *20*; α(L)=1.484×10^{-5} *21*; α(M)=2.57×10^{-6} *4*; α(N)=3.66×10^{-7} *6*; α(O)=2.62×10^{-8} *4* B(E2)(W.u.)>0.023
5651.1		2911.8 *3*	100	2739.29	(4)$^-$				
5724.3		3538.0 *4*	100	2186.273	2$^+$				
5775.1		3588.8 *5*	100	2186.273	2$^+$				
5785.0		5784.8[a] *4*	100[a]	0	0$^+$				
5792.05	(9$^+$)	2202.603[b] *30*	100[b]	3589.418	8$^+$	(M1+E2)[b]	−0.07 *4*	5.03×10^{-4}	α(K)=0.0001227 *18*; α(L)=1.327×10^{-5} *19*; α(M)=2.30×10^{-6} *4*; α(N)=3.28×10^{-7} *5*; α(O)=2.36×10^{-8} *4* δ: from γ(θ) and γ(lin pol) in (^{18}O,4nγ).
5808		5807.7[a] *3*	100[a]	0	0$^+$				

$^{90}_{40}Zr_{50}$-21

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
5821.8		3635.5 *6*	100	2186.273	2^+				
5846.4		3660.1 *5*	100	2186.273	2^+				
5884.4		5884.2[a] *4*	100[a]	0	0^+				
6279.70	11^+	1032.19[b] *10*	100[b] *4*	5247.52	9^+	E2[b]		6.24×10^{-4}	α(K)=0.000551 *8*; α(L)=6.11×10^{-5} *9*; α(M)=1.060×10^{-5} *15*; α(N)=1.502×10^{-6} *21* α(O)=1.050×10^{-7} *15*
6296	1^-	6295.6[a] *2*	100[a]	0	0^+	E1[a]			
6376.10	(10^-)	584.04[b] *8*	[b]	5792.05	(9^+)				
		1128.2[b] *7*	[b]	5247.52	9^+				
6389.8	1	6389.6[a] *3*	100[a]	0	0^+	D[a]			
6424.3	1^-	6424.1[a] *3*	100[a]	0	0^+	E1[a]			
6565.7	1	6565.4[a] *3*	100[a]	0	0^+	D[a]			
6640.1	(2^+)	6640.1	100[@]	0	0^+	(E2)			B(E2)(W.u.)=0.087 *+34−22* Mult.: From ^{89}Y(p,γ).
6669.2	1	6668.9[a] *7*	100[a]	0	0^+	D[a]			
6721.11	(10^-)	345.24[b] *20*	100[b] *8*	6376.10	(10^-)				
		441.42[be] *13*	≤11.6[b]	6279.70	11^+				
		929.03[be] *9*	≤23.3[b]	5792.05	(9^+)				
		1077.06[be] *8*	≤23.3[b]	5644.02	10^+				
		1473.65[b] *20*	45[b] *5*	5247.52	9^+				
		1556.63[be] *9*	≤17.4[b]	5164.484	$(8)^+$				
6761.4	1^-	6761.1[a] *2*	100[a]	0	0^+	E1[a]			
6769.51	(12^+)	489.81[b] *15*	100[b]	6279.70	11^+	(M1+E2)[b]	−0.26 *6*	0.00342 *6*	α(K)=0.00302 *5*; α(L)=0.000337 *6*; α(M)=5.86×10^{-5} *11*; α(N)=8.31×10^{-6} *15*; α(O)=5.85×10^{-7} *10*
6876	1^-	6876[a] *3*	100[a]	0	0^+	E1[a]			
6953.94	$(11)^-$	1309.83[b] *7*	100[b]	5644.02	10^+	E1(+M2)[b]	+0.02 *2*	2.90×10^{-4} *5*	α(K)=0.0001560 *23*; α(L)=1.687×10^{-5} *25*; α(M)=2.92×10^{-6} *5*; α(N)=4.15×10^{-7} *7*; α(O)=2.96×10^{-8} *5* B(E1)(W.u.)>5.3×10^{-6} δ: from γ(θ) in γ(lin pol) in (^{18}O,4nγ).
6960.4	1	6960.1[a] *7*	100[a]	0	0^+	D[a]			
7008.63	(11^-)	54.66[b] *5*	11.9[b] *17*	6953.94	$(11)^-$				
		287.55[b] *7*	100[b] *3*	6721.11	(10^-)	M1+E2[b]	−0.07 *5*	0.01235 *21*	α(K)=0.01087 *19*; α(L)=0.001231 *23*; α(M)=0.000214 *4*; α(N)=3.03×10^{-5} *6*;

$^{90}_{40}Zr_{50}$-22

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(O)=2.13×10^{-6} *4* δ: from γ(θ) in γ(lin pol) in (^{18}O,4nγ).
7008.63	(11$^-$)	1364.73[b] *20*	73[b] *3*	5644.02	10$^+$	(E1(+M2))[b]	−0.01 *2*	3.12×10^{-4}	α(K)=0.0001452 *21*; α(L)=1.569×10^{-5} *23*; α(M)=2.72×10^{-6} *4*; α(N)=3.86×10^{-7} *6*; α(O)=2.75×10^{-8} *4* δ: from γ(θ) in γ(lin pol) in (^{18}O,4nγ).
7025.59	(10$^+$)	1233.54[b] *10*	28[b] *4*	5792.05	(9$^+$)				
		1381.78[b] *30*	9.6[b] *10*	5644.02	10$^+$				
		1778.10[b] *7*	100[b] *10*	5247.52	9$^+$				
		1861.37[b] *30*	26.8[b] *13*	5164.484	(8)$^+$	(E2)[b]		4.26×10^{-4}	α(K)=0.0001642 *23*; α(L)=1.785×10^{-5} *25*; α(M)=3.09×10^{-6} *5*; α(N)=4.40×10^{-7} *7*; α(O)=3.14×10^{-8} *5*
7042.0	1	7041.7[a] *7*	100[a]	0	0$^+$	D[a]			
7085.6	(1)	7085.3[a] *10*	100[a]	0	0$^+$	(D)[a]			
7194.35	(11$^+$)	168.760[b] *4*	44.5[b] *15*	7025.59	(10$^+$)	M1+E2[b]		0.11 *6*	α(K)=0.09 *5*; α(L)=0.012 *8*; α(M)=0.0022 *13*; α(N)=0.00030 *18*; α(O)=1.6×10^{-5} *8* B(E2)(W.u.)>0.0017; B(M1)(W.u.)>4.5×10^{-8}
		818.23[b] *5*	100.0[b] *29*	6376.10	(10$^-$)	E1(+M2)[b]	−0.02 *4*	4.30×10^{-4} *10*	α(K)=0.000380 *9*; α(L)=4.15×10^{-5} *10*; α(M)=7.18×10^{-6} *16*; α(N)=1.019×10^{-6} *23*; α(O)=7.20×10^{-8} *16* B(E1)(W.u.)>1.3×10^{-5} δ: from γ(θ) and γ(lin pol) in (^{18}O),4nγ).
		1402.27[b] *7*	<1.5[b]	5792.05	(9$^+$)				
		1550.27[b] *30*	5.1[b] *5*	5644.02	10$^+$	D			
7198.2	1	7197.9[a] *6*	100[a]	0	0$^+$	D[a]			
7223.89	(12)$^+$	29.57 *8*	18 *3*	7194.35	(11$^+$)	(M1)		6.74 *11*	α(K)=5.90 *10*; α(L)=0.702 *12*; α(M)=0.1222 *20*; α(N)=0.0172 *3*; α(O)=0.001165 *19* B(M1)(W.u.)=0.90 *+19−16*
		215.27 *4*	47 *4*	7008.63	(11$^-$)	[E1]			B(E1)(W.u.)=9.3×10^{-5} *+24−16*
		269.93 *5*	100 *3*	6953.94	(11)$^-$	E1(+M2)	−0.02 *3*	0.00651 *16*	α(K)=0.00575 *14*; α(L)=0.000638 *17*; α(M)=0.000110 *3*; α(N)=1.55×10^{-5} *5*; α(O)=1.06×10^{-6} *3* B(E1)(W.u.)=1.00×10^{-4} *+22−16* δ: from γ(θ) and γ(lin pol) in (^{18}O),4nγ).
		1580.00 *30*	2.5 *3*	5644.02	10$^+$	(E2)		3.70×10^{-4}	α(K)=0.000225 *4*; α(L)=2.45×10^{-5} *4*; α(M)=4.25×10^{-6} *6*; α(N)=6.04×10^{-7} *9*;

