Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

Q(β^-)=−1258 *3*; S(n)=7193.9 *4*; S(p)=8690.3 *17*; Q(α)=−5441.0 *20* 2012Wa38

Other Reactions:

^{2}H(^{90}Zr,pγ), E=360 MeV: 2007Ci05. proposed measurement of γ-rays In coincidence with (d,p) reaction protons In inverse kinematics to serve As surrogate for (n,γ) reaction (feasibility study).

^{91}Zr(α,^{3}Heγ), E=51 MeV: 2005Ch53. observed 90γ from 2260 level.

^{92}Mo(N,2pγ), E(n)≤800 MeV: 2000Ga46. 99% ^{92}Mo target, pulsed beam; 15 coaxial HPGe detectors (for Eγ≤4 MeV) and 11 planar Ge detectors (for Eγ≤1 MeV), BGO suppression shields for all planar and 9 coaxial detectors; measured 2131γ and 2170γ excitation functions for E(n)=10-250 MeV.

^{93}Nb(pol P,^{3}He), E=100.0 MeV *5*: 2000Co29. Beam polarization≈80%, 2 Si detector telescopes, particle identification, θ(lab)=15°−140°; measured double differential cross section and analyzing power for E(^{3}He)=38-90 MeV (6 energies); investigated reaction mechanism; multistep direct reaction theory.

Other measurements:

n-resonances: 2008Ta04, 2006MuZX, 2000Le01. note that neutron resonance data have not been included In Adopted Levels; please see the ^{91}Zr(n,γ) E=res dataset for these.

Charge distribution from (e,e): 1971Fa16.

Isotopic shift and mean square charge radius: 1988Ga26, 1988GaZS, 1999GaZX.

Hfs: 1993Yo11, 1999Be77, 2000Bo31, 2003Th03.

Theory (list not complete):

Nuclear structure: 2000Ho15, 1979Ch18, 1975Gl07, 1975Ip01, 1971Pa18, 1966Ve02, 1965Au04 (shell-model calculations).

Magnetic moment: 1998Jo17 (core polarization and meson exchange current), 1981Na12, 1973Va10 (core polarization), 1983Na10 (meson exchange contributions).

1989Fu05 (relativistic self-consistent calculation of baryon-meson dynamics).

n-resonances: 1987St13.

Level density: 1974So04.

Λ hyperon binding energy (2013Lo03).

^{91}Zr Levels

Cross Reference (XREF) Flags

A	^{88}Sr(α,nγ)	M	^{92}Zr(p,d)	Y	^{91}Zr(^{18}O,^{18}O′)
B	^{88}Sr(^{6}Li,2npγ)	N	^{93}Nb(d,α)	Z	^{91}Zr(^{3}He,^{3}He′), (pol ^{3}He,^{3}He)
C	^{90}Zr(n,γ) E=thermal	O	Coulomb excitation	Others:	
D	^{91}Zr(γ,γ′)	P	^{91}Zr(n,n′)	AA	^{92}Zr(pol p,d)
E	^{91}Zr(n,n′γ)	Q	^{90}Zr(^{12}C,^{11}C)	AB	^{92}Zr(^{3}He,α)
F	^{90}Zr(α,^{3}He)	R	^{90}Zr(^{13}C,^{12}C)	AC	^{93}Nb(μ^-,2nγ)
G	^{90}Zr(d,p)	S	^{90}Zr(^{13}C,^{12}Cγ)	AD	^{88}Sr(^{12}C,^{9}Be)
H	^{90}Zr(pol d,p)	T	^{90}Zr(^{16}O,^{15}O)	AE	^{90}Zr(^{20}Ne,^{19}Ne)
I	^{91}Zr(α,α′)	U	^{90}Zr(^{7}Li,^{6}Li)	AF	^{82}Se(^{13}C,4nγ)
J	^{91}Zr(d,d′)	V	^{91}Nb ε decay (6.8×10^{2} y)	AG	^{90}Zr(n,γ) E=res
K	^{91}Zr(p,p′)	W	^{91}Nb ε decay (60.86 d)	AH	^{91}Zr IT decay
L	^{92}Zr(d,t)	X	^{91}Y β^- decay		

E(level)†	J$^{\pi}$‡	T$_{1/2}$	XREF	Comments
0.0	5/2$^+$	stable	ABCDEFGHIJKLMNOPQRSTUVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH μ=−1.30362 *2*; Q=−0.176 *3* Δ<r^2>(90,91)=0.096 *11* (1988GaZS), 0.137 *16* (1999GaZX); from

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
				LASER resonance fluorescence. <r^2>$^{1/2}$(charge)=4.2844 fm *10* (2004An14). other: 4.33 (2005Bi25; read by evaluator from fig. 2). J$^{\pi}$: J=5/2 from NMR (1957Br26); L(d,p)=2. μ: From NMR (2011StZZ and 1989Ra17, from 1957Br26). Q: from 2000Ke03 and 2011StZZ, based on nuclear quadrupole coupling constants for ZrO and ZrS (1999Be77, molecular hfs) and quasirelativistic Douglas-Kroll calculations. Others: −0.206 *10* from atomic beam NMR (1989Ra17, no polarization correction; datum of 1978Bu12 revised to −0.21 *2* by 2011StZZ); −0.23 *2* (1998Bo35, quasi-free of Sternheimer correction, atomic hfs); (−)0.257 *13* (1993Yo11, atomic hfs).
1204.81 *13*	1/2^{+}	0.62 ps *14*	A CDE GHIJKLMNOP RS U WXY	XREF: Others: AA, AC J$^{\pi}$: L(p,d)=0. $T_{1/2}$: from DSAM in (α,nγ). Other $T_{1/2}$: 0.17 ps *+6−5* from DSAM in (^{13}C,^{12}Cγ); 0.8 ps *4* from B(E2)↑=0.009 *4* in Coulomb excitation. β_2=0.21 *3* from (n,n′), 0.16 from (α,α').
1466.4 *4*	5/2^{+}	0.32 ps *3*	A CDE GHIJKLMN P S	XREF: Others: AA, AC XREF: G(1471). J$^{\pi}$: L(p,d)=2; vector analyzing power in (pol p,d). $T_{1/2}$: weighted average of 0.19 ps *+11−8* from DSAM in (^{13}C,^{12}Cγ), 0.35 ps *11* from Γ=1.3×10^{-3} eV *4* in (γ,γ'), 0.32 ps *10* from DSAM in (α,nγ) and 0.34 *+4−3* from DSAM In (n,n′γ). (the unweighted average is 0.30 ps *4*). β_2=0.076 *16* from (n,n′), 0.05 from (α,α').
1882.20 *17*	7/2^{+}	76 fs *11*	A CDEFGHIJKLM P	XREF: Others: AA J$^{\pi}$: L(d,p)=4; vector analyzing power in (pol d,p). $T_{1/2}$: from Γ=6.0×10^{-3} eV *8* in (γ,γ'). others: 170 fs *70* from DSAM in (α,nγ), 73 fs *+5−4* from DSAM In (n,n′γ). β_2=0.103 *12* from (n,n′), 0.08 from (α,α').
2042.35 *19*	3/2^{+}	11.1 fs *11*	A CDEFGHIJKLMN p S U	XREF: Others: AA J$^{\pi}$: L(d,p)=2; vector analyzing power in (pol d,p). $T_{1/2}$: from Γ=41×10^{-3} eV *4* in (γ,γ'). Other $T_{1/2}$: <21 fs from DSAM in (^{13}C,^{12}Cγ); 0.07 ps *4* from DSAM in (α,nγ); 11.8 fs *14* from DSAM In (n,n′γ) (statistical uncertainty only). β_2=0.082 *11* from (n,n′).
2131.49 *15*	(9/2)$^{+}$	127 fs *17*	AB DE G JKLMN p	XREF: Others: AF, AH J$^{\pi}$: L(p,d)=4; stretched (E2) γ to 5/2^{+}. $T_{1/2}$: from Γ=3.8×10^{-3} eV *5* in (γ,γ'). others: 0.24 ps *7* from DSAM in (α,nγ); 114 fs *+12−10* from DSAM In (n,n′γ) (statistical uncertainty only). β_2=0.052 *7* from (n,n′).
2170.15 *15*	(11/2)$^{-}$	>5.5 ps	AB EfGHIJK M pQ ST Z	XREF: Others: AF XREF: f(2176). J$^{\pi}$: L(d,p)=5; L(^{16}O,^{15}O)=(6) (J$^{\pi}$=1/2^{-} ejectile); (octupole) transition to 5/2^{+}. $T_{1/2}$: from Doppler-shift attenuation observed in (^{13}C,^{12}Cγ). Note, however, that B(E3)(W.u.)(2170γ)

