Coulomb excitation 1979Mc04,1992La02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 134, 149 (2016)	15-Apr-2015

Others: 1957Ch39 (E(p)=3.7 MeV), 1958Mc02 (E(p)=4 MeV), 1961Ha21 ((p,p′) and (d,d′)), 1966Th07 (p, ^{6}Li, ^{7}Li; E=1.3-3.3 MeV), 1967As03 ((^{16}O,^{16}Oγ)), 1968St13 (Eα=8 MeV).

1979Mc04:

(α,α'): E(α)=13 MeV; carbon-backed, isotopically-separated ^{183}W target; Enge split-pole spectrometer with position-sensitive gas proportional counter (FWHM=11 keV); θ(lab)=90° and 150°;

Measured σ(150°); deduced B(E2).

(α,$\alpha'\gamma$): E(α)=15 MeV; thick, natural W target; Ge(Li) (θ(lab)=0°, 55°, 90°); measured Eγ, Iγ, $\gamma(\theta)$.

1992La02: (^{58}Ni,^{58}Ni′γ): E(^{58}Ni)=160,220 MeV; 77.4% ^{183}W target sputtered onto annealed Gd foil with Cu backing or onto Pb; 4 HPGe detectors, annular Si detector (θ(lab)=146° *1666*°); measured Eγ, Iγ, $\gamma\gamma$ coin, particle-γ coin, $\gamma(\theta$,H,T) (thin-foil transient field IMPAC technique; H=0.05 Tesla, T≈90° K), $\gamma(\theta)$, $T_{1/2}$ from Doppler-broadened lineshapes.

^{183}W Levels

E(level)	J$^{\pi}$ [†]	$T_{1/2}$ [‡]	Comments
0.0[&]	1/2⁻		
46.5[&]	3/2⁻	219 ps *10*	B(E2)↑=1.63 *4* (1979Mc04) B(E2)↑: from particle spectroscopy. Other values: 1.52 *7* (1961Ha21), 1.50 *+16−12* (1968St13); 1.37 *19* from B(E2)/(1+α)=0.148 *20* (1966Th07). other $T_{1/2}$:≈208 ps (1967As03; RDM).
99.1[&]	5/2⁻	716 ps *32*	B(E2)↑=2.21 *3* (1979Mc04) B(E2)↑: from particle spectroscopy. Other values: 2.7 *3* (1958Mc02), 2.04 *8* (1961Ha21), 2.31 *11* (1968St13). other $T_{1/2}$: 707 ps *35* (1967As03; RDM).
207.0[&]	7/2⁻		μ=0.42 *21* (1992La02) μ: g-factor=0.12 *6* (1992La02; thin-foil transient-field IMPAC).
208.8[a]	3/2⁻	≈245 ps	B(E2)↑=0.010 *5* (1979Mc04) B(E2)↑: weighted average of 0.015 *5* from (α,α') and 0.006 *4* from (α,$\alpha'\gamma$) (1979Mc04). Other values: 0.049 *6* (1958Mc02), 0.08 *2* (1961Ha21).
291.7[a]	5/2⁻	60 ps *3*	B(E2)↑=0.243 *9* (1979Mc04) B(E2)↑: weighted average of 0.239 *9* from (α,α') and 0.265 *22* from (α,$\alpha'\gamma$) (1979Mc04). Other values: 0.246 *22* (1958Mc02), 0.30 *5* (1961Ha21).
308.9[&]	9/2⁻		μ=1.53 *14* (1992La02) g-factor=0.34 *3* (1992La02; thin-foil transient-field IMPAC).
412.1[a]	7/2⁻		
475.4[#&] *3*	11/2⁻		μ=1.12 *22* (1992La02) μ: g-factor=0.20 *4* (1992La02; thin-foil transient-field IMPAC).
551.1[a]	9/2⁻		μ=2.2 *9* (1992La02) μ: g-factor=0.48 *19* (1992La02; thin-foil transient-field IMPAC).
631.2[#&] *3*	13/2⁻	10.4[@] ps *+28−14*	μ=2.6 *3* (1992La02) μ: g-factor=0.40 *5* (1992La02; thin-foil transient-field IMPAC). $T_{1/2}$: from 1992La02.
739.92[a] *23*	11/2⁻		
850.6[#&] *3*	15/2⁻		
903.5	(5/2⁻)		B(E2)↑=0.0064 *6* (1979Mc04)
926.25[#a] *25*	13/2⁻		
1026.3	(3/2)⁻		B(E2)↑=0.0010 *2* (1979Mc04)
1052.9	(5/2)⁻		B(E2)↑≤0.0019 (1979Mc04)
1062.5[#&] *4*	17/2⁻	3.0[@] ps *4*	μ=2.6 *7* (1992La02) μ: g-factor=0.30 *8* (1992La02; thin-foil transient-field IMPAC). $T_{1/2}$: from 1992La02.