$^{90}_{40}Zr_{50}$-23

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(K)=0.000225 *4*; α(L)=2.45×10^{-5} *4*; α(M)=4.25×10^{-6} *6*; α(N)=6.04×10^{-7} *9*; α(O)=4.29×10^{-8} *6* B(E2)(W.u.)=3.5×10^{-4} *+9−7*
7250	1$^-$	7248.9[a] *3*	100[a]	0	0$^+$	E1[a]			
7280.9		7280.6[a] *7*	100[a]	0	0$^+$				
7361.0	1	7360.8[a] *6*	100[a]	0	0$^+$	D[a]			
7387.6	1	7387.3[a] *4*	100[a]	0	0$^+$	D[a]			
7424.5		7424.2[a] *10*	100[a]	0	0$^+$				
7433.8	1	7433.5[a] *8*	100[a]	0	0$^+$	D[a]			
7437.82	(13)$^+$	213.93[b] *4*	100[b]	7223.89	(12)$^+$	M1+E2[b]	−0.07 *3*	0.0264 *5*	α(K)=0.0232 *4*; α(L)=0.00265 *5*; α(M)=0.000461 *8*; α(N)=6.53×10^{-5} *12*; α(O)=4.55×10^{-6} *7* B(E2)(W.u.)=9×10^{1} *+9−6*; B(M1)(W.u.)=0.75 *+16−11* δ: from γ(θ) and γ(lin pol) in (^{18}O),4nγ).
7468		7468[a] *2*	100[a]	0	0$^+$				
7474.9	(1)	7474.6[a] *3*	100[a]	0	0$^+$	(D)[a]			
7649.9	(2$^+$)	7649.6	100	0	0$^+$	(E2)			B(E2)(W.u.)=0.00164 *24* E_γ,I_γ,Mult.: from ^{89}Y(p,γ).
7685.8	1	7685.4[a] *4*	100[a]	0	0$^+$	D[a]			
7702.9	1$^-$	7702.5[a] *3*	100[a]	0	0$^+$	E1[a]			
7723.1		7722.7[a] *9*	100[a]	0	0$^+$				
7759.7	(1)	7759.3[a] *6*	100[a]	0	0$^+$	(D)[a]			
7779.0	1	7778.6[a] *6*	100[a]	0	0$^+$	D[a]			
7807.9	1	7807.5[a] *3*	100[a]	0	0$^+$	D[a]			
7857.8	(1)	7857.4[a] *7*	100[a]	0	0$^+$	(D)[a]			
7935.6	1	7935.2[a] *3*	100[a]	0	0$^+$	D[a]			
7976.6	1	7976.2[a] *4*	100[a]	0	0$^+$	D[a]			
8006.9	1	8006.5[a] *8*	100[a]	0	0$^+$	D[a]			
8058.41	(14)$^+$	620.58[b] *8*	100[b] *3*	7437.82	(13)$^+$	M1+E2	−0.14 *5*	0.00209 *16*	α(K)=0.00184 *14*; α(L)=0.000208 *19*; α(M)=3.6×10^{-5} *4*; α(N)=5.1×10^{-6} *5*; α(O)=3.52×10^{-7} *22* B(E2)(W.u.)=17 *+24−11*; B(M1)(W.u.)=0.32 *+27−11* δ: from γ(θ) and γ(lin pol) in (^{18}O),4nγ).
		834.51[e] *8*	<1.35	7223.89	(12)$^+$				
		1288.90[e] *21*	<1.35	6769.51	(12$^+$)				
8067.4	(1)	8067.0[a] *5*	100[a]	0	0$^+$	(D)[a]			
8110	1$^-$	8109.6[a] *8*	100[a]	0	0$^+$	E1[a]			
8131	(1$^-$)	8131.5[a] *4*	100[a]	0	0$^+$	(E1)[a]			
8144		8144[a] *2*	100[a]	0	0$^+$	[a]			
8166.7	(1)	8166.3[a] *5*	100[a]	0	0$^+$	(D)[a]			

$^{90}_{40}Zr_{50}$-24

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
8221.2	1	8220.8[a] *8*	100[a]	0	0^+	D[a]		
8235.6	1	8235.2[a] *3*	100[a]	0	0^+	D[a]		
8250.7	1	8250.3[a] *5*	100[a]	0	0^+	D[a]		
8295.3	(1)	8294.9[a] *10*	100[a]	0	0^+	(D)[a]		
8313.0	1	8312.6[a] *7*	100[a]	0	0^+	D[a]		
8334.1	1	8333.7[a] *5*	100[a]	0	0^+	D[a]		
8357.5	1	8357.1[a] *18*	100[a]	0	0^+	D[a]		
8382.1	(1)	8381.7[a] *10*	100[a]	0	0^+	(D)[a]		
8403.7		8403.3[a] *11*	100[a]	0	0^+			
8413.5	1	8413.1[a] *4*	100[a]	0	0^+	D[a]		
8440.6	1	8440.2[a] *4*	100[a]	0	0^+	D[a]		
8467.7		8467.3[a] *15*	100[a]	0	0^+			
8501.2	1^-	8500.8[a] *4*	100[a]	0	0^+	E1[a]		
8518		8518[a] *3*	100[a]	0	0^+			
8544		8544[a] *4*	100[a]	0	0^+			
8553.5	1	8553.1[a] *12*	100[a]	0	0^+	D[a]		
8588.3	1	8587.9[a] *7*	100[a]	0	0^+	D[a]		
8598.2	1	8597.8[a] *10*	100[a]	0	0^+	D[a]		
8625.6	1	8625.2[a] *10*	100[a]	0	0^+	D[a]		
8664.1	1	8663.7[a] *5*	100[a]	0	0^+	D[a]		
8716.6	1^-	8716.1[a] *5*	100[a]	0	0^+	E1[a]		
8751.0	1	8750.5[a] *8*	100[a]	0	0^+	D[a]		
8760.4	1	8759.9[a] *5*	100[a]	0	0^+	D[a]		
8812.0	1	8811.5[a] *13*	100[a]	0	0^+	D[a]		
8833.2	1	8832.7[a] *8*	100[a]	0	0^+	D[a]		
8874.9	1	8874.4[a] *9*	100[a]	0	0^+	D[a]		
8903.0		8902.5[a] *8*	100[a]	0	0^+			
8927.4		8926.9[a] *4*	100[a]	0	0^+			
8958.13	$(15)^-$	899.71[b] *20*	100[b]	8058.41	$(14)^+$	E1[b]	3.71×10^{-4} *18*	α(K)=0.000328 *16*; α(L)=3.58×10^{-5} *18*; α(M)=6.2×10^{-6} *4*; α(N)=8.8×10^{-7} *5*; α(O)=6.2×10^{-8} *4* B(E1)(W.u.)=9×10^{-4} *+9−4*
		1520.29[b] *22*	<1[b]	7437.82	$(13)^+$			
8978.4	(1)	8977.9[a] *9*	100[a]	0	0^+	(D)[a]		
8985		8985[a] *2*	100[a]	0	0^+			
9004.7	1	9004.2[a] *5*	100[a]	0	0^+	D[a]		
9014.0		9013.5[a] *8*	100[a]	0	0^+			
9034.0		9033.5[a] *8*	100[a]	0	0^+			
9043.6	1	9043.1[a] *4*	100[a]	0	0^+	D[a]		