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				will violate RUL, unless $T_{1/2}$>105 ps.
				β_3=0.180 *15* from (n,n′). Other: (α,α′).
2189.5 *6*	(5/2)$^-$	≤1.8 ps	A DEf K n u	XREF: f(2176).
				Jπ: L(p,p′)=5; γ to 5/2$^+$; 713γ from L(p,d)=4 level at 2902. 3/2$^+$ and 5/2$^+$ favored by Hauser-Feshbach analysis of (n,n′γ) (1974Gl06) and (α,nγ) (1971Gl06), respectively.
				$T_{1/2}$: 0.9 ps *9* from Γ=0.5×10^{-3} eV *5* from (γ,γ′).
2200.5 *3*	7/2$^+$	0.33 ps *+9−6*	A DEFGH JKLMn Q u	XREF: F(2203)L(2186).
				Jπ: L(d,p)=4; D(+Q) γ to 5/2$^+$ from $\gamma(\theta)$ in (n,n′γ). Supported by J=7/2 from analyzing power in (pol d,p).
				$T_{1/2}$: from DSAM In (n,n′γ). Other: 0.41 ps *22* from Γ=1.1×10^{-3} eV *6* from (γ,γ′).
2259.92 *21*	(13/2)$^-$		AB G JK n	XREF: Others: AF
				Jπ: L(p,p′)=5 for 5/2$^+$ target; ΔJ=0,1 90γ to (11/2)$^-$ 2170; 597γ from (13/2)$^+$ 2857; (M1) 28γ from J≤15/2 *2288*.
2287.8 *3*	(15/2)$^-$	29.0 ns *8*	AB JK n	XREF: Others: AF, AH
				μ=+5.25 *8*
				μ: from TDPAD in (α,nγ) (1989Ra17 and 2011StZZ, from 1976Ba02).
				$T_{1/2}$: from DPAD In (α,nγ). Other $T_{1/2}$:≈35 ns from (^{6}Li,2npγ).
				Jπ: L(p,p′)=5 on 5/2$^+$ target; (M1) 28γ to J≤(13/2) 2260; ΔJ=0,1 859γ from (17/2)$^+$ 3147 level. μ supports configuration=((π $p_{1/2}$)(π $g_{9/2}$))5$^-$⊗(ν $d_{5/2}$)).
2320.5 *3*	(11/2)$^-$		AB EFGH JK M	XREF: Others: AH
				XREF: F(2333).
				Jπ: L(d,p)=5; 151γ to (11/2)$^-$ 2170; 570γ from (13/2)$^+$ 2857.
2356.4 *7*	(1/2)$^-$		A E G JKLMn	Jπ: L=1 in (p,d), (d,p), (d,t); Hauser-Feshbach analysis of γ excit in (α,nγ).
2366.56 *19*		105 fs *+18−14*	A CDE G JK n	Jπ: L(d,d′)=(4); L(p,p′)=3+5?; 1/2,3/2,5/2$^+$ if primary γ from 1/2$^+$ In (n,γ); 7/2$^-$ from Hauser-Feshbach analysis of (α,nγ), but fit to data is poor; γ to 5/2$^+$ g.s.
				$T_{1/2}$: from DSAM In (n,n′γ). other: 0.0702 ps *11*, 0.0936 ps *14* if J=5/2, 7/2, respectively; from ((2J+1)/(2J(g.s.)+1))×Γ_0^2/Γ=6.5×10^{-3} eV *1* in (γ,γ′), assuming Γ_0/Γ=1.
2394.9 *8*	(9/2)$^-$		A JK	Jπ: L(p,p′)=3; 9/2$^-$ from Hauser-Feshbach analysis of γ excit in (α,nγ); γ to (11/2)$^-$ 2170 level.
2534.69 *22*	(3/2$^+$,5/2$^+$)	78 fs *+19−15*	A E G JK	Jπ: L(d,p)=(2).
				$T_{1/2}$: from DSAM In (n,n′γ).
2557.8 *5*	1/2$^+$	0.13 ps *+6−4*	A CDE GH JK S	Jπ: L(d,p)=0.
				$T_{1/2}$.
				$T_{1/2}$: from Doppler-shift attenuation observed in (^{13}C,^{12}Cγ). Other: 0.19 ps *14* from Γ=2.4×10^{-3} eV *18* from (γ,γ′).
2577.9 *5*	(3/2)$^-$	84 fs *21*	A CDE G IJK MN	Jπ: L(p,p′)=3; fed by primary γ from 1/2$^+$ in (n,γ) E=thermal; γ to 5/2$^+$.
				$T_{1/2}$: 84 fs *21* if Γ=5.4×10^{-3} eV *14* from (γ,γ′).

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Other: 73 fs *+25−17* from DSAM In (n,n′γ).
				β_3≈0.21 from (α,α′).
2640.2 *4*	(3/2)⁻	92 fs *+32−21*	A CDE G JK M	Jπ: L(d,p)=1; γ to 5/2⁺. Supported by Hauser-Feshbach analysis in (α,nγ).
				$T_{1/2}$: from DSAM In (n,n′γ). Other: 0.08 ps *4* if Γ=6×10⁻³ eV *3* from (γ,γ′).
2693.7 *4*	(3/2)⁻	25 fs *4*	A CDEFGH JK MN T	Jπ: L(p,p′)=3; D(+Q) γ to 5/2⁺; L(d,p)=(1); . 3/2⁻ from Hauser-Feshbach analysis of (α,nγ), but J=5/2 or 7/2 also appears possible.
				$T_{1/2}$: if Γ=18×10⁻³ eV *3* from (γ,γ′). other: 22 fs *+6−5* from DSAM In (n,n′γ).
2764.6 *5*	(13/2,15/2)⁻		AB E JKl n	XREF: l(2766)n(2770). Jπ: L(p,p′)=5 on 5/2⁺ target; ΔJ=0,1 477γ to (15/2)⁻ 2288; 444γ to (11/2)⁻ 2321.
2775.2 *5*	(5/2)⁻	0.13 ps *+5−3*	A CDE G JKl n Z	XREF: l(2766)n(2770)Z(2770). Jπ: L(p,p′)=3; L(d,p)=(3); possible 732γ to 3/2⁺ 2042. However, 3/2⁻ favored by Hauser-Feshbach analysis of (α,nγ).
				$T_{1/2}$: from DSAM In (n,n′γ). other: 0.033 ps *24* if J=5/2; from ((2J+1)/(2J(g.s.)+1))×Γ_0^2/Γ=4×10⁻³ eV *3* in (γ,γ′), assuming Γ_0/Γ=0.54.
2791.46 *25*	(≥5/2)		A E	Jπ: 660γ to (9/2)⁺ 2131.
2810.9 *7*	(7/2⁺)	24 fs *+5−4*	A DEF H m	XREF: m(2817). Jπ: 771γ to 3/2⁺ 2042; possible 416γ (not pure E2) to (9/2)⁻ 2395; strong 2811γ branch to 5/2⁺ g.s. however, 9/2⁻ favored in Hauser-Feshbach analysis from (α,nγ), although J=5/2 or 7/2 also seem possible and (5/2⁺) is favored in (pol d,p).
				$T_{1/2}$: from DSAM In (n,n′γ). other:≈11 fs if J=7/2; from ((2J+1)/(2J(g.s.)+1))×Γ_0^2/Γ= 23×10⁻³ eV *4* in (γ,γ′), assuming Γ_0/Γ≈0.65.
2813 *3*	⁻		JK m	XREF: m(2817). E(level): weighted average of 2813 *4* from (d,d′) and 2805 *5* from (p,p′). Jπ: L=3 from (P,P′0 on 5/2⁺ target.
2826.0 *16*	3/2⁺,5/2⁺		A G L n	XREF: G(2812)L(2817)n(2826). Jπ: L(d,t)=2; L(d,p)=(2).
2835.7 *5*	(3/2,5/2,7/2)⁻		EFG IJK n	XREF: F(2847)G(2833)I(2830)J(2831)K(2832)n(2826). Jπ: L(p,p′)=3 on 5/2⁺ target; 1369γ to 5/2⁺ 1466.
				β_3≈0.22 from (α,α′).
2857.06 *25*	(13/2)⁺	≤7 ns	B JK	XREF: Others: AF, AH Jπ: L(p,p′)=4; E2 726γ to (9/2)⁺ 2131; 570γ to (15/2)⁻ 2288.
				$T_{1/2}$: from γγ coin resolving time in (^{6}Li,2npγ).
2871.5 *7*	3/2⁺		C EFGH JK	Jπ: L(d,p)=2; analyzing power in (pol d,p).
2902.3 *7*	(7/2)⁺		E G KLMn	XREF: Others: AB XREF: L(2896)ab(2940). Jπ: L(p,d)=4; 713γ to (5/2)⁻ at 2189.
2914.2 *5*	(9/2⁺)		A E JK n	XREF: Others: AB

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
				XREF: ab(2940). Jπ: 783γ to $(9/2)^+$ 2131 level; $9/2^+$ from Hauser-Feshbach analysis in (α,nγ).
2928.4 *10*	$3/2^+,5/2^+$	61 fs *+15−11*	E GH JK M	Jπ: L(d,d′)=2, L(d,p)=2. $T_{1/2}$: from DSAM In (n,n′γ).
2992.1 *7*			E l	XREF: l(2984). Jπ: γ to $7/2^+$ 2201 level.
3007.7 *8*	$5/2^-,7/2^-$	94 fs *+43−26*	A E G jKl	XREF: l(2984). Jπ: L(d,p)=3. $T_{1/2}$: from DSAM In (n,n′γ).
3017.1 *20*			A j	
3034 *3*	−		G IJKl n	XREF: l(3045). Jπ: L=3 in (p,p′), (d,d′), (α,α′). L(d,t)=(1) for 3034 and/or 3053 level(s).
3053 *5*			FG Kl n	XREF: F(3063)l(3045). Jπ: L(d,t)=(1) for 3034 and/or 3053 level(s).
3083.3 *6*	$3/2^+$	17 fs *+6−4*	A C EFGH JK	Jπ: L(d,p)=2; vector analyzing power in (pol d,p). L(d,d′)=(3) is in conflict with this assignment. $T_{1/2}$: from DSAM In (n,n′γ).
3107.9 *8*	$7/2^+,9/2^+$	38 fs *+8−6*	DE G JKLM	Jπ: L(p,d)=4. $T_{1/2}$: from DSAM In (n,n′γ). other: 76 fs *29*, 100 fs *40* if J=7/2, 9/2, respectively; from $((2J+1)/(2J(g.s.)+1))\times\Gamma_0^2/\Gamma=8\times10^{-3}$ eV *3* in (γ,γ′), assuming $\Gamma_0/\Gamma=1$.
3146.9 *3*	$(17/2)^+$	≤7 ns	B K	XREF: Others: AF, AH Jπ: ΔJ=2 E2 290γ to $(13/2)^+$ 2857; 859γ to $(15/2)^-$ 2288. $T_{1/2}$: from γγ coin resolving time in (^{6}Li,2npγ).
3167.3 *4*	$(21/2^+)$#	4.35 μs *14*	B K N	XREF: Others: AF, AH %IT=100 %IT=100 μ=+9.82 *8*; Q=(−)0.86 *5* $T_{1/2}$: from ^{6}Li-γ(t) in (^{6}Li,2npγ). Other: $T_{1/2}$=3.6 μs *1* (1985Ra09). μ: From DPAD (1989Ra17 and 2011StZZ, from 1982RaZR); relative to μ(^{90}Zr,3589). Q: From DPAD (1989Ra17 and 2011StZZ, from 1985Ra09); relative to ^{91}Zr(g.s.), no polarization correction included. Jπ: isomeric state expected with configuration=((π $1g_{9/2})^2$(ν $2d_{5/2}$))$21/2^+$ (1976Br14).
3234.8 *10*	$(3/2)^-$	27 fs *+6−5*	CDE G IJKLM	$T_{1/2}$: from DSAM In (n,n′γ). other: 0.3 ps *9* if $\Gamma=1.5\times10^{-3}$ eV *45* from (γ,γ′). Jπ: L=1 in (p,d) and (d,t); γ to $5/2^+$. L=(2) in (p,p′) and (d,d′) inconsistent with this assignment.
3262 *8*			K	
3276.6 *6*	$(3/2^-)$		EF K M	XREF: K(3283)M(3287). Jπ: L(p,d)=(1); 1810γ to $5/2^+$ 1466.
3290.4 *5*	$3/2^+$		C EFGH JK Mn	Jπ: L(d,p)=2; vector analyzing power in (pol d,p).
3312 *4*	$(^+)$		d JK n	XREF: d(3317). Jπ: L(d,d′)=(2).
3321 *4*			d JK	XREF: d(3317).
3331.1 *15*	$1/2^+$		E G KL	XREF: L(3314). Jπ: L=0 in (d,p) and (d,t).
3356 *8*			K	
3378 *6*	$(1/2^-,3/2^-)$		K M	Jπ: L(p,d)=(1).