Continued on next page (footnotes at end of table)

Coulomb excitation 1979Mc04,1992La02 (continued)

^{183}W Levels (continued)

E(level)	Jπ†	Comments
1149.8	3/2−	B(E2)↑=0.0009 *4* (1979Mc04)
1291.6	(1/2−,3/2−)	B(E2)↑=0.0044 *6* (1979Mc04)
1309.9	(≤5/2−)	B(E2)↑=0.0077 *6* (1979Mc04)
1332.4?& *5*	(19/2−)	
1463.1	(3/2,5/2)−	B(E2)↑=0.0034 *4* (1979Mc04)
1485.0	(1/2−,3/2−)	B(E2)↑=0.018 *2* (1979Mc04)
1510.4	(3/2−,5/2,7/2−)	B(E2)↑=0.0056 *7* (1979Mc04)
1556.4	(3/2−)	B(E2)↑=0.020 *2* (1979Mc04)

† From Adopted Levels.
‡ Calculated from measured B(E2) and adopted γ-ray properties, except As noted.
\# Level populated directly by Coulomb excitation, favoring π=−, As for g.s. (1992La02).
@ From Doppler-broadened lineshape (1992La02).
& Band(A): 1/2[510] band.
a Band(B): 3/2[512] band.

γ(^{183}W)

Eγ†	Iγ‡	Ei(level)	Jπi	Ef	Jπf	Mult.#	δ#	Comments
46.51 *3*		46.5	3/2−	0.0	1/2−			Eγ: from 1957Ch39 (curved crystal spectrometer; E relative to E(K x ray) for W. Mult.: E2 excitation of level (1966Th07) based on relative yields from ^{6}Li and ^{7}Li Coulomb excitation.
52.6@		99.1	5/2−	46.5	3/2−			
82.9@		291.7	5/2−	208.8	3/2−			
84.7@		291.7	5/2−	207.0	7/2−			
99.1@		99.1	5/2−	0.0	1/2−			
101.9@	7.3 *7*	308.9	9/2−	207.0	7/2−	D+Q	−0.21 *3*	Iγ: I(102γ)/I(210γ)=0.073 *7* (1992La02) implies I(102γ)=6.2.
107.9@		207.0	7/2−	99.1	5/2−	D+Q	−0.09 *2*	
109.7@		208.8	3/2−	99.1	5/2−			
120.4@		412.1	7/2−	291.7	5/2−			
139.2@		551.1	9/2−	412.1	7/2−			
155.8@		631.2	13/2−	475.4	11/2−			Iγ: I(156γ)/I(322γ)=0.012 *4* (1992La02).
160.5	164	207.0	7/2−	46.5	3/2−			W(0°)/W(90°)=1.15 *2* (1979Mc04). I(161γ)/I(108γ)=0.256 *11* (1992La02).
162.3	485	208.8	3/2−	46.5	3/2−			W(0°)/W(90°)=1.12 *1* (1979Mc04).
166.4@		475.4	11/2−	308.9	9/2−	D+Q	−0.12 *2*	Iγ: I(166γ)/I(269γ)=0.763 *15* (1992La02).
186.3		926.25	13/2−	739.92	11/2−			
188.6@&		739.92	11/2−	551.1	9/2−			
192.6	118	291.7	5/2−	99.1	5/2−			W(0°)/W(90°)=1.220 *18* (1979Mc04).
203.3@		412.1	7/2−	208.8	3/2−			
205.1@		412.1	7/2−	207.0	7/2−			
208.8	83	208.8	3/2−	0.0	1/2−			W(0°)/W(90°)=0.875 *16* (1979Mc04).
209.9	85	308.9	9/2−	99.1	5/2−			W(0°)/W(90°)=1.44 *3* (1979Mc04).
219.4@	27 *3*	850.6	15/2−	631.2	13/2−	D+Q	−0.25 *7*	