$^{90}_{40}Zr_{50}$-25

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
9053.5		9053.0[a] *7*	100[a]	0	0^+				
9085.1	1	9084.6[a] *3*	100[a]	0	0^+	D[a]			
9111.1	1	9110.6[a] *6*	100[a]	0	0^+	D[a]			
9123.6		9123.1[a] *7*	100[a]	0	0^+				
9137.5		9137.0[a] *7*	100[a]	0	0^+				
9148.5	1^-	9148.0[a] *3*	100[a]	0	0^+	E1[a]			
9164.9		9164.4[a] *7*	100[a]	0	0^+				
9177.5		9177.0[a] *5*	100[a]	0	0^+				
9187		9186[a] *3*	100[a]	0	0^+				
9196.5	(1^-)	9196.0[a] *3*	100[a]	0	0^+	(E1)[a]			
9260.5	1	9260.0[a] *6*	100[a]	0	0^+	D[a]			
9292.8	1	9292.3[a] *5*	100[a]	0	0^+	D[a]			
9309.4	1	9308.9[a] *7*	100[a]	0	0^+	D[a]			
9333.4	1^-	9332.9[a] *6*	100[a]	0	0^+	E1[a]			
9373.2		9372.8[a] *7*	100[a]	0	0^+				
9392.4	1	9391.9[a] *8*	100[a]	0	0^+	D[a]			
9409.4		9408.9[a] *11*	100[a]	0	0^+				
9424.3		9423.8[a] *10*	100[a]	0	0^+				
9444.7	1	9444.2[a] *4*	100[a]	0	0^+	D[a]			
9465.1	1	9464.6[a] *5*	100[a]	0	0^+	D[a]			
9486.8	1	9486.3[a] *4*	100[a]	0	0^+	D[a]			
9510.5	(1)	9510.0[a] *13*	100[a]	0	0^+	(D)[a]			
9524.1	1	9523.6[a] *13*	100[a]	0	0^+	D[a]			
9539.2	1	9538.7[a] *5*	100[a]	0	0^+	D[a]			
9551.4	1	9550.9[a] *6*	100[a]	0	0^+	D[a]			
9563.0	1	9562.5[a] *6*	100[a]	0	0^+	D[a]			
9609.2		9608.6[a] *7*	100[a]	0	0^+				
9625.1		9624.5[a] *8*	100[a]	0	0^+				
9640.4	1	9639.8[a] *8*	100[a]	0	0^+	D[a]			
9666.0	(1)	9665.4[a] *8*	100[a]	0	0^+	(D)[a]			
9678.3	(1^-)	9677.7[a] *7*	100[a]	0	0^+	(E1)[a]			
9686.9	1	9686.3[a] *6*	100[a]	0	0^+	D[a]			
9707.00?	(16^-)	748.87[be] *20*	100[b]	8958.13	$(15)^-$	(M1(+E2))[b]	−0.15 *15*	1.27×10^{-3} *2*	α(K)=0.001119 *17*; α(L)=0.0001234 *19*; α(M)=2.14×10^{-5} *4*; α(N)=3.04×10^{-6} *5*; α(O)=2.17×10^{-7} *4* B(E2)(W.u.)=5 *+16−4*; B(M1)(W.u.)=0.105 *+39−26*
9733.2	1	9732.6[a] *5*	100[a]	0	0^+	D[a]			
9741.7		9741.1[a] *7*	100[a]	0	0^+				
9754.0	1	9753.4[a] *6*	100[a]	0	0^+	D[a]			

$^{90}_{40}Zr_{50}$-26

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
9784.6		9784.0[a] *5*	100[a]	0	0^+				
9805.4		9804.8[a] *10*	100[a]	0	0^+				
9836.01	$(15)^+$	1777.6[b] *3*	100[b]	8058.41	$(14)^+$				
9843.4	1	9842.8[a] *6*	100[a]	0	0^+	D[a]			
9855.5	1	9854.9[a] *8*	100[a]	0	0^+	D[a]			
9872.4	1	9871.8[a] *4*	100[a]	0	0^+	D[a]			
9890.7	(1)	9890.1[a] *13*	100[a]	0	0^+	(D)[a]			
9901.9		9901.3[a] *13*	100[a]	0	0^+				
9932.1	1	9931.5[a] *12*	100[a]	0	0^+	D[a]			
9962.8	1	9962.2[a] *5*	100[a]	0	0^+	D[a]			
9984.1		9983.5[a] *11*	100[a]	0	0^+				
10004.2	1	10003.6[a] *10*	100[a]	0	0^+	D[a]			
10019.6	1	10019.0[a] *11*	100[a]	0	0^+	D[a]			
10031		10030[a] *2*	100[a]	0	0^+				
10042.9	(1^-)	10042.3[a] *4*	100[a]	0	0^+	(E1)[a]			
10083.8	1	10083.2[a] *6*	100[a]	0	0^+	D[a]			
10094.2	1	10093.6[a] *7*	100[a]	0	0^+	D[a]			
10104.9	(1)	10104.3[a] *12*	100[a]	0	0^+	(D)[a]			
10123.7	1	10123.1[a] *18*	100[a]	0	0^+	D[a]			
10125.84	$(16)^+$	289.83[b] *6*	57.2[b] *23*	9836.01	$(15)^+$	M1(+E2)[b]	−0.01 *6*	0.01205 *18*	α(K)=0.01061 *16*; α(L)=0.001199 *19*; α(M)=0.000208 *4*; α(N)=2.96×10^{-5} *5*; α(O)=2.07×10^{-6} *3* B(M1)(W.u.)=0.54 *+25−14* δ: from γ(θ) and γ(lin pol) in (^{18}O,4nγ).
		1167.70[b] *20*	100[b] *4*	8958.13	$(15)^-$	E1(+M2)[b]	−0.02 *5*	2.42×10^{-4} *5*	α(K)=0.000191 *5*; α(L)=2.07×10^{-5} *5*; α(M)=3.59×10^{-6} *9*; α(N)=5.10×10^{-7} *12*; α(O)=3.63×10^{-8} *9* B(E1)(W.u.)=2.2×10^{-4} *+11−6* δ: from γ(θ) and γ(lin pol) in (^{18}O,4nγ).
		2067.4[b] *3*	<5.1[b]	8058.41	$(14)^+$				
10146.8	1	10146.2[a] *9*	100[a]	0	0^+	D[a]			
10163.4	1	10162.9[a] *8*	100[a]	0	0^+	D[a]			
10193.0	1	10192.4[a] *5*	100[a]	0	0^+	D[a]			
10216.8	1	10216.2[a] *10*	100[a]	0	0^+	D[a]			
10233		10232[a] *4*	100[a]	0	0^+				
10241	(1)	10240[a] *2*	100[a]	0	0^+	(D)[a]			
10260.9		10260.3[a] *11*	100[a]	0	0^+				
10270.0		10269.4[a] *7*	100[a]	0	0^+				

$^{90}_{40}Zr_{50}$-27

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ[†][@]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
10286.2	1	10285.6[a] *6*	100[a]	0	0^+	D[a]	
10298.3	(1)	10297.7[a] *10*	100[a]	0	0^+	D[a]	
10306.6	1	10306.0[a] *9*	100[a]	0	0^+	D[a]	
10315.1	1	10314.5[a] *4*	100[a]	0	0^+	D[a]	
10334.9	1	10334.3[a] *6*	100[a]	0	0^+	D[a]	
10361	(1)	10360[a] *2*	100[a]	0	0^+	(D)[a]	
10376.8	1	10376.2[a] *4*	100[a]	0	0^+	D[a]	
10402.5	1	10401.9[a] *9*	100[a]	0	0^+	D[a]	
10494.5	(1)	10493.8[a] *11*	100[a]	0	0^+	(D)[a]	
10507.9	1	10507.2[a] *8*	100[a]	0	0^+	D[a]	
10524.6	1	10523.9[a] *4*	100[a]	0	0^+	D[a]	
10595.0	1	10594.3[a] *7*	100[a]	0	0^+	D[a]	
10618.7	1	10618.0[a] *8*	100[a]	0	0^+	D[a]	
10638.5	1	10637.8[a] *9*	100[a]	0	0^+	D[a]	
10682.2	1	10681.5[a] *6*	100[a]	0	0^+	D[a]	
10713.2	(1)	10712.5[a] *12*	100[a]	0	0^+	(D)[a]	
10728.2	1	10727.5[a] *11*	100[a]	0	0^+	D[a]	
10764.9	(17^+)	639.0[cb] *8*	100[b] *23*	10125.84	$(16)^+$	(M1+E2)[b]	α(K)=0.00171 *12*; α(L)=0.000192 *16*; α(M)=3.3×10^{-5} *3*; α(N)=4.7×10^{-6} *4*; α(O)=3.27×10^{-7} *18* B(E2)(W.u.)>6.7×10^{-4}; B(M1)(W.u.)>2.7×10^{-7}
		928.9[b] *7*	<5.7[b]	9836.01	$(15)^+$		
		1806.7[b] *8*	<4.5[b]	8958.13	$(15)^-$		
10827.1	1	10826.4[a] *5*	100[a]	0	0^+	D[a]	
10914	(1)	10913[a] *2*	100[a]	0	0^+	(D)[a]	
10957	1	10956[a] *2*	100[a]	0	0^+	D[a]	
10987.0	1	10986.3[a] *10*	100[a]	0	0^+	D[a]	
11044		11043[a] *2*	100[a]	0	0^+		
11094.2		11093.5[a] *15*	100[a]	0	0^+		
11108.0		11107.3[a] *16*	100[a]	0	0^+		
11120.4	1	11119.7[a] *9*	100[a]	0	0^+	D[a]	
11129.2		11128.5[a] *17*	100[a]	0	0^+		
11140		11139[a] *2*	100[a]	0	0^+		
11232.4	1	11231.6[a] *7*	100[a]	0	0^+	D[a]	
11243.2	1	11242.4[a] *6*	100[a]	0	0^+	D[a]	
11337.7	1	11336.9[a] *6*	100[a]	0	0^+	D[a]	
11403.9	(18^+)	639.0[b] *8*	1.0×10^2[b] *3*	10764.9	(17^+)	(M1+E2)[b]	α(K)=0.00171 *12*; α(L)=0.000192 *16*; α(M)=3.3×10^{-5} *3*; α(N)=4.7×10^{-6} *4*; α(O)=3.27×10^{-7} *18*