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
3410 *8*			K	
3456 *5*	9/2−,11/2−		G K	Jπ: L(d,p)=5.
3469 *5*	7/2+		FGHijK n Q T	XREF: F(3475)i(3470)K(3466). Jπ: L(d,p)=4; vector analyzing power in (pol d,p).
3476.1 *10*	1/2−,3/2−		cd i kLMn	XREF: i(3470)k(3474)L(3468). E(level): from (p,d). Jπ: L=1 in (p,d) and (d,t).
3476.3 *8*	3/2+,5/2+		cd G ijk n	XREF: i(3470)k(3474). E(level): from (d,p). Jπ: L(d,p)=2.
3489 *4*			JK n	
3555 *6*	(7/2)+		FGH K	XREF: F(3558). Jπ: L(d,p)=4; J=(7/2) from vector analyzing power in (pol d,p).
3576.1 *10*	(3/2)−	7.6 fs *13*	D F KLM	XREF: L(3568). Jπ: L(p,d)=1; γ to 5/2+. $T_{1/2}$: if Γ=60×10−3 eV *11* from (γ,γ′).
3597 *6*	5/2−,7/2−		K MN	Jπ: L(p,d)=3.
3636 *6*	3/2+,5/2+		FG K	Jπ: L(d,p)=2.
3652 *4*	(−)		JK n	Jπ: L(p,p′)=(5).
3667 *7*			fG K n	
3681 *3*	3/2+	6.6 fs *26*	D fGH JK M	Jπ: L(d,p)=2; vector analyzing power in (pol d,p). $T_{1/2}$: if Γ=69×10−3 eV *27* from (γ,γ′).
3704 *3*	7/2+,9/2+		D JKLM	Jπ: L(p,d)=4. $T_{1/2}$: 0.024 ps *9*, 0.030 ps *12* if J=7/2, 9/2, respectively; from ((2J+1)/(2J(g.s.)+1))×Γ_0^2/Γ=25×10−3 eV *9* in (γ,γ′), assuming Γ_0/Γ=1.
3725 *8*	1/2−,3/2−		KL	XREF: L(3739). Jπ: L(d,t)=1.
3750 *4*	3/2+,5/2+		G JK Mn	Jπ: L(d,p)=2.
3776 *4*	(+)		G JK n	Jπ: L(d,d′)=(2).
3820 *4*	(7/2+,9/2+)		FG JKLM	Jπ: L(d,p)=(4).
3829 *8*			K n	
3850 *4*	(5/2)+		GH JK n	Jπ: L(d,p)=2; vector analyzing power in (pol d,p).
3884 *6*	(1/2−,3/2−)		K M	Jπ: L(p,d)=(1).
3898 *4*	7/2+,9/2+		FG JKLM	XREF: F(3917)K(3893). Jπ: L(d,p)=4.
3908 *4*	9/2−,11/2−		GH JK n	XREF: K(3903). Jπ: L(d,p)=5.
3924 *6*	3/2+,5/2+		fG K n	XREF: f(3917). Jπ: L(d,p)=2.
3949 *5*			JK	
3962 *4*	7/2+,9/2+		JKLM	XREF: L(3952). Jπ: L(p,d)=4.
3984.2 *8*	3/2+,5/2+		C G JK MN	Jπ: L(d,p)=2.
4007 *4*	7/2+,9/2+		FGH JK	XREF: F(4018)G(4018). Jπ: L(d,p)=4.
4025.6 *11*	(3/2+,5/2+)		C KLM	XREF: L(4005). Jπ: L(d,t)=2 for 4007 and/or 4024 levels; L=2 is inconsistent with adopted J(4007), suggesting it applies to the 4024 level.
4040 *4*	(3/2+,5/2+)		G JK	Jπ: L(d,p)=(2).
4070 *4*	9/2−,11/2−		fG JK M T	XREF: f(4081). Jπ: L(d,p)=5.
4114 *4*	7/2+,9/2+		fG JK N T	XREF: f(4081). Jπ: L(d,p)=4.

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
4148 *2*	$(3/2^+,5/2^+)$		G JK N	Jπ: L(d,p)=(2).
4162.4 *8*	$3/2^+,5/2^+$		C G JK	Jπ: L(d,p)=2,3; fed by primary 3033γ from $1/2^+$ In (n,γ) E=thermal.
4180.0 *6*	$1/2^{(+)},3/2,5/2^+$		C J	XREF: J(4174). Jπ: fed by primary γ from $1/2^+$ in (n,γ) E=thermal; γ to $5/2^+$ 1467.
4192 *4*	$(3/2^+,5/2,7/2^-)$		G JK	Jπ: L(d,p)=2,3.
4210 *10*	$1/2^-,3/2^-$		M	Jπ: L(p,d)=1.
4230 *8*			K	
4245 *8*			f K	XREF: f(4254).
4268 *4*	$(1/2^-,3/2^-)$		fG JK	XREF: f(4254)G(4262)J(4273)K(4265). Jπ: L(d,p)=(1).
4279 *5*	$7/2^+,9/2^+$		G JK n	XREF: G(4272)J(4287)K(4273). Jπ: L(d,p)=4.
4296 *4*	$1/2^-,3/2^-$		iJK Mn	XREF: i(4300). Jπ: L(p,d)=1.
4319.8 *8*	$3/2^-$	4.1 fs *18*	CD G i K M	XREF: i(4300). Jπ: L(d,p)=1; fed by primary γ from $1/2^+$ In (n,γ) E=thermal. $T_{1/2}$: if $\Gamma=11\times10^{-2}$ eV *5* from (γ,γ′).
4338 *5*			JK	
4354 *6*	$3/2^+,5/2^+$		G K	Jπ: L(d,p)=2.
4380 *6*	$7/2^+,9/2^+$		G K N	Jπ: L(d,p)=4.
4400 *4*	$(3/2^+,5/2^+)$		G JK M	Jπ: L(d,p)=2. However, L(d,d′)=(3) and L(p,d)=1 are in conflict with this assignment, suggesting a possible multiplet At this energy.
4414 *5*	$9/2^-,11/2^-$		G J T	Jπ: L(d,p)=5.
4437 *5*			JK n	
4450 *8*			K n	
4464 *4*	$3/2^+,5/2^+$		G JK	Jπ: L(d,p)=2.
4504 *5*	$1/2^-,3/2^-$		G J M	Jπ: L(p,d)=1.
4532.7 *11*	$3/2^+,5/2^+$		C G J n	Jπ: L(d,p)=2.
4549 *7*			J n	
4588 *5*	$(3/2^+,5/2,7/2^-)$		G J	Jπ: L(d,p)=2,3.
4611 *8*			G	
4653 *5*	$(1/2,3/2^-)$		G J	Jπ: L(d,p)=0,1.
4685 *5*	$(1/2^+,3/2^-)$		D G J	XREF: D(4674)G(4679)J(4690). Jπ: L(d,p)=0,1. Excitation in (γ,γ′). $T_{1/2}$: 3.0 fs *18*, 6 fs *3* if J=1/2, 3/2, respectively; from $((2J+1)/(2J(g.s.)+1))\times\Gamma_0^2/\Gamma=50\times10^{-3}$ eV *30* in (γ,γ′), assuming $\Gamma_0/\Gamma=1$.
4704?			D	
4712.1 *8*			D G J	XREF: Others: AF
4735 *8*	$(1/2,3/2)^-$		G MN	XREF: N(4752). Jπ: L(p,d)=1; however, L(d,p)=(3).
4786 *5*	$(^-)$		G J	Jπ: L(d,d′)=(3).
4808 *8*	$(3/2^+,5/2^+)$		G	Jπ: L(d,p)=(2).
4833 *10*	$1/2^-,3/2^-$		G M	XREF: M(4820). Jπ: L(d,p)=1.
4876 *10*			G	
4928 *10*			G	
4953 *10*	$(5/2^-,7/2^-)$		G	Jπ: L(d,p)=(3).
4989 *10*			G	
5017 *10*			G	
5095 *10*	$(1/2^-,3/2^-)$		G	Jπ: L(d,p)=(1).
5132 *10*			G N	

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	XREF	Comments
5158 *10*		G	
5176 *10*		G	
5217 *10*	(3/2+,5/2+)	G	Jπ: L(d,p)=(2).
5254 *10*		G	
5308.2 *8*			XREF: Others: AF
5312 *10*	(3/2+,5/2+)	G N	XREF: N(5294). Jπ: L(d,p)=(2).
5357 *10*		G	
5382 *10*		G	
5426 *10*		G N	XREF: N(5408).
5450 *10*		G	
5472 *10*		G	
5495.6 *9*			XREF: Others: AF
5496 *10*		G	
5530 *10*		G	
5550 *10*		G	
5598 *10*	(−)	G I N	L(α,α′)=(3).
5613.1 *8*			XREF: Others: AF
5645 *10*		G	
5674 *10*		G N	
5716 *10*		G	
5741.3 *8*			XREF: Others: AF
5744 *10*		G	
5781 *10*		G	
5804 *10*		G	
5843 *10*		G	
5877 *10*		G	
5894 *10*		G	
5933 *10*		G	
5954 *10*		G	
6003 *10*		G	
6027 *10*		G	
6081 *10*		G	
6103 *10*		G	
6156 *10*		G	
6179 *10*		G	
6210 *10*		G	
6262 *10*		G	
6297 *10*		G	
6352 *10*		G	
6390 *10*		G	
6431 *10*		G	
6457 *10*		G	
6773.2 *9*			XREF: Others: AF
7014.3 *9*			XREF: Others: AF
7194.4 *5*	1/2+	C	E(level),Jπ: thermal neutron capture state(S). S(n)=7193.9 *4* (2012Wa38).
7198.7188@ *4*	1/2@		XREF: Others: AG Γ_γ=0.0780 eV *23*, Γ_n=10.8 eV *5*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0770 eV *23* (2008Ta04).
7198.86427@ *6*	3/2@		XREF: Others: AG Γ_γ=0.250 eV *22*, Γ_n=0.089 eV *4*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.130 eV *5* (2008Ta04).
7202.0805@ *2*	3/2@		XREF: Others: AG Γ_γ=0.150 eV *5*, Γ_n=3.20 eV *19*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.287 eV *9* (2008Ta04).