Continued on next page (footnotes at end of table)

Coulomb excitation 1979Mc04,1992La02 (continued)

$\gamma(^{183}W)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	Comments
245.2	124	291.7	5/2⁻	46.5	3/2⁻			W(0°)/W(90°)=0.982 *21* (1979Mc04).
259.4	8.3	551.1	9/2⁻	291.7	5/2⁻			
268.5		475.4	11/2⁻	207.0	7/2⁻			E_γ: from fig. 1 of 1992La02; 268.3 In table 1 of 1992La02.
291.7	1391	291.7	5/2⁻	0.0	1/2⁻			W(0°)/W(90°)=1.171 *12* (1979Mc04).
313.0[@]	14	412.1	7/2⁻	99.1	5/2⁻	D+Q	+0.23 *3*	
322.2[@]		631.2	13/2⁻	308.9	9/2⁻			
327.8[@]		739.92	11/2⁻	412.1	7/2⁻			
344.1	4.7	551.1	9/2⁻	207.0	7/2⁻	D+Q	+0.37 *10*	I_γ: I(344γ)/I(259γ)=0.49 *3* (1992La02) implies I(344γ)=4.1. δ: from table 6 of 1992La02; +0.37 *8* In table 2.
365.6[@]		412.1	7/2⁻	46.5	3/2⁻			
374.9[@]	100	926.25	13/2⁻	551.1	9/2⁻			
375.2[@]	100	850.6	15/2⁻	475.4	11/2⁻			
431.0[@]		739.92	11/2⁻	308.9	9/2⁻			I(431.0γ)/I(431.3γ)≈0.35 (1992La02).
431.3[@]		1062.5	17/2⁻	631.2	13/2⁻			
450.9[@]	22 *5*	926.25	13/2⁻	475.4	11/2⁻			I_γ: I(451γ)/I(375γ)=0.22 *5* (1992La02).
452.0	4.5	551.1	9/2⁻	99.1	5/2⁻			I_γ: I(452γ)/I(259γ)=0.68 *5* (1992La02) implies I(452γ)=5.6.
481.8[@&]		1332.4?	(19/2⁻)	850.6	15/2⁻			E_γ: tentative transition; placed on the basis of band systematics.
532.9[@]		739.92	11/2⁻	207.0	7/2⁻			
581.5	3.0	1485.0	(1/2⁻,3/2⁻)	903.5	(5/2⁻)			
617.3[@]	10 *2*	926.25	13/2⁻	308.9	9/2⁻			I_γ: I(617γ)/I(375γ)=0.10 *2* (1992La02).
640.8	≤1.0	1052.9	(5/2)⁻	412.1	7/2⁻			
652.9	21	1556.4	(3/2⁻)	903.5	(5/2⁻)			
804.4	8.0	903.5	(5/2⁻)	99.1	5/2⁻			
857.0	7.4	903.5	(5/2⁻)	46.5	3/2⁻			
942.8	0.8	1149.8	3/2⁻	207.0	7/2⁻			
979.8	1.5	1026.3	(3/2)⁻	46.5	3/2⁻			
1026.3	3.3	1026.3	(3/2)⁻	0.0	1/2⁻			
1051.0	5.9	1463.1	(3/2,5/2)⁻	412.1	7/2⁻			
1098.3	6.5	1510.4	(3/2⁻,5/2,7/2⁻)	412.1	7/2⁻			
1144.3	2.0	1556.4	(3/2⁻)	412.1	7/2⁻			
1149.8	3.0	1149.8	3/2⁻	0.0	1/2⁻			
1192.5	5.9	1291.6	(1/2⁻,3/2⁻)	99.1	5/2⁻			
1263.4	3.3	1309.9	(≤5/2⁻)	46.5	3/2⁻			
1291.6	5.1	1291.6	(1/2⁻,3/2⁻)	0.0	1/2⁻			
1301.6	2.2	1510.4	(3/2⁻,5/2,7/2⁻)	208.8	3/2⁻			
1309.9	17	1309.9	(≤5/2⁻)	0.0	1/2⁻			
1347.6	4.2	1556.4	(3/2⁻)	208.8	3/2⁻			
1438.5	13	1485.0	(1/2⁻,3/2⁻)	46.5	3/2⁻			
1485.0	14	1485.0	(1/2⁻,3/2⁻)	0.0	1/2⁻			