Adopted Levels, Gammas (continued)

γ(^{90}Zr) (continued)

E_i(level)	J_i^π	E_γ †@	I_γ †	E_f	J_f^π	Mult.‡	δ‡	α	Comments
									α(K)=0.00171 *12*; α(L)=0.000192 *16*; α(M)=3.3×10^{-5} *3*; α(N)=4.7×10^{-6} *4*; α(O)=3.27×10^{-7} *18*
11403.9	(18$^+$)	1278.1[cb] *10*	<3.9[b]	10125.84	(16)$^+$				
11417.5	(1)	11416.7[a] *7*	100[a]	0	0$^+$	(D)[a]			
11452.2	1	11451.4[a] *10*	100[a]	0	0$^+$	D[a]			
11479.7	1	11478.9[a] *8*	100[a]	0	0$^+$	D[a]			
11501		11500[a] *3*	100[a]	0	0$^+$				
11510		11509[a] *7*	100[a]	0	0$^+$				
11531	1	11530[a] *2*	100[a]	0	0$^+$	D[a]			
11627.9		11627.1[a] *9*	100[a]	0	0$^+$				
11651.5	(1)	11650.7[a] *8*	100[a]	0	0$^+$	(D)[a]			
11777.4	1	11776.6[a] *10*	100[a]	0	0$^+$	D[a]			
11788	1	11787[a] *3*	100[a]	0	0$^+$	D[a]			
11963.3	(1)	11962.4[a] *18*	100[a]	0	0$^+$	(D)[a]			
11984	1	11983[a] *2*	100[a]	0	0$^+$	D[a]			
12020.6	1	12019.7[a] *8*	100[a]	0	0$^+$	D[a]			
12067.8	1	12066.9[a] *9*	100[a]	0	0$^+$	D[a]			
12110.7	(19$^+$)	706.8[b] *3*	100[b] *10*	11403.9	(18$^+$)	(M1(+E2))[b]	−0.3 *5*	0.00151 *8*	α(K)=0.00133 *7*; α(L)=0.000149 *9*; α(M)=2.59×10^{-5} *16*; α(N)=3.66×10^{-6} *21*; α(O)=2.55×10^{-7} *9* B(M1)(W.u.)=0.39 *+14−18* δ: from γ(θ) and γ(lin pol) in (^{18}O,4nγ).
		1345.9[b] *8*	<9.8[b]	10764.9	(17$^+$)				
12208.3	1	12207.4[a] *12*	100[a]	0	0$^+$	D[a]			
12219.6		8383[&] *6*	18	3842.34	2$^+$				
		8919[&] *6*	26	3308.10	2$^+$				
		9467[&] *6*	16	2747.875	3$^-$				
		10033[&] *6*	47	2186.273	2$^+$				
		10453[&] *6*	40	1760.74	0$^+$				
		12212[&] *6*	100	0	0$^+$				
12243.6	1	12242.7[a] *14*	100[a]	0	0$^+$	D[a]			
12496.3		12495.4[a] *18*	100[a]	0	0$^+$				
12880.3		12879.3[a] *10*	100[a]	0	0$^+$				
12964.7	(20$^+$)	854.00[b] *30*	1.0×10^2[b] *3*	12110.7	(19$^+$)				
		1560.8[b] *5*	<10.7[b]	11403.9	(18$^+$)				
13110.2	(2)$^-$	9270[&]		3842.34	2$^+$				
		9800[&]		3308.10	2$^+$				

$^{90}_{40}Zr_{50}$-29

Adopted Levels, Gammas (continued)

$\gamma(^{90}Zr)$ (continued)

E_i(level)	J_i^π	E_γ †@	E_f	J_f^π
13110.2	$(2)^-$	10360&	2747.875	3^-
		10920&	2186.273	2^+
		11350&	1760.74	0^+
		13110&	0	0^+

† From (n,n′γ), except where noted.
‡ From $\gamma(\theta)$ in (n,n′γ) except where noted.
# From ^{90}Nb ε decay.
@ From ^{89}Y(p,γ) reaction.
& From ^{89}Y(p,γ). From level energy difference for level 13110; not included in level energy fit.
a From ^{90}Zr(γ,γ').
b From ^{76}Ge(^{18}O,4nγ).
c Multiply placed.
d Multiply placed with undivided intensity.
e Placement of transition in the level scheme is uncertain.