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
7203.6578[@] *4*	1/2[@]		XREF: Others: AG Γ_γ=0.218 eV *8*, Γ_n=6.0 eV *4*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.211 eV *7* (2008Ta04).
7204.39652[@] *7*	1/2[@]		XREF: Others: AG Γ_γ=0.44 eV *4*, Γ_n=0.0200 eV *16*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0190 eV *14* (2008Ta04).
7206.97387[@] *2*	1/2[@]		XREF: Others: AG Γ_γ=0.241 eV *20*, Γ_n=0.0070 eV *6*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0067 eV *6* (2008Ta04).
7207.16354[@] *7*	1/2[@]		XREF: Others: AG Γ_γ=0.081 eV *8*, Γ_n=0.049 eV *4*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0310 eV *20* (2008Ta04).
7207.20615[@] *1*	1/2[@]		XREF: Others: AG Γ_γ=0.057 eV *5*, Γ_n=0.046 eV *4*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0260 eV *17* (2008Ta04).
7208.118[@] *3*	1/2[@]		XREF: Others: AG Γ_γ=0.068 eV *5*, Γ_n=30 eV *3*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0.068 eV *5* (2008Ta04).
7208.19616[@] *1*	1/2[@]		XREF: Others: AG Γ_γ=0.053 eV *4*, Γ_n=53 eV *5*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.053 eV *5* (2008Ta04).
7211.608[@] *1*	1/2[@]		XREF: Others: AG Γ_γ=0.099 eV *7*, gΓ_n=1.46 eV *15*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.092 eV *6* (2008Ta04).
7211.64354[@] *2*	1/2[@]		XREF: Others: AG Γ_γ=0.279 eV *26*, Γ_n=0.0260 eV *25*. $\Gamma_n\Gamma_\gamma/\Gamma$=0.0240 eV *20* (2008Ta04).
7211.6926[@] *1*	1/2[@]		XREF: Others: AG Γ_γ=0.246 eV *21*, Γ_n=0.020 eV *2*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0.0180 eV *17* (2008Ta04).
7212.11[@] *2*	1/2[@]		XREF: Others: AG Γ_γ=0.162 eV *12*, Γ_n=241 eV *18*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.162 eV *12* (2008Ta04).
7213.76964[@] *1*	1/2[@]		XREF: Others: AG Γ_γ=0.0200 eV *18*, Γ_n=0.105 eV *11*. $\Gamma_n\Gamma_\gamma/\Gamma$=0.0170 eV *13* (2008Ta04).
7213.788[@] *2*	1/2[@]		XREF: Others: AG Γ_γ=0.11 eV *1*, Γ_n=0.70 eV *7*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.097 eV *7* (2008Ta04).
7213.8 *9*			XREF: Others: AF
7214.396[@] *2*	1/2[@]		XREF: Others: AG Γ_γ=0.270 eV *15*, Γ_n=13.0 eV *12*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.267 eV *15* (2008Ta04).
7221.078[@] *3*	3/2[@]		XREF: Others: AG Γ_γ=0.065 eV *6*, Γ_n=1.30 eV *13*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.124 eV *10* (2008Ta04).
7221.146[@] *1*	3/2[@]		XREF: Others: AG Γ_γ=0.210 eV *13*, Γ_n=5.8 eV *6*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.410 eV *25* (2008Ta04).
7223.410[@] *3*	3/2[@]		XREF: Others: AG Γ_γ=0.150 eV *15*, Γ_n=1.10 eV *11*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.270 eV *24* (2008Ta04).
7229.867[@] *4*	1/2[@]		XREF: Others: AG Γ_γ=0.59 eV *4*, Γ_n=38 eV *4*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.58 eV *4* (2008Ta04).
7233.973[@] *3*	3/2[@]		XREF: Others: AG Γ_γ=0.180 eV *15*, Γ_n=1.30 eV *13*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.329 eV *24* (2008Ta04).
7234.86[@] *1*	1/2[@]		XREF: Others: AG Γ_γ=0.160 eV *15*, Γ_n=58 eV *6*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.162 eV *15* (2008Ta04).

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	XREF	Comments
7235.84@ *1*	3/2@		XREF: Others: AG Γ_γ=0.98 eV *5*, Γ_n=236 eV *17*, g$\Gamma_n\Gamma_\gamma/\Gamma$=1.96 eV *11* (2008Ta04).
7236.5076@ *1*	3/2@		XREF: Others: AG Γ_γ=0.040 eV *4*, Γ_n=0.20 eV *2*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.068 eV *6* (2008Ta04).
7236.65@ *6*	1/2@		XREF: Others: AG Γ_γ=0.200 eV *19*, Γ_n=285 eV *28*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.203 eV *19* (2008Ta04).
7236.888@ *6*	1/2@		XREF: Others: AG Γ_γ=0.071 eV *7*, Γ_n=0.49 eV *5*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.062 eV *5* (2008Ta04).
7237.071@ *20*	1/2@		XREF: Others: AG Γ_γ=0.200 eV *17*, Γ_n=116 eV *11*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.200 eV *17* (2008Ta04).
7239.229@ *8*	3/2@		XREF: Others: AG Γ_γ=0.310 eV *22*, Γ_n=83 eV *8*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.63 eV *5* (2008Ta04).
7247.579@ *7*	1/2@		XREF: Others: AG Γ_γ=0.0250 eV *25*, Γ_n=0.81 eV *8*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.0250 eV *24* (2008Ta04).
7247.685@ *8*	1/2@		XREF: Others: AG Γ_γ=0.094 eV *9*, Γ_n=1.50 eV *15*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.088 eV *8* (2008Ta04).
7247.982@ *1*	1/2@		XREF: Others: AG Γ_γ=0.190 eV *19*, Γ_n=0.48 eV *5*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.134 eV *10* (2008Ta04).
7248.656@ *1*	1/2@		XREF: Others: AG Γ_γ=0.240 eV *24*, Γ_n=0.098 eV *10*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.070 eV *5* (2008Ta04).
7248.847@ *1*	1/2@		XREF: Others: AG Γ_γ=0.250 eV *25*, Γ_n=0.22 eV *2*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.117 eV *8* (2008Ta04).
7250.09@ *2*	1/2@		XREF: Others: AG Γ_γ=0.190 eV *18*, Γ_n=64 eV *6*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.192 eV *18* (2008Ta04).
7250.80@ *1*	1/2@		XREF: Others: AG Γ_γ=0.250 eV *22*, Γ_n=41 eV *4*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.244 eV *21* (2008Ta04).
7252.055@ *4*	1/2@		XREF: Others: AG Γ_γ/Γ=0.42 eV *4*, Γ_n=0.65 eV *6*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.257 eV *18* (2008Ta04).
7252.570@ *8*	1/2@		XREF: Others: AG Γ_γ/Γ=0.180 eV *16*, Γ_n=9.4 eV *9*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.174 eV *15* (2008Ta04).
7256.1198@ *2*	3/2@		XREF: Others: AG Γ_γ=0.200 eV *20*, gΓ_n=0.70 eV *7*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.313 eV *25* (2008Ta04).
7256.624@ *2*	1/2@		XREF: Others: AG Γ_γ=0.150 eV *15*, Γ_n=1.0 eV *1*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.128 eV *11* (2008Ta04).
7258.1392@ *3*	1/2@		XREF: Others: AG Γ_γ=0.160 eV *16*, Γ_n=0.70 eV *7*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.133 eV *11* (2008Ta04).
7259.14@ *6*	1/2@		XREF: Others: AG Γ_γ=0.079 eV *8*, Γ_n=127 eV *13*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.079 eV *8* (2008Ta04).
7259.36@ *2*	3/2@		XREF: Others: AG Γ_γ=0.47 eV *4*, gΓ_n=129 eV *13*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.94 eV *7* (2008Ta04).
7259.544@ *2*	1/2@		XREF: Others: AG Γ_γ=0.30 eV *3*, Γ_n=0.70 eV *7*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.212 eV *16* (2008Ta04).
7262.737@ *7*	3/2@		XREF: Others: AG Γ_γ=0.43 eV *4*, gΓ_n=5.5 eV *5*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.80 eV *7* (2008Ta04).
7264.96@ *8*	1/2@		XREF: Others: AG Γ_γ=0.139 eV *20*, Γ_n=205 eV *25*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.139 eV.
7266.57@ *5*	3/2@		XREF: Others: AG Γ_γ=0.121 eV *15*, gΓ_n=300 eV *20*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.241 eV.
7267.42@ *5*	1/2@		XREF: Others: AG

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	XREF	Comments
			Γ_γ=0.135 eV *20*, Γ_n=170 eV *20*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.134 eV.
7268.57@ *5*	3/2@		XREF: Others: AG Γ_γ=0.105 eV *11*, gΓ_n=42 eV *8*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.209 eV.
7269.59@ *5*	@		XREF: Others: AG gΓ_n=2 eV *1*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.086 eV.
7270.06@ *5*	@		XREF: Others: AG gΓ_n=1.5 eV *10*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.175 eV.
7273.70@ *5*	@		XREF: Others: AG gΓ_n=0.5 eV *5*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.1 eV.
7274.18@ *5*	@		XREF: Others: AG gΓ_n=0.5 eV *5*.
7274.46@ *8*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.251 eV.
7275.48@ *8*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.36 eV.
7276.16@ *5*	3/2@		XREF: Others: AG Γ_γ=0.28 eV *4*, gΓ_n=210 eV *10*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.557 eV.
7277.22@ *5*	[1/2]@		XREF: Others: AG Γ_γ=0.102 eV *11*, gΓ_n=14 eV *3*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.102 eV.
7279.69@ *5*	1/2@		XREF: Others: AG Γ_γ=0.127 eV *22*, Γ_n=6.5 eV *10*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.125 eV.
7284.28@ *5*	1/2@		XREF: Others: AG Γ_γ=0.249 eV *25*, Γ_n=19 eV *3*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.246 eV.
7286.77@ *5*	3/2@		XREF: Others: AG Γ_γ=0.19 eV *4*, gΓ_n=4.00 eV *14*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.345 eV.
7288.16@ *5*	(1/2)@		XREF: Others: AG Γ_γ=0.31 eV *3*, gΓ_n=2 eV *1*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.272 eV.
7288.68@ *5*	@		XREF: Others: AG gΓ_n=4 eV *1*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.418 eV.
7289.63@ *5*	3/2@		XREF: Others: AG Γ_γ=0.21 eV *4*, gΓ_n=30 eV *4*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.408 eV.
7291.17@ *95*	3/2@		XREF: Others: AG Γ_γ=0.38 eV *5*, gΓ_n=42 eV *4*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.745 eV.
7292.99@ *5*	3/2@		XREF: Others: AG Γ_γ=0.46 eV *5*, gΓ_n=7 eV *2*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.82 eV.
7294.20@ *10*	3/2@		XREF: Others: AG Γ_γ=0.36 eV *3*, gΓ_n=2 eV *1*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.533 eV.
7298.45@ *10*	1/2@		XREF: Others: AG Γ_γ=1.38 eV *20*, Γ_n=210 eV *15*, $\Gamma_n\Gamma_\gamma/\Gamma$=1.373 eV.
7298.94@ *10*	3/2@		XREF: Others: AG Γ_γ=0.63 eV *10*, gΓ_n=300 eV *30*, g$\Gamma_n\Gamma_\gamma/\Gamma$=1.26 eV.
7302.01@ *20*	@		XREF: Others: AG gΓ_n<0.5 eV. g$\Gamma_n\Gamma_\gamma/\Gamma$=0.372 eV.
7302.90@ *10*	3/2@		XREF: Others: AG Γ_γ=0.41 eV *6*, gΓ_n=116 eV *14*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.806 eV.
7303.89@ *10*	3/2@		XREF: Others: AG Γ_γ=0.53 eV *6*, gΓ_n=150 eV *15*, g$\Gamma_n\Gamma_\gamma/\Gamma$=1.049 eV.
7305.08@ *10*	3/2@		XREF: Others: AG Γ_γ=0.40 eV *6*, gΓ_n=238 eV *20*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.806 eV.
7307.75@ *10*	1/2@		XREF: Others: AG gΓ_n=136 eV *12*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.577 eV.