[†] From 1979Mc04, except As noted; uncertainty unstated by authors.
[‡] Thick-target yield per nanocoulomb (6.24×10^9 ions) In (α,α′) (1979Mc04). photon branching determined by 1992La02 from angular correlation data is given In comments.
[#] From particle-γ angular correlation, using alignment tensors calculated with Winther-deBoer Coulomb excitation code (1992La02). the latter code had been demonstrated to give good agreement with experiment for several known pure E2-transition

Continued on next page (footnotes at end of table)

Coulomb excitation 1979Mc04,1992La02 (continued)

$\gamma(^{183}W)$ (continued)

particle-γ correlations.

[@] From fig. 1 of 1992La02 only; uncertainty unstated by authors.

[&] Placement of transition in the level scheme is uncertain.

Coulomb excitation 1979Mc04,1992La02

Level Scheme

Intensities: Relative I_γ

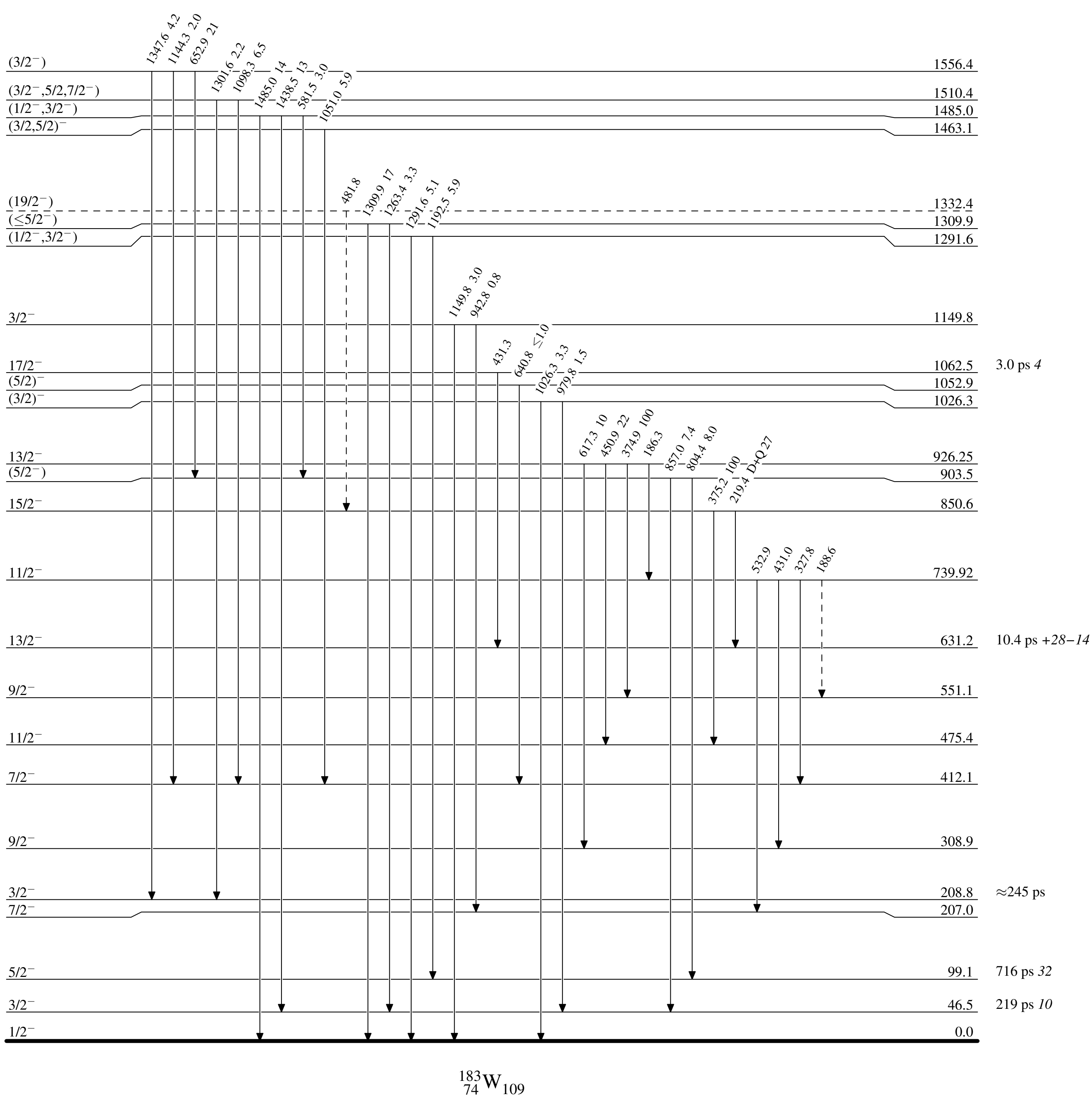
Legend

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

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

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

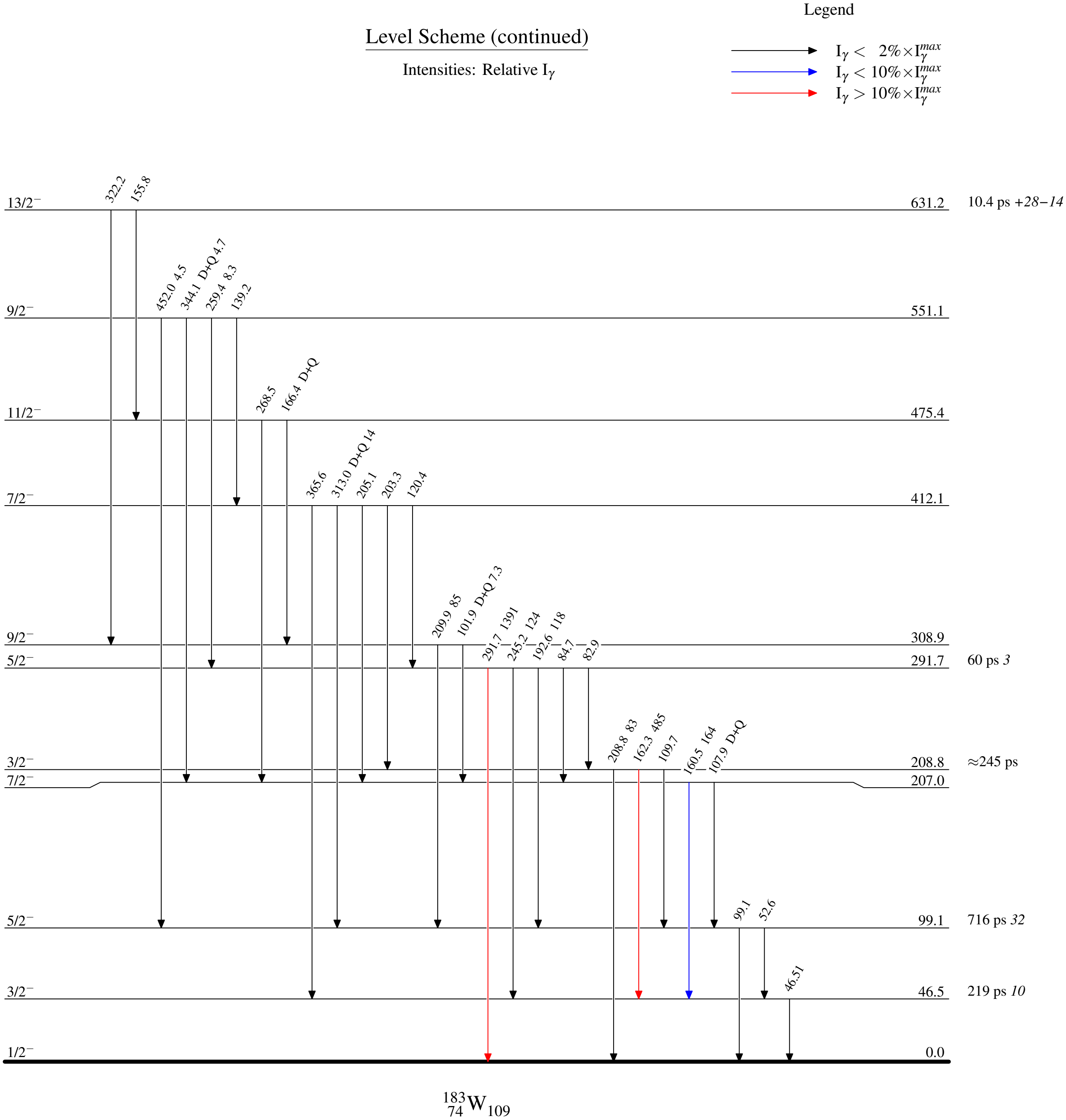
γ Decay (Uncertain)