$^{90}_{40}Zr_{50}$-30

Adopted Levels, Gammas

Level Scheme

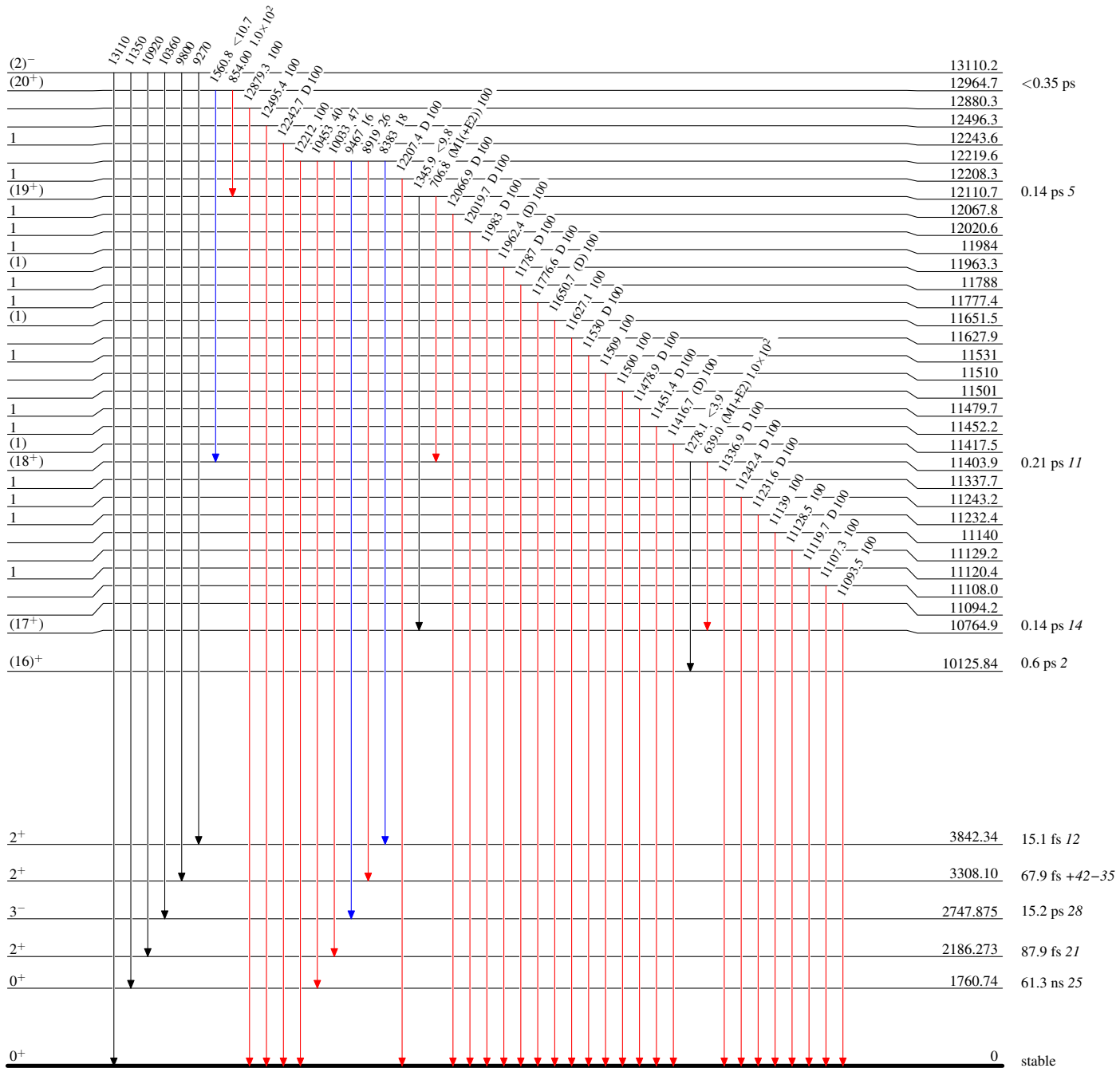
Intensities: Type not specified

Legend

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

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

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

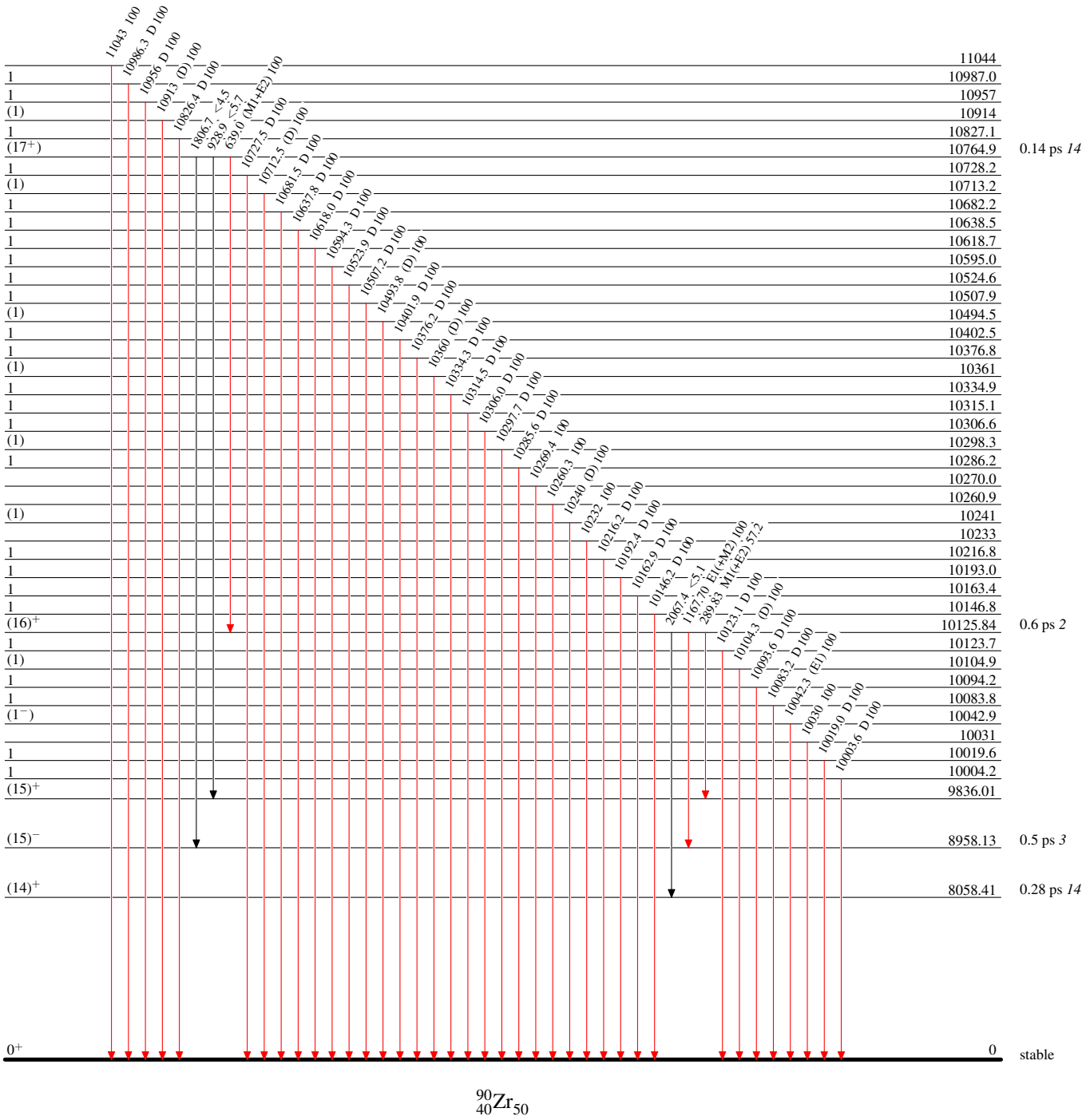


$^{90}_{40}Zr_{50}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{90}_{40}Zr_{50}$

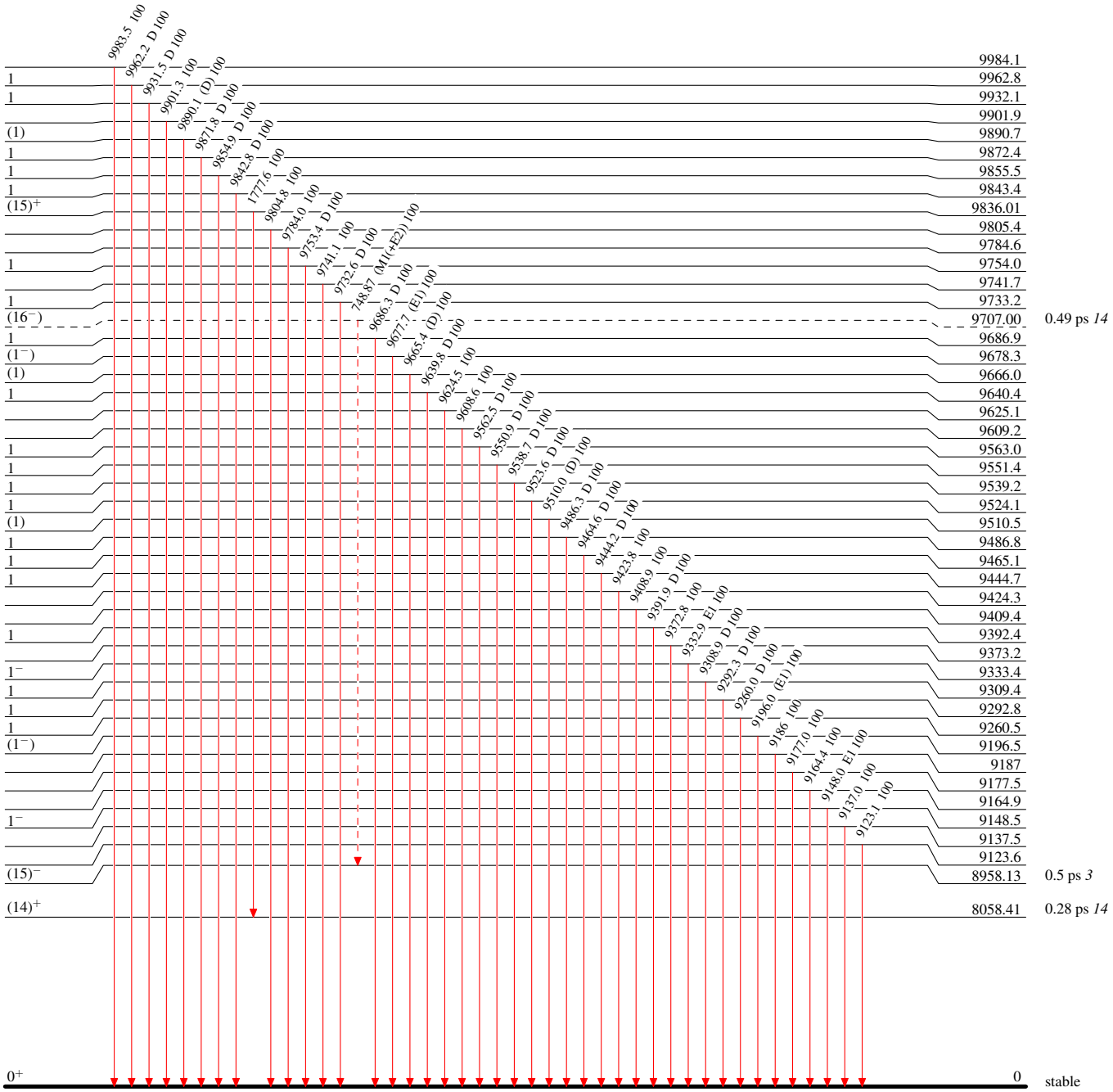
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)