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	XREF	Comments
7312.39@ *10*	1/2@		XREF: Others: AG Γ_γ=0.206 eV *21*, gΓ_n=142 eV *14*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.206 eV.
7315.06@ *10*	(3/2)@		XREF: Others: AG Γ_γ=0.272 eV *24*, gΓ_n=3 eV *1*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.461 eV.
7315.76@ *10*	[3/2]@		XREF: Others: AG Γ_γ=0.225 eV *25*, gΓ_n=23 eV *3*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.442 eV.
7316.15@ *10*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.605 eV.
7317.74@ *10*	1/2@		XREF: Others: AG Γ_γ=0.50 eV *8*, Γ_n=26 eV *3*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.49 eV.
7320.21@ *10*	@		XREF: Others: AG gΓ_n=34 eV *5*.
7320.70@ *10*	3/2@		XREF: Others: AG Γ_γ=0.65 eV *20*, gΓ_n=426 eV *30*, g$\Gamma_n\Gamma_\gamma/\Gamma$=1.3 eV.
7323.08@ *10*	1/2@		XREF: Others: AG Γ_γ=0.25 eV *9*, Γ_n=140 eV *10*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.252 eV.
7323.77@ *10*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.312 eV.
7324.36@ *10*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.486 eV.
7325.05@ *10*	3/2@		XREF: Others: AG Γ_γ=0.32 eV *5*, gΓ_n=342 eV *16*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.641 eV.
7327.13@ *10*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.448 eV.
7327.53@ *10*	3/2@		XREF: Others: AG Γ_γ=0.35 eV *8*, gΓ_n=334 eV *14*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.7 eV.
7332.47@ *10*	3/2@		XREF: Others: AG Γ_γ=0.30 eV *8*, gΓ_n=14 eV *2*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.57 eV.
7337.61@ *10*	1/2@		XREF: Others: AG Γ_n=325 eV *15*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.57 eV.
7338.70@ *10*	@		XREF: Others: AG gΓ_n=29 eV *3*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.473 eV.
7341.57@ *10*	@		XREF: Others: AG gΓ_n=3 eV *2*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.464 eV.
7343.55@ *10*	1/2@		XREF: Others: AG Γ_γ=0.47 eV *5*, Γ_n=190 eV *15*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.464 eV.
7344.44@ *10*	1/2@		XREF: Others: AG Γ_n=225 eV *25*.
7348.8@ *5*	1/2@		XREF: Others: AG Γ_γ=0.70 eV *15*, gΓ_n=1900 eV *250*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.697 eV.
7349.8@ *5*	3/2@		XREF: Others: AG Γ_γ=0.64 eV *10*, gΓ_n=720 eV *60*, g$\Gamma_n\Gamma_\gamma/\Gamma$=1.271 eV.
7352.85@ *10*	1/2@		XREF: Others: AG gΓ_n=49 eV *6*.
7353.14@ *10*	@		XREF: Others: AG gΓ_n=10 eV *5*. g$\Gamma_n\Gamma_\gamma/\Gamma$=0.895 eV.
7354.23@ *10*	[3/2]@		XREF: Others: AG Γ_γ=0.36 eV *4*, gΓ_n=42 eV *5*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.716 eV.
7356.41@ *10*	1/2@		XREF: Others: AG Γ_γ=0.83 eV *16*, gΓ_n=1090 eV *200*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.83 eV.

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	XREF	Comments
7357.39@ *10*	1/2@		XREF: Others: AG Γ_n=350 eV *50*.
7359.37@ *10*	3/2@		XREF: Others: AG Γ_γ=1.40 eV *2*, gΓ_n=860 eV *60*, g$\Gamma_n\Gamma_\gamma/\Gamma$=2.799 eV.
7361.85@ *10*	1/2@		XREF: Others: AG Γ_n=130 eV *20*.
7365.41@ *10*	3/2@		XREF: Others: AG Γ_γ=1.33 eV *20*, gΓ_n=600 eV *50*, g$\Gamma_n\Gamma_\gamma/\Gamma$=2.648 eV.
7367.5 *11*			XREF: Others: AF
7369.06@ *10*	1/2@		XREF: Others: AG Γ_n=170 eV *20*.
7370.55@ *10*	3/2@		XREF: Others: AG Γ_γ=0.46 eV *9*, gΓ_n=1750 eV *300*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.911 eV.
7372.72@ *10*	[1/2]@		XREF: Others: AG Γ_n=90 eV *9*.
7374.41@ *10*	3/2@		XREF: Others: AG Γ_γ=0.33 eV *6*, gΓ_n=544 eV *40*, g$\Gamma_n\Gamma_\gamma/\Gamma$=0.663 eV.
7377.17@ *10*	3/2@		XREF: Others: AG Γ_γ=0.55 eV *16*, gΓ_n=820 eV *60*, g$\Gamma_n\Gamma_\gamma/\Gamma$=1.098 eV.
7378.86@ *10*	1/2@		XREF: Others: AG Γ_n=50 eV *7*.
7381.23@ *20*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.406 eV.
7381.92@ *20*	@		XREF: Others: AG g$\Gamma_n\Gamma_\gamma/\Gamma$=0.499 eV.
7382.71@ *10*	1/2@		XREF: Others: AG Γ_γ=0.76 eV *25*, Γ_n=78 eV *8*, $\Gamma_n\Gamma_\gamma/\Gamma$=0.756 eV.
7385.58@ *10*	1/2@		XREF: Others: AG Γ_n=92 eV *10*.
7386.17@ *10*	1/2@		XREF: Others: AG Γ_n=106 eV *10*.
7391.12@ *10*	1/2@		XREF: Others: AG Γ_n=470 eV *30*.
7392.70@ *10*	@		XREF: Others: AG gΓ_n=30 eV *10*.
7394.48@ *10*	@		XREF: Others: AG gΓ_n=10 eV *5*.
7396.66@ *10*	@		XREF: Others: AG gΓ_n=50 eV *10*.
7399.43@ *10*	@		XREF: Others: AG gΓ_n=67 eV *10*.
7400.42@ *10*	@		XREF: Others: AG gΓ_n=24 eV *10*.
7400.71@ *10*	1/2@		XREF: Others: AG Γ_n=96 eV *10*.
7403.68@ *20*	3/2@		XREF: Others: AG gΓ_n=1300 eV *200*.
7407.54@ *20*	3/2@		XREF: Others: AG gΓ_n=750 eV *140*.
7411.7@ *3*	1/2@		XREF: Others: AG Γ_n=2400 eV *300*.

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)†	Jπ‡	XREF	Comments
7412.8@ *3*	3/2@		XREF: Others: AG gΓn=1510 eV *150*.
7415.3@ *3*	1/2@		XREF: Others: AG Γn=345 eV *35*.
7416.0@ *3*	[3/2]@		XREF: Others: AG gΓn=320 eV *40*.
7419.70@ *20*	3/2@		XREF: Others: AG gΓn=466 eV *50*.
7423.56@ *20*	1/2@		XREF: Others: AG Γn=413 eV *45*.
7430.4@ *5*	3/2@		XREF: Others: AG gΓn=3000 eV *300*.
7432.3@ *5*	1/2@		XREF: Others: AG Γn=3250 eV *300*.
7436.61@ *20*	@		XREF: Others: AG gΓn=42 eV *6*.
7438.89@ *20*	@		XREF: Others: AG gΓn=164 eV *20*.
7440.67@ *20*	1/2@		XREF: Others: AG Γn=96 eV *10*.
7445.91@ *20*	3/2@		XREF: Others: AG gΓn=580 eV *50*.
7448.09@ *20*	1/2@		XREF: Others: AG Γn=300 eV *30*.
7456.00@ *20*	1/2@		XREF: Others: AG Γn=200 eV *20*.
7456.89@ *20*	1/2@		XREF: Others: AG Γn=170 eV *25*.
7464.2@ *3*	3/2@		XREF: Others: AG gΓn=1100 eV *100*.
7464.6@ *3*	1/2@		XREF: Others: AG Γn=290 eV *30*.
7472.5@ *3*	[3/2]@		XREF: Others: AG gΓn=2190 eV *300*.
7475.9@ *3*	@		XREF: Others: AG gΓn=360 eV *50*.
7478.8@ *3*	3/2@		XREF: Others: AG gΓn=2140 eV *200*.
7481.1@ *3*	3/2@		XREF: Others: AG gΓn=480 eV *80*.
7482.6@ *3*	@		XREF: Others: AG gΓn=420 eV *50*.
7485.4@ *3*	3/2@		XREF: Others: AG gΓn=492 eV *60*.
7492.5@ *3*	1/2@		XREF: Others: AG Γn=410 eV *50*.
7645.3 *10*			XREF: Others: AF
7665.5 *10*			XREF: Others: AF
8359.3 *11*			XREF: Others: AF
8471.3 *11*			XREF: Others: AF
8627.8 *12*			XREF: Others: AF

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Adopted Levels, Gammas (continued)

^{91}Zr Levels (continued)

E(level)[†]	XREF	Comments
8889.2 *11*		XREF: Others: AF
9132.3 *12*		XREF: Others: AF
9188.3 *14*		XREF: Others: AF
9465.2 *15*		XREF: Others: AF
9596.2 *15*		XREF: Others: AF
10068.3 *14*		XREF: Others: AF
10442.3 *14*		XREF: Others: AF
10531.2 *18*		XREF: Others: AF
10659.2 *18*		XREF: Others: AF
11063.2 *21*		XREF: Others: AF
11165.3 *20*		XREF: Others: AF
11639.3? *22*		XREF: Others: AF
12136.4? *22*		XREF: Others: AF
12773.4 *23*		XREF: Others: AF
14.40×10^3 *15*	U	Not a discrete state; Γ=6 MeV.