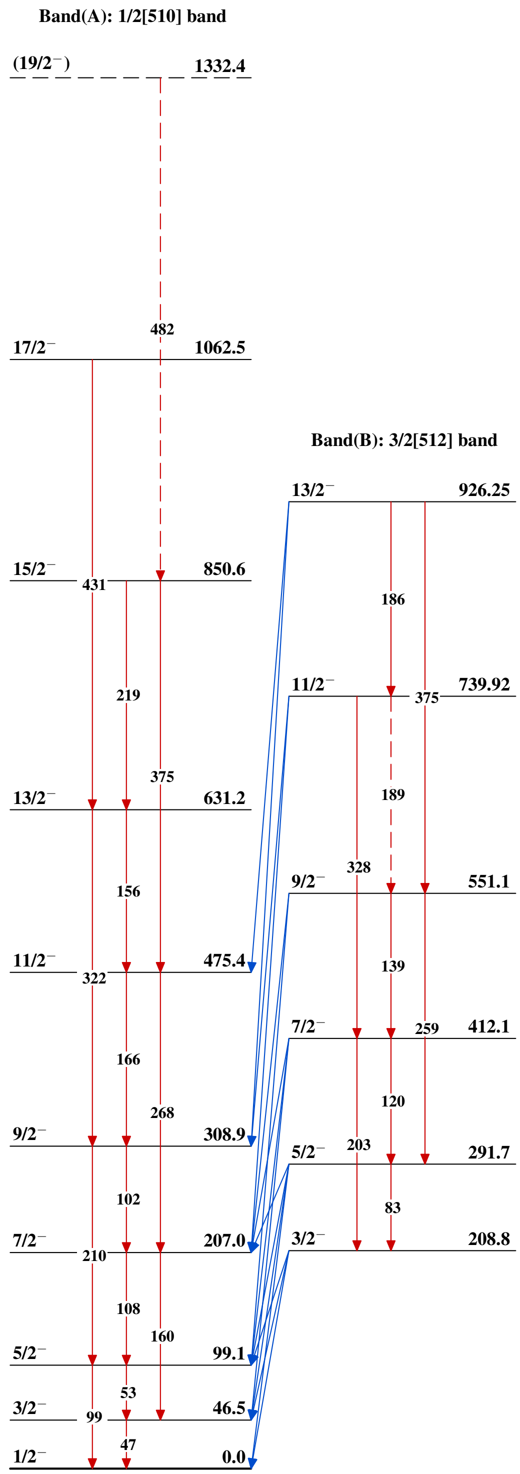
Coulomb excitation 1979Mc04,1992La02

Level Scheme (continued)

Intensities: Relative I_γ



Coulomb excitation 1979Mc04,1992La02



$^{183}_{74}W_{109}$