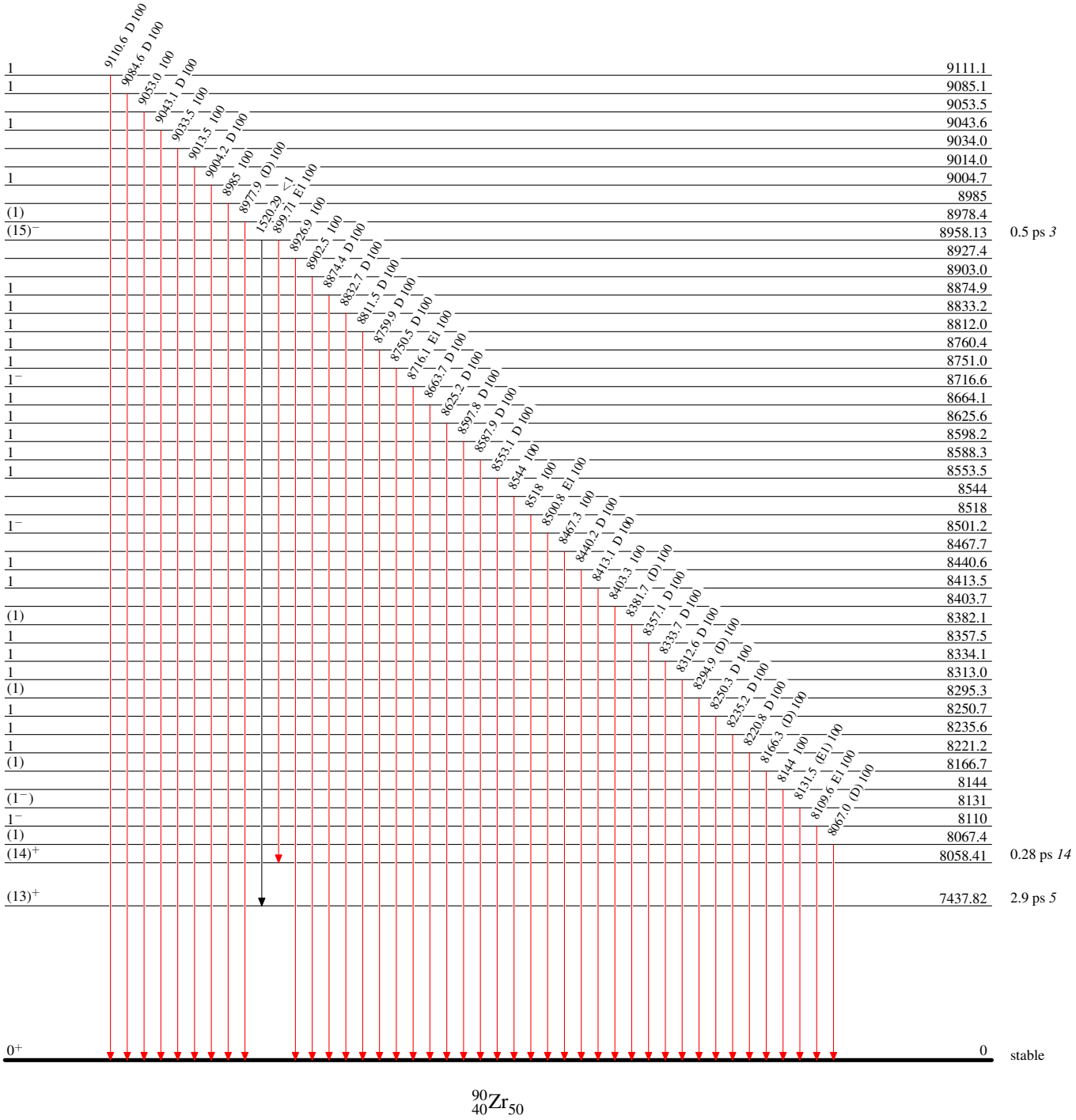


$^{90}_{40}Zr_{50}$

Adopted Levels, Gammas

Level Scheme (continued)

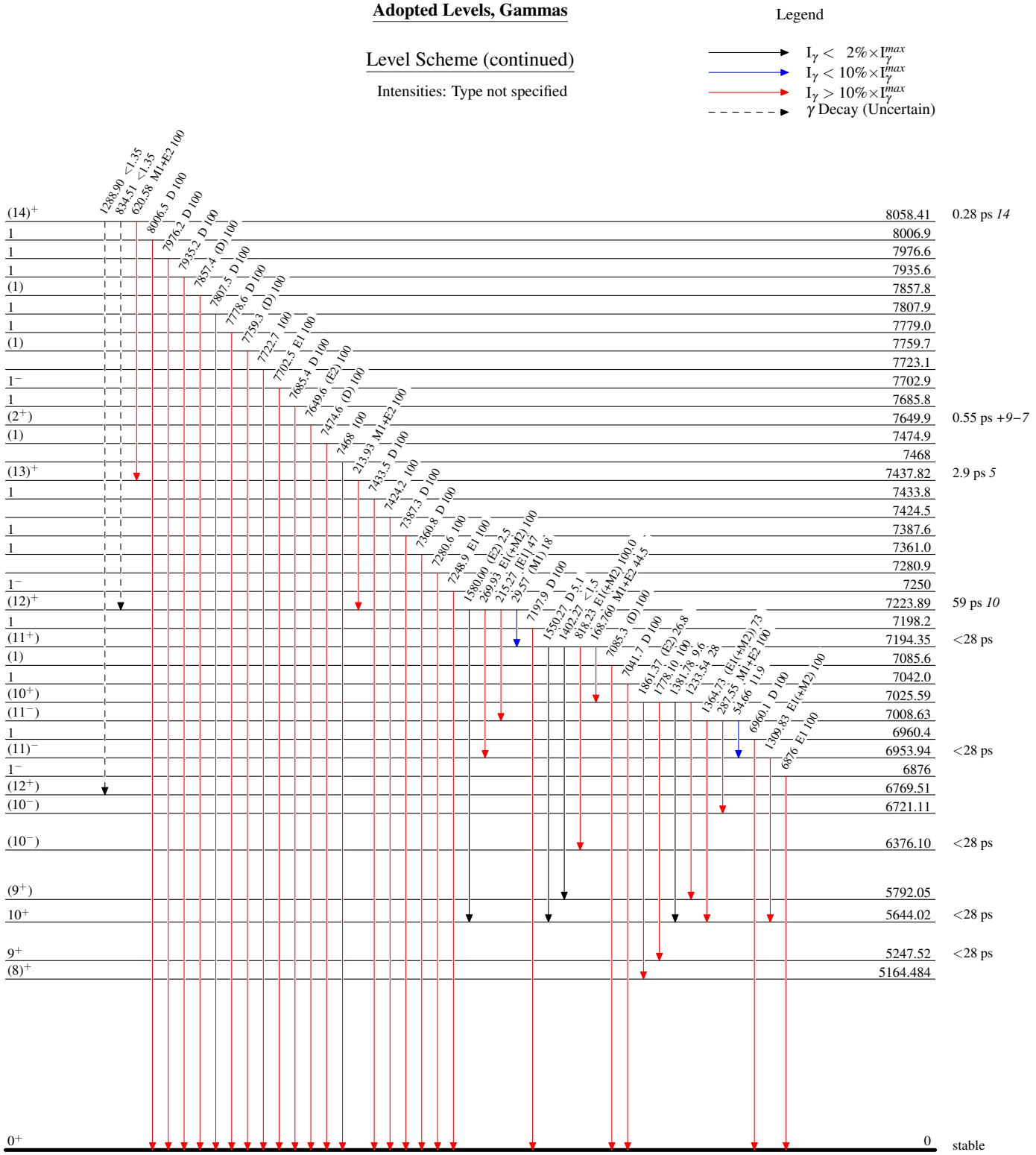
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