[†] Level energies with ΔE≤3 keV are calculated from the Adopted Gammas by means of a least-squares fit. The others are weighted averages from reaction data (see XREF column).

[‡] Target spins for (d,p), (p,d), and (d,t) reactions are 0^+.

[#] From $\gamma(\theta)$ observed in (^{6}Li,2npγ) (1976Br14), together with the arguments given under comments.

[@] All data are from (n,γ) E=res. note that the systematic uncertainty of 0.4 keV arising from the adopted S(n) value needs to be combined In quadrature with the uncertainties shown here for E(level).

Adopted Levels, Gammas (continued)

γ(^{91}Zr)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ	α[j]	Comments
1204.81	1/2$^+$	1204.80 *13*	100	0.0	5/2$^+$	E2			B(E2)(W.u.)=15 *4* E_γ: unweighted average of 1204.67 *8* from ε decay (60.86 d) and 1204.92 *10* from (n,n′γ). Mult.: from Coulomb excitation.
1466.4	5/2$^+$	1466.3[b] *4*	100	0.0	5/2$^+$	[M1,E2]			B(M1)(W.u.)=0.0218 *21* if pure M1; B(E2)(W.u.)=10.7 *10* if pure E2.
1882.20	7/2$^+$	1882.18[e] *19*	100	0.0	5/2$^+$	(M1+E2)	+1.25 *15*		B(M1)(W.u.)=0.017 *4*; B(E2)(W.u.)=7.7 *13* δ: 0.4 *1* or 1.25 *15* from γ(θ) in (γ,γ′), +1.0 *+27−4* from γ(θ) in (n,n′γ).
2042.35	3/2$^+$	2042.33[b] *19*	100	0.0	5/2$^+$	(M1(+E2))			B(M1)(W.u.)=0.233 *23* if pure M1; B(E2)(W.u.)=59 *6* if pure E2. δ: −10<δ<+0.1 from γ(θ) in (n,n′γ).
2131.49	(9/2)$^+$	2131.54[a] *18*	100	0.0	5/2$^+$	(E2)			B(E2)(W.u.)=4.2 *6* Mult.: stretched (Q) from γ(θ) in (n,n′γ), not M2 from RUL.
2170.15	(11/2)$^-$	38.7[g] *2*	2.5[g] *14*	2131.49	(9/2)$^+$	[E1]		1.75 *4*	B(E1)(W.u.)<0.025
		2170.04[&] *18*	100 *10*	0.0	5/2$^+$	(E3)			Additional information 1. I_γ: from (^{6}Li,2npγ). Mult.: γ(θ) in (^{6}Li,2npγ) and (n,n′γ) consistent with octupole; Δπ from level scheme.
2189.5	(5/2)$^-$	2189.0[h] *7*	100	0.0	5/2$^+$	[E1]			B(E1)(W.u.)>1.8×10^{-5}
2200.5	7/2$^+$	2200.5 *3*	100	0.0	5/2$^+$	(M1+E2)			δ: −0.20 *+25−80* or −2.3 *+13−37* from (n,n′γ). B(M1)(W.u.)=0.0060 *+11−17*, B(E2)(W.u.)=0.053 *+10−15* if δ=−0.20; B(M1)(W.u.)=0.00100 *+19−28*, B(E2)(W.u.)=1.15 *+21−32* if δ=−2.3.
2259.92	(13/2)$^-$	89.55[f] *19*	100	2170.15	(11/2)$^-$				Mult.: not stretched Q (from γ(θ) in (α,nγ)).
2287.8	(15/2)$^-$	28.0[g] *2*	100[g]	2259.92	(13/2)$^-$	(M1)		7.92 *21*	B(M1)(W.u.)=0.00388 *17* Mult.: from α(exp) in (^{6}Li,2npγ).
2320.5	(11/2)$^-$	60.33[f] *20*		2259.92	(13/2)$^-$				
		151.1[d] *4*		2170.15	(11/2)$^-$				
2356.4	(1/2)$^-$	1151.6[h] *6*	100	1204.81	1/2$^+$				
2366.56		2366.53[e] *19*	100	0.0	5/2$^+$				
2394.9	(9/2)$^-$	224.8 *7*	100	2170.15	(11/2)$^-$				E_γ: from (α,nγ).
2534.69	(3/2$^+$,5/2$^+$)	652.49[h] *20*	77 *20*	1882.20	7/2$^+$				
		1068.0 *5*	48 *9*	1466.4	5/2$^+$				
		2534.8 *4*	100 *18*	0.0	5/2$^+$				
2557.8	1/2$^+$	2557.8[c] *5*	100	0.0	5/2$^+$	[E2]			B(E2)(W.u.)=1.6 *+5−8*
2577.9	(3/2)$^-$	2577.9[e] *5*	100	0.0	5/2$^+$	[E1]			B(E1)(W.u.)=0.00023 *6*
2640.2	(3/2)$^-$	2640.1[h] *4*	100	0.0	5/2$^+$	[E1]			B(E1)(W.u.)=0.00023 *12*
2693.7	(3/2)$^-$	2693.7[e] *4*	100	0.0	5/2$^+$	(E1(+M2))	−0.3 *+3−7*		B(E1)(W.u.)=0.00068 *11*

Adopted Levels, Gammas (continued)

γ(^{91}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[j]	Comments
								B(E1)(W.u.): If pure E1. δ: from γ(θ) in (n,n′γ).
2764.6	(13/2,15/2)$^-$	443.8[h] *5*	29	2320.5	(11/2)$^-$			I_γ: average of 33 and 25 from (α,nγ) at E(p)=11.8 and 13.5 MeV, respectively.
		477.2[f] *6*	100	2287.8	(15/2)$^-$			Mult.: not stretched Q (from γ(θ) in (^{6}Li,2npγ)).
2775.2	(5/2)$^-$	732.4[k] *5*	86 *25*	2042.35	3/2$^+$			
		2775.2 *5*	100 *25*	0.0	5/2$^+$	[E1]		B(E1)(W.u.)=6.E−5 *+3−4*
2791.46	(≥5/2)	659.97[h] *20*	100	2131.49	(9/2)$^+$			
2810.9	(7/2$^+$)	415.9[k] *7*	36	2394.9	(9/2)$^-$	[E1]		B(E1)(W.u.)=0.045 *+10−12* Reported in (α,nγ) only. Iγ is average of 33 and 40 from (α,nγ) at E(p)=11.8 and 13.5 MeV, respectively. Mult.: not pure E2 from RUL.
		770.5 *10*	19 *7*	2042.35	3/2$^+$	[E2]		B(E2)(W.u.)=440 *+190−200*
		2810.9[e] *7*	100 *21*	0.0	5/2$^+$	[M1]		B(M1)(W.u.)=0.027 *+8−9*
2826.0	3/2$^+$,5/2$^+$	2826.0 *16*	100	0.0	5/2$^+$			E_γ: from (α,nγ).
2835.7	(3/2,5/2,7/2)$^-$	1369.2[k] *3*	100	1466.4	5/2$^+$			
2857.06	(13/2)$^+$	537[g] *1*	27[g] *3*	2320.5	(11/2)$^-$			
		570[g] *1*	20.3[g] *20*	2287.8	(15/2)$^-$			
		596.9[g] *3*	61[g] *6*	2259.92	(13/2)$^-$			
		725.7[g] *3*	100[g] *9*	2131.49	(9/2)$^+$	E2		B(E2)(W.u.)>0.0079 Mult.: Q from γ(θ) in (^{6}Li,2npγ), not M2 from RUL. In (n,n′γ), this γ was tentatively placed from a 2896 level which is not adopted here.
2871.5	3/2$^+$	2871.0 *8*	100	0.0	5/2$^+$			
2902.3	(7/2)$^+$	712.6 *5*	100 *30*	2189.5	(5/2)$^-$			
		2903.1 *10*	80 *30*	0.0	5/2$^+$			
2914.2	(9/2$^+$)	782.7 *4*	100	2131.49	(9/2)$^+$			
2928.4	3/2$^+$,5/2$^+$	2928.3 *10*	100	0.0	5/2$^+$			
2992.1		791.6 *6*	100	2200.5	7/2$^+$			
3007.7	5/2$^-$,7/2$^-$	3007.6 *8*	100	0.0	5/2$^+$	[E1]		B(E1)(W.u.)=0.00013 *+4−6*
3017.1		3017.0 *20*	100	0.0	5/2$^+$			E_γ: from (α,nγ).
3083.3	3/2$^+$	3083.3[h] *7*	100	0.0	5/2$^+$			
3107.9	7/2$^+$,9/2$^+$	3107.8 *8*	100	0.0	5/2$^+$			
3146.9	(17/2)$^+$	289.8[g] *3*	13.3[g] *13*	2857.06	(13/2)$^+$	E2	0.0244	B(E2)(W.u.)>0.19 Mult.: Q from γ(θ) in (^{6}Li,2npγ), not M2 from RUL.
		859.0[g] *3*	100[g] *10*	2287.8	(15/2)$^-$			Mult.: not stretched Q from γ(θ) in (^{6}Li,2npγ).
3167.3	(21/2$^+$)	(20.4[g] *2*)	7.0[g] *7*	3146.9	(17/2)$^+$	[E2]	341 *14*	B(E2)(W.u.)=4.3 *7* E_γ,I_γ: from (^{6}Li,2npγ); see comments in that data set.
		879.4[g] *3*	100[g] *11*	2287.8	(15/2)$^-$	[E3]	0.00202	B(E3)(W.u.)=0.056 *9*
3234.8	(3/2)$^-$	3234.7 *10*	100	0.0	5/2$^+$	[E1]		B(E1)(W.u.)=0.00037 *+7−9*
3276.6	(3/2$^-$)	1810.1[k] *4*	100	1466.4	5/2$^+$			