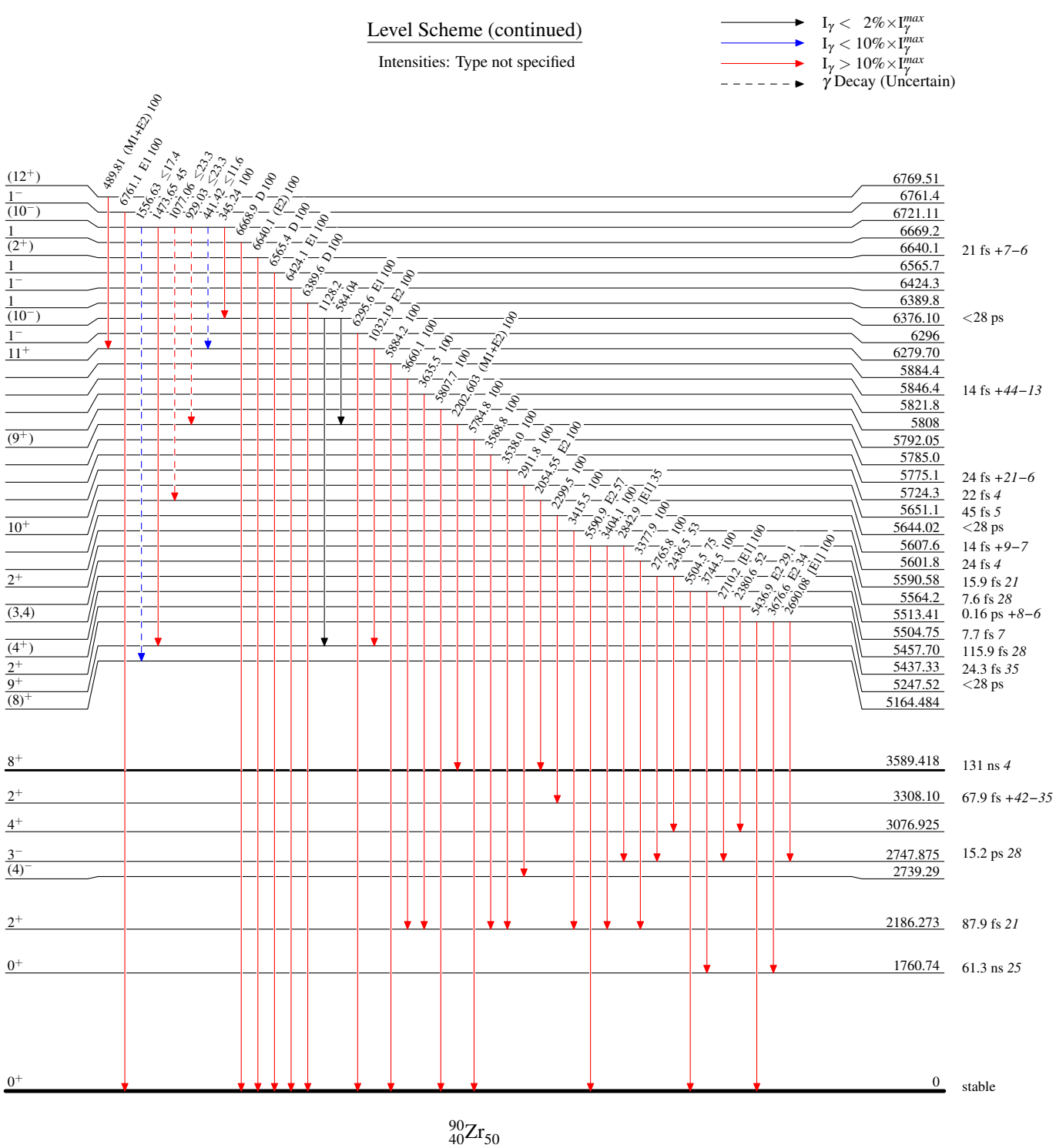


$^{90}_{40}Zr_{50}$

Adopted Levels, Gammas

Level Scheme (continued)

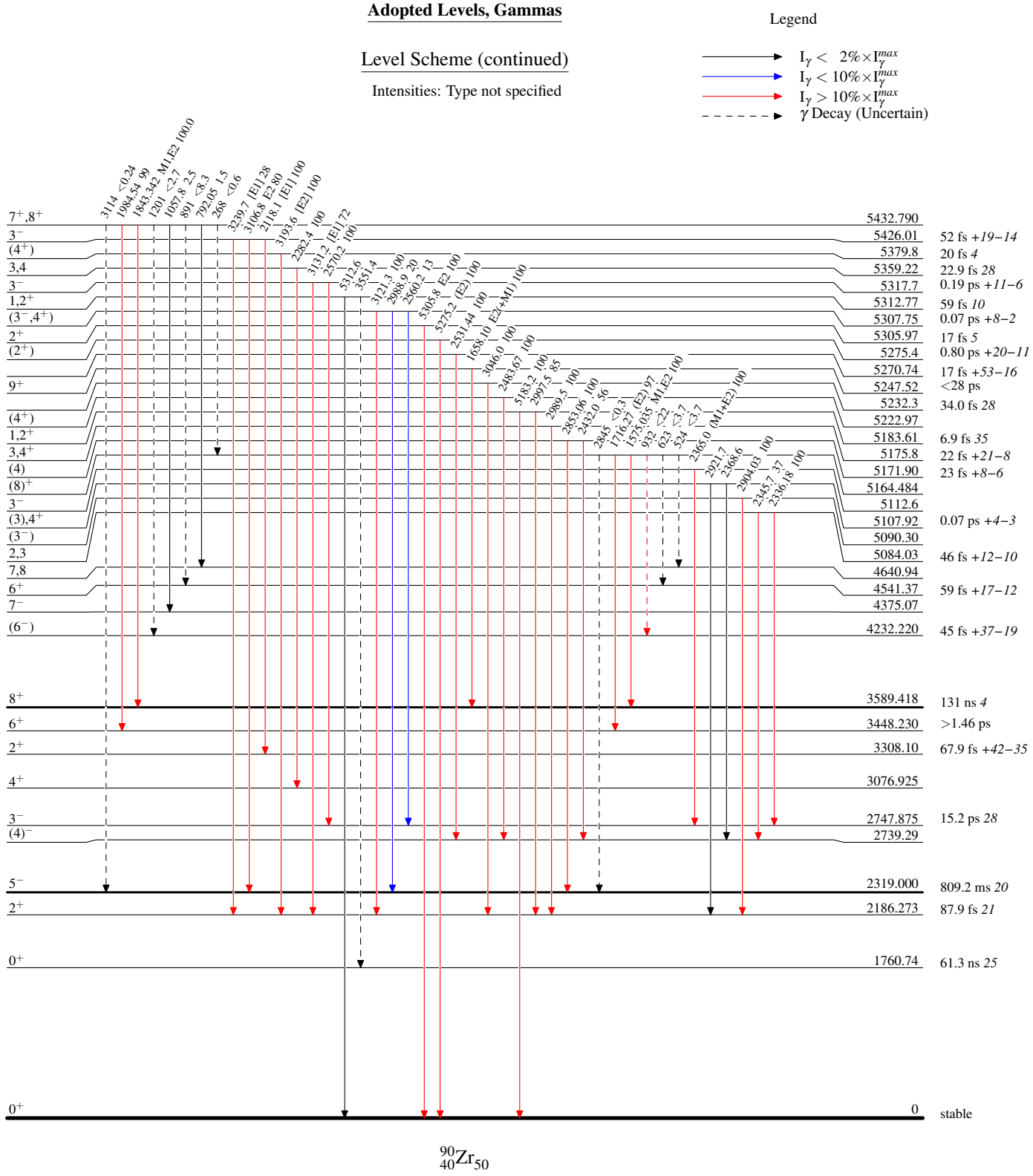
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

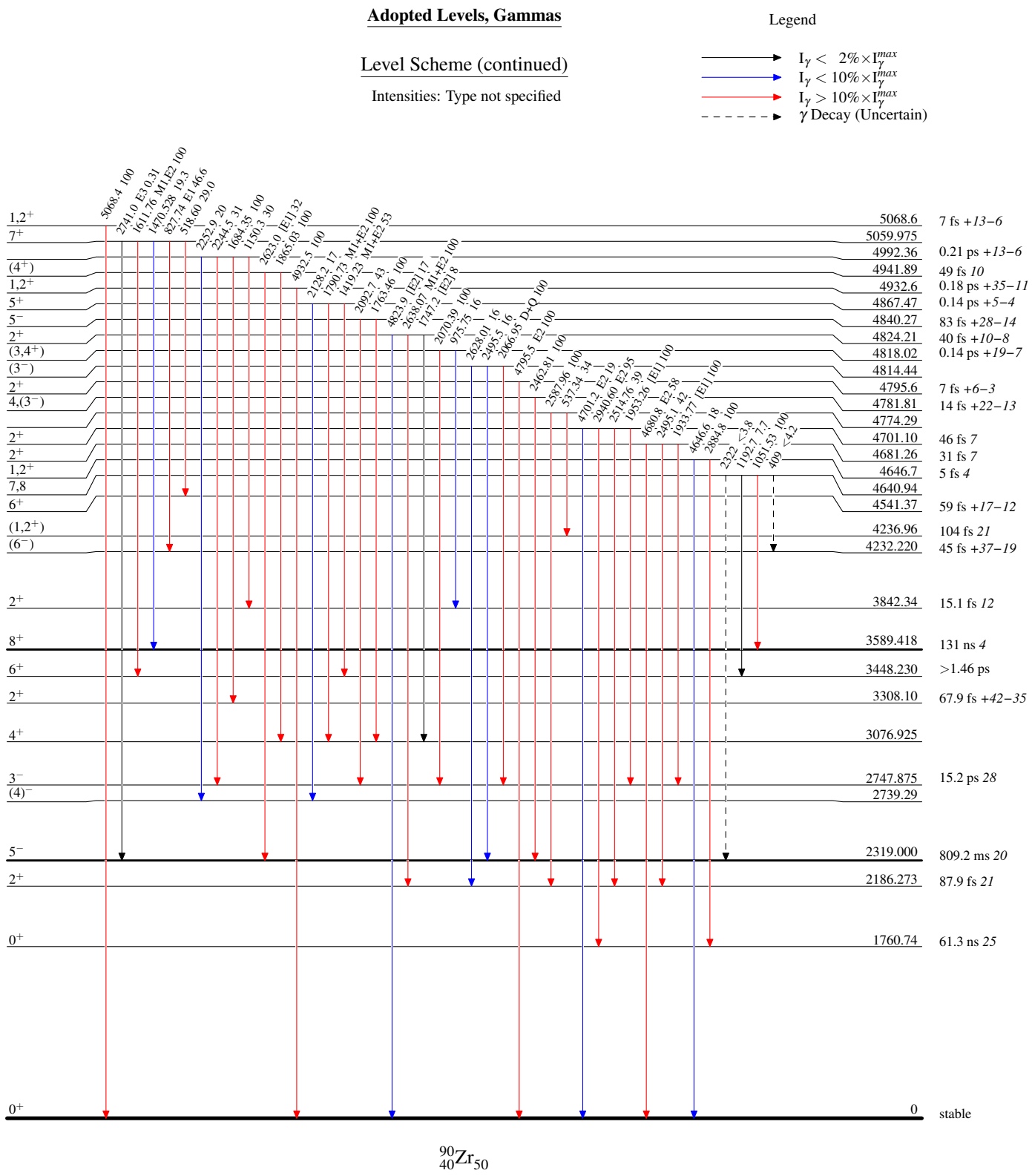
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

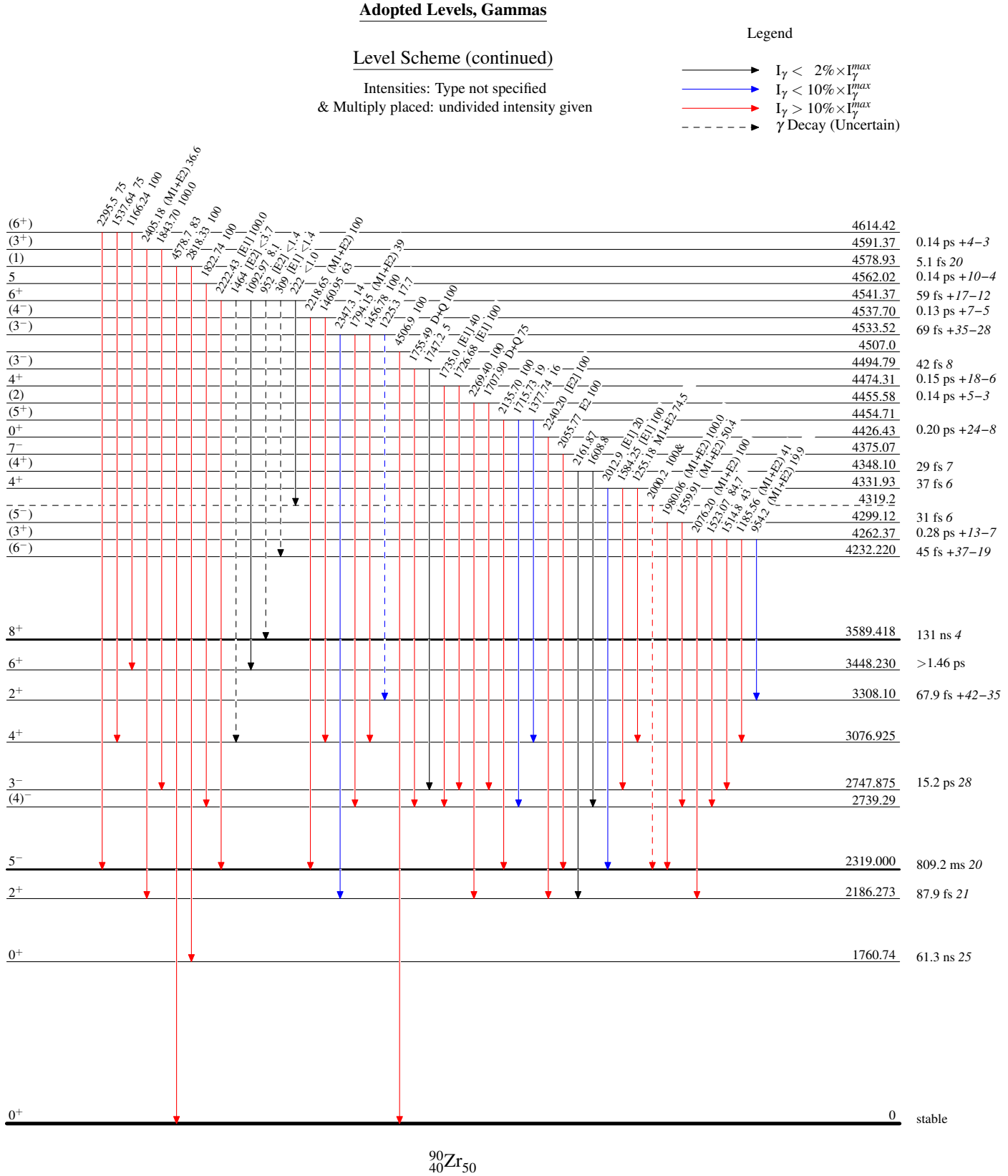


$^{90}_{40}Zr_{50}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

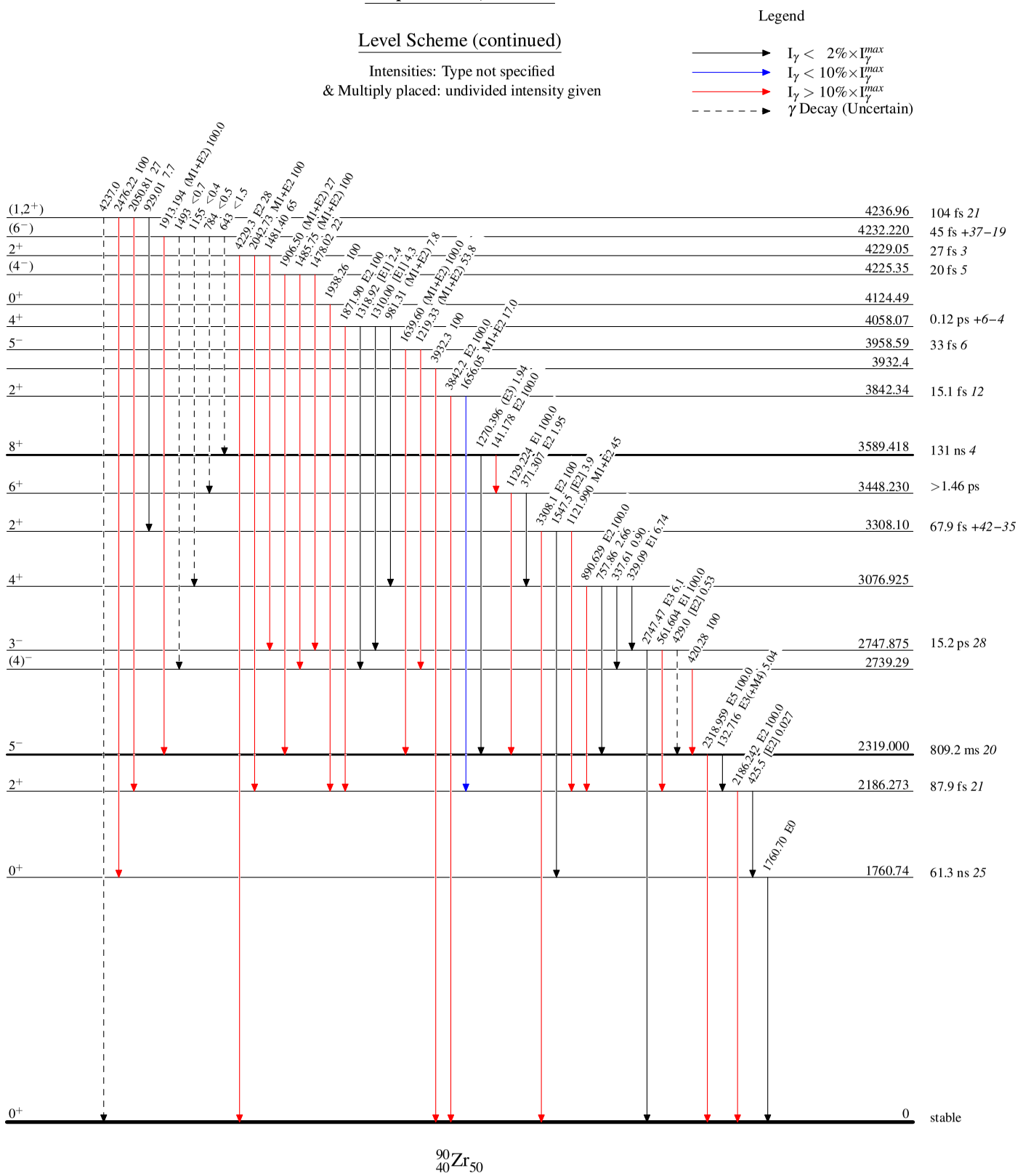


$^{90}_{40}Zr_{50}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given



$^{90}_{40}Zr_{50}$