$^{91}_{40}Zr_{51}$-17

Adopted Levels, Gammas (continued)

γ(^{91}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
3290.4	3/2$^+$	1248.0[k] *4*	100	2042.35	3/2$^+$		
3331.1	1/2$^+$	3331.0 *15*	100	0.0	5/2$^+$		
3476.1	1/2$^-$,3/2$^-$	3476[k] *1*	100	0.0	5/2$^+$		E_γ: from (γ,γ'); 3476.7 In (n,γ). Deexcites this level and/or the 3/2$^+$,5/2$^+$ 3477 level.
3476.3	3/2$^+$,5/2$^+$	3476[k] *1*	100	0.0	5/2$^+$		E_γ: from (γ,γ'); 3476.7 In (n,γ). Deexcites this level and/or the 1/2$^-$,3/2$^-$ 3476 level.
3576.1	(3/2)$^-$	3576 *1*	100	0.0	5/2$^+$	[E1]	B(E1)(W.u.)=0.00096 *17* E_γ: from (γ,γ').
3681	3/2$^+$	3681 *3*	100	0.0	5/2$^+$		B(M1)(W.u.)=0.07 *3* if pure M1; B(E2)(W.u.)=5.2 *21* if pure E2 transition. E_γ: from (γ,γ').
3704	7/2$^+$,9/2$^+$	3704 *3*	100	0.0	5/2$^+$		E_γ: from (γ,γ').
3984.2	3/2$^+$,5/2$^+$	3984.5	100	0.0	5/2$^+$		E_γ: from (n,γ).
4162.4	3/2$^+$,5/2$^+$	4162.6	100	0.0	5/2$^+$		E_γ: from (n,γ).
4180.0	1/2$^{(+)}$,3/2,5/2$^+$	2713.6	100	1466.4	5/2$^+$		E_γ,I_γ: from (n,γ).
		4180.2	15	0.0	5/2$^+$		E_γ,I_γ: from (n,γ).
4319.8	3/2$^-$	4319.8	100	0.0	5/2$^+$	[E1]	B(E1)(W.u.)=0.0010 *5* E_γ: from (n,γ) E=thermal; Eγ=4322 *2* In (γ,γ').
4685	(1/2$^+$,3/2$^-$)	4685 *5*		0.0	5/2$^+$		E_γ: from level energy difference. Possibly the 4674γ from (γ,γ').
4704?		4704.1[k] *10*	100	0.0	5/2$^+$		E_γ: from (γ,γ') alone so shown As tentative.
4712.1		1545[i]	100	3167.3	(21/2$^+$)		
5308.2		596[i]		4712.1			
		2141[i]		3167.3	(21/2$^+$)		
5495.6		2328[i]	100	3167.3	(21/2$^+$)		
5613.1		305[i]		5308.2			
		901[i]		4712.1			
5741.3		128[i]		5613.1			
		2574[i]		3167.3	(21/2$^+$)		
6773.2		1032[i]		5741.3			
		1160[i]		5613.1			
7014.3		241[i]		6773.2			
		1273[i]		5741.3			
		1401[i]		5613.1			
7194.4	1/2$^+$	2662.12[@k]	23[@]	4532.7	3/2$^+$,5/2$^+$		
		2875.00[@]	35[@]	4319.8	3/2$^-$	[E1]	
		3015.12[@]	100[@]	4180.0	1/2$^{(+)}$,3/2,5/2$^+$		
		3032.53[@]	28[@]	4162.4	3/2$^+$,5/2$^+$		
		3169.20[@k]	10[@]	4025.6	(3/2$^+$,5/2$^+$)		
		3210.85[@]	35[@]	3984.2	3/2$^+$,5/2$^+$		
		3718.15[@]	49[@]	3476.1	1/2$^-$,3/2$^-$		

$^{91}_{40}Zr_{51}$-18

Adopted Levels, Gammas (continued)

γ(^{91}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]
7194.4	1/2$^+$	3906.30[@ k]	10[@]	3290.4	3/2$^+$	
		3960.14[@ k]	28[@]	3234.8	(3/2)$^-$	[E1]
		4111.5[@]	11[@]	3083.3	3/2$^+$	
		4322.4[@]	35[@]	2871.5	3/2$^+$	
		4553.9[@]	15[@]	2640.2	(3/2)$^-$	[E1]
		4617.0[@]	43[@]	2577.9	(3/2)$^-$	[E1]
		4636.8[@]	23[@]	2557.8	1/2$^+$	
		4828.5[@ k]	19[@]	2366.56		
		5152.4[@]	19[@]	2042.35	3/2$^+$	
		5989.8[@]	13[@]	1204.81	1/2$^+$	
		7194.4[@]	2.4[@]	0.0	5/2$^+$	[E2]
7213.8		1601[i]		5613.1		
		1718[i]		5495.6		
		2502[i]		4712.1		
7367.5		1626[i]	100	5741.3		
7645.3		872[i]		6773.2		
		1904[i]		5741.3		
7665.5		452[i]		7213.8		
		1924[i]		5741.3		
8359.3		694[i]	100	7665.5		
8471.3		1104[i]		7367.5		
8471.3		1457[i]		7014.3		
8627.8		1260[i]	100	7367.5		
8889.2		261[i]		8627.8		
		418[i]		8471.3		
		530[i]		8359.3		
		1244[i]		7645.3		
9132.3		773[i]		8359.3		
		1487[i]		7645.3		
9188.3		829[i]	100	8359.3		
9465.2		576[i]	100	8889.2		
9596.2		707[i]	100	8889.2		
10068.3		880[i]		9188.3		
		936[i]		9132.3		
10442.3		374[i]	100	10068.3		
10531.2		935[i]	100	9596.2		
10659.2		1194[i]	100	9465.2		
11063.2		404[i]	100	10659.2		
11165.3		723[i]	100	10442.3		
11639.3?		474[ik]	100	11165.3		
12136.4?		971[ik]	100	11165.3		
12773.4		1710[i]	100	11063.2		

[†] From (n,n′γ), except as noted.
[‡] γ branching ratios for each level; from (n,n′γ), except as noted.
[#] From γ(θ) observed in (n,n′γ), if not indicated otherwise.
[@] Primary γ from (n,γ) E=thermal.
[&] Weighted average from (α,nγ), (n,n′γ), (^{6}Li,2npγ), (^{13}C,^{12}Cγ).
[a] Weighted average from (α,nγ), (n,n′γ), (^{6}Li,2npγ), (γ,γ′).
[b] Weighted average from (α,nγ), (n,n′γ), (^{13}C,^{12}Cγ), (γ,γ′).
[c] Weighted average from (α,nγ), (n,n′γ), (^{13}C,^{12}Cγ).
[d] Weighted average from (α,nγ), (n,n′γ), and (^{6}Li,2npγ).
[e] Weighted average from (α,nγ), (n,n′γ), (γ,γ′).
[f] Weighted average from (α,nγ) and (^{6}Li,2npγ).
[g] From (^{6}Li,2npγ).
[h] Weighted average from (n,n′γ) and (α,nγ).

$^{91}_{40}Zr_{51}$-19

Adopted Levels, Gammas (continued)

$\gamma(^{91}Zr)$ (continued)

[i] From $^{82}Se(^{13}C,4n\gamma)$.
[j] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[k] Placement of transition in the level scheme is uncertain.

$^{91}_{40}Zr_{51}$-20

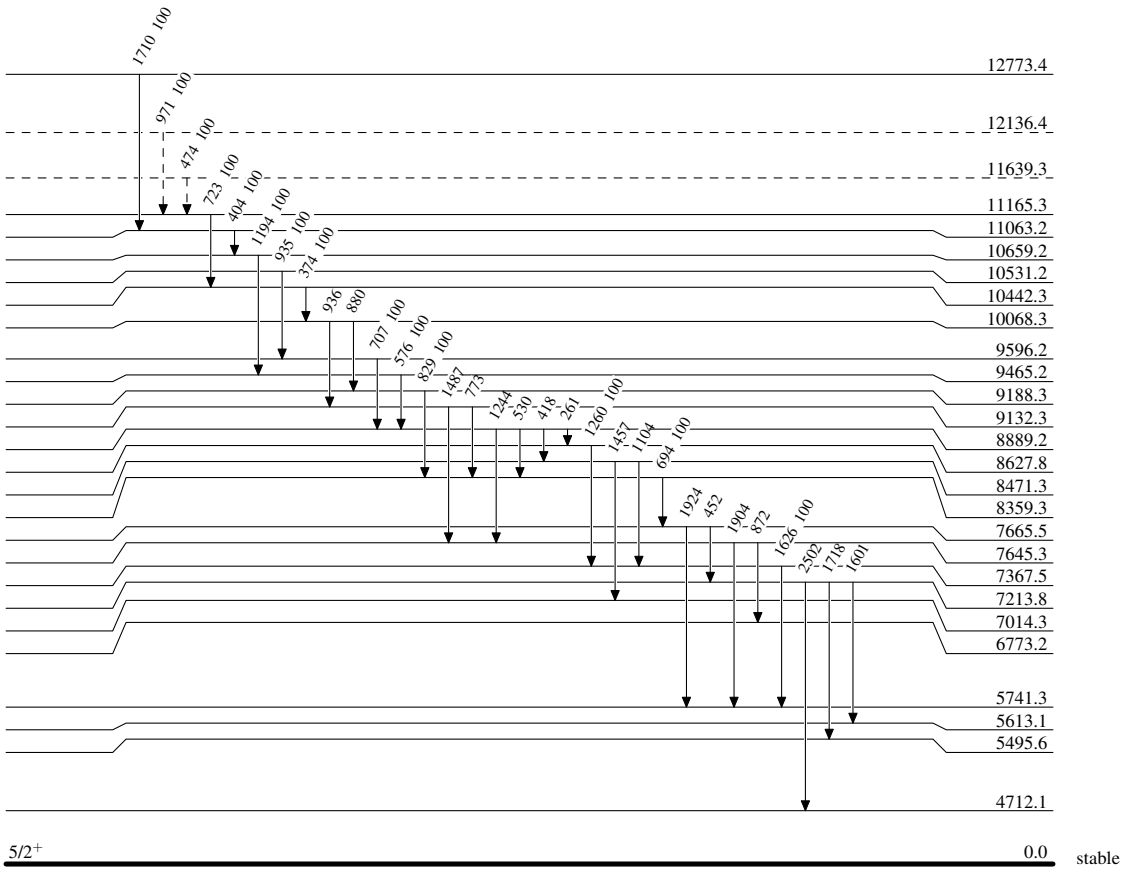
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{91}_{40}Zr_{51}$

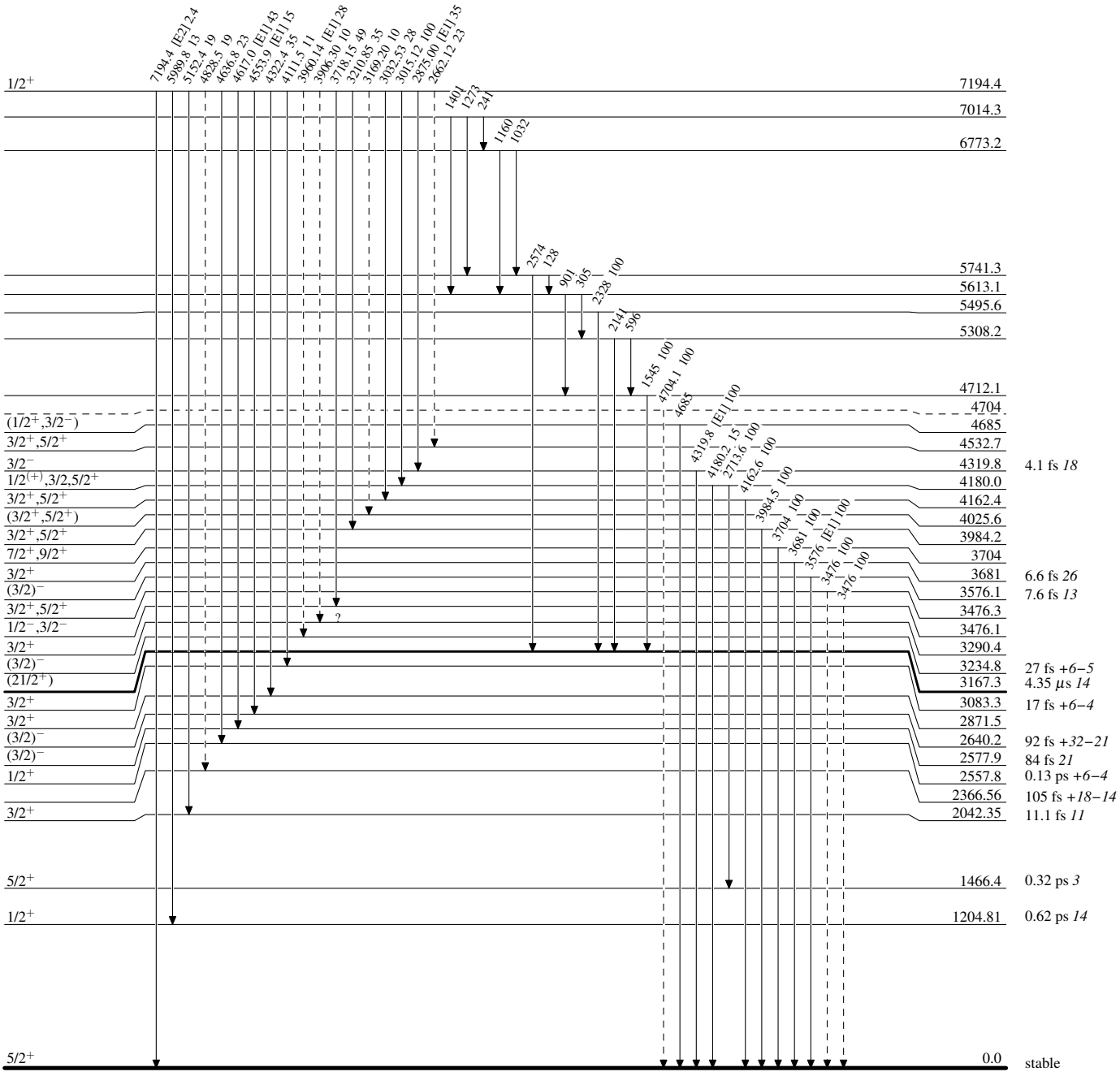
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{91}_{40}Zr_{51}$

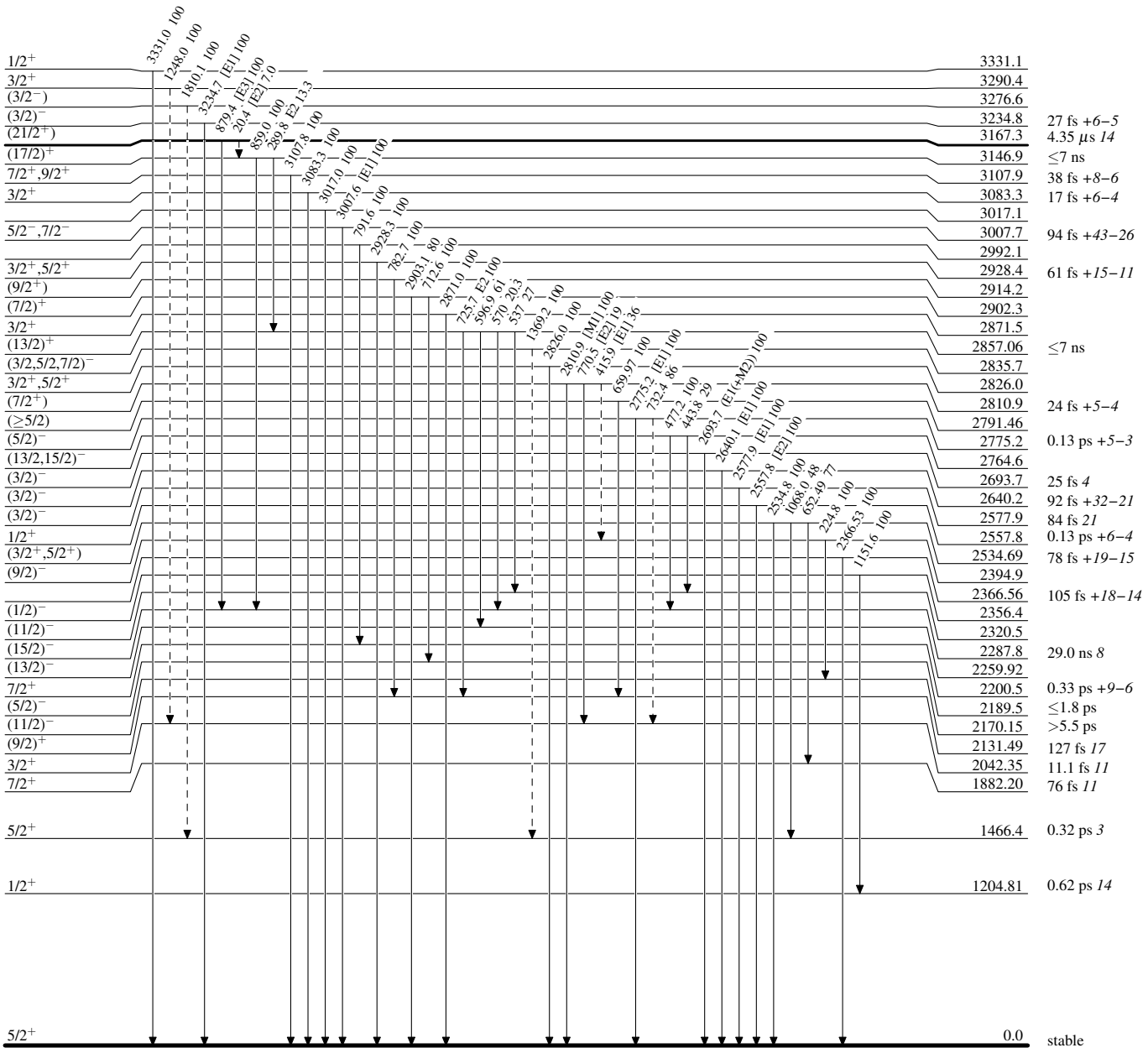
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

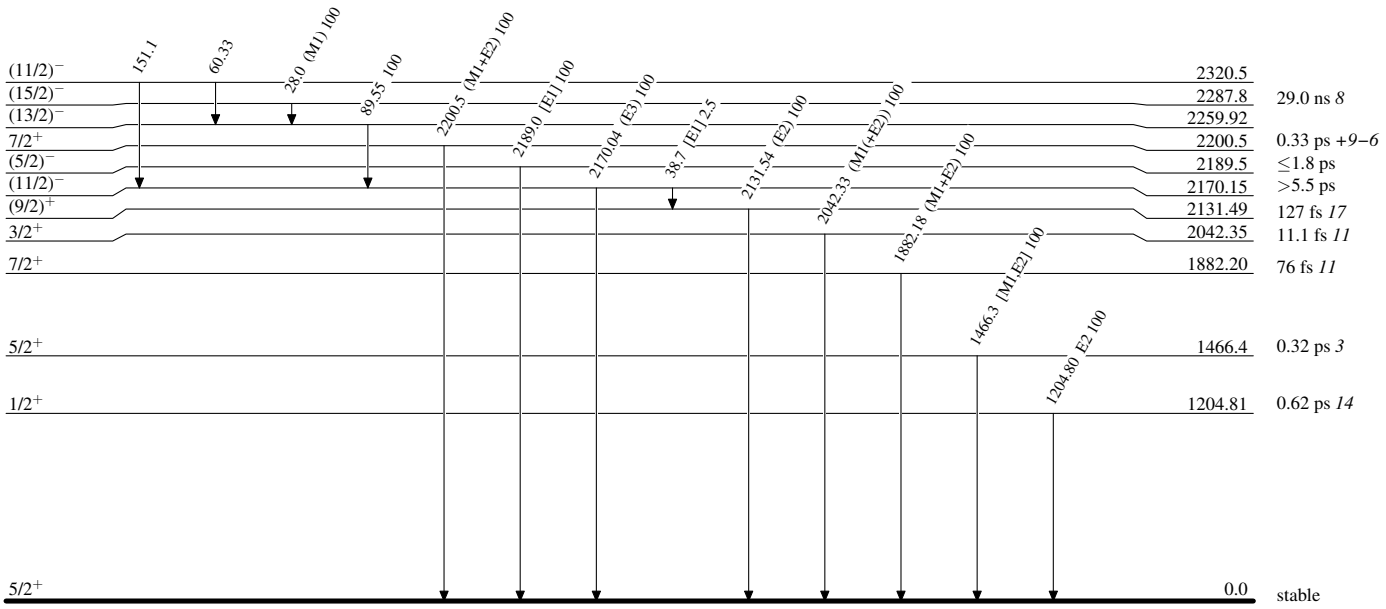


$^{91}_{40}Zr_{51}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{91}_{40}Zr_{51}$