Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111,717 (2010)	1-Dec-2009

Q(β^-)=−7.4×10^3 *syst*; S(n)=1.04×10^4 *syst*; S(p)=7.0×10^2 *syst*; Q(α)=2.58×10^3 *syst* 2012Wa38
Note: Current evaluation has used the following Q record −7460 syst 10440 syst 700 syst 2570 syst 2003Au03,2009AuZZ.
Estimated uncertainties from 2003Au03: ΔQ-=410, ΔSN=320, ΔSP=100, ΔQA=230.
Q(εp)=6980 *110* (syst,2003Au03).
Two ^{116}Cs isomers have been identified from (β^+)-delayed proton, (β^+)-delayed α, and β^+ decay studies. Their relative position is not known.

Delayed-p and α from ^{116}Cs β^+ decay (3.8 s):

from ^{139}La(p,X) E=600 MeV, ms (1978Da07,1978Ka17,1974RaZS). Measurements: T$_{1/2}$=3.5 s *2* %I(delayed-p)/I(β^+)=0.36 *8* %I(delayed-α)/I(β^+)=8×10^{-3} *2* Q(ε)-s(p)(^{116}Xe)=6.45 MeV *30* Q(ε)+Q(α)(^{116}Xe)=12.5 MeV.
from ^{92}Mo(^{32}S,3p5n) E=190 MeV, ms (1977Bo28,1976Bo36). Measurements: T$_{1/2}$=3.9 s *4* %I(delayed-p)/I(β^+)=0.66 *13* %I(delayed-α)/I(β^+)≤3.3×10^{-3} Q(ε)-S(p)(^{116}Xe)=6.4 MeV *3*.

from ^{58}Ni,^{63}Cu(^{58}Ni,xpn). E=290 MeV, ms (1985Ti02) Measurement: T$_{1/2}$=4.0 s *3* I(delayed-p)/I(delayed-a)=200 *80* Delayed-p and α from ^{116}Cs β^+ decay (0.7 s):
from ^{92}Mo(^{32}S,3p5n) E=190 MeV, ms (1977Bo28). Measurements: T$_{1/2}$=0.65 s *10* %I(delayed-p)/I(β^+)=0.28 *7* %I(delayed-α)=4.9×10^{-2} *25* Q(ε)+Q(α)(^{116}Xe)=12.3 MeV *4*.

from ^{58}Ni,^{63}Cu(^{58}Ni,xpn). E=290 MeV, ms (1985Ti02,1982Ti05) Measurement: T$_{1/2}$=0.6 s *1* I(delayed-p)/I(delayed-γ)=16 *4*.

^{116}Cs Levels

Cross Reference (XREF) Flags

A ^{116}Ba ε decay (1.3 s)
B ^{58}Ni(^{64}Zn,αpnγ)

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0	(1$^+$)	0.70 s *4*	A	%ε+%β^+=100; %εp=2.8 *7*; %$\varepsilon\alpha$=0.049 *25* Decay branches taken from 2003Au02 evaluation. E(level): from syst of the even Cs, 2003Au02 suggest that the low spin is the g.s. T$_{1/2}$: weighted average of 0.65 s *10* (1977Bo28), 0.7 s *2* (1978Da07), 0.72 s *4* (1980Ma16), 0.6 s *1* (1985Ti02). J$^\pi$: I(delay p)/I(delay a) compared with calculations (1985Ti02), strong feeding to 0$^+$ in ^{116}Cs β^+ decay (0.70 s).
100 *syst*	4$^+$,5,6	3.85 s *13*		%ε+%β^+=100; %εp=0.51 *15*; %$\varepsilon\alpha$=0.008 *2* Decay branches taken from 2003Au02 evaluation. T$_{1/2}$: weighted average of 3.9 s *4* (1975Bo11), 3.9 s *3* (1977Bo28), 3.5 s *2* (1978Da07), 4.1 s *2* (1980Ma16), 4.0 s *3* (1985Ti02). J$^\pi$: I(delayed p)/I(delayed α compared with calculations (1985Ti02). Strong feeding to 6$^+$ in ^{116}Cs β^+ decay (3.85 s). E(level): 100 *60* (systematics,2003Au02).
0+x			B	E(level): it is possible that this level corresponds to the 3.85-s isomer. J^π=4$^+$,5,6 would be consistent with the γ−decay pattern from 416.9+x level.
191.8+x *1*			B	
416.9+x# *2*	(8$^+$)		B	
457+x			B	

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Adopted Levels, Gammas (continued)

^{116}Cs Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
633.1+x# *2*	(10+)	A	2727.9+x@ *7*	(17+)	B	6463.7+x# *7*	(24+)	B
875.8+x@ *7*	(11+)	B	3462.8+x# *5*	(18+)	B	6583.8+x@ *8*	(25+)	B
1076.3+x# *2*	(12+)	B	3601.0+x@ *7*	(19+)	B	7533.1+x# *8*	(26+)	B
1318.6+x@ *6*	(13+)	B	4481.5+x# *6*	(20+)	B	7751.6+x@ *9*	(27+)	B
1726.3+x# *2*	(14+)	B	4543.3+x@ *7*	(21+)	B	9016.3+x@ *10*	(29+)	B
1953.4+x@ *7*	(15+)	B	5480.0+x# *6*	(22+)	B	10381.4+x@ *11*	(31+)	B
2537.3+x# *3*	(16+)	B	5530.0+x@ *7*	(23+)	B			

† From least-squares fit to Eγ's.

‡ As proposed by 2006Sm04 based on angular distribution data, long cascades of stretched quadrupole transitions and systematics of neighboring Cs nuclides.

Band(A): $\nu h_{11/2}\otimes\pi h_{11/2}$, α=0.

@ Band(a): $\nu h_{11/2}\otimes\pi h_{11/2}$, α=1.

γ(^{116}Cs)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.†	Comments
191.8+x		191.8 *1*	100	0+x			Mult.: stretched Q suggested by γ-ray angular distribution.
416.9+x	(8+)	225.1 *1*	100	191.8+x			Mult.: stretched Q or unstretched mixed D+Q.
633.1+x	(10+)	176# *1*	7.8 *16*	457+x			
		216.2 *1*	100 *5*	416.9+x	(8+)		
		442# *1*	16 *5*	191.8+x			
875.8+x	(11+)	243‡ *1*	100‡	633.1+x	(10+)	M1+E2	
1076.3+x	(12+)	443.2 *1*	100	633.1+x	(10+)	E2	
1318.6+x	(13+)	243‡ *1*	<57‡	1076.3+x	(12+)	M1+E2	
		442.8 *1*	100 *11*	875.8+x	(11+)	E2	
1726.3+x	(14+)	650.0 *1*	100	1076.3+x	(12+)	E2	
1953.4+x	(15+)	226 *1*	42 *8*	1726.3+x	(14+)	M1+E2	
		634.8 *1*	100 *8*	1318.6+x	(13+)	E2	
2537.3+x	(16+)	811.0 *2*	100	1726.3+x	(14+)	E2	
2727.9+x	(17+)	189# *1*	38 *5*	2537.3+x	(16+)		
		774.5 *1*	100 *10*	1953.4+x	(15+)	E2	
3462.8+x	(18+)	925.5 *4*	100	2537.3+x	(16+)	E2	
3601.0+x	(19+)	873.1 *1*	100	2727.9+x	(17+)	E2	
4481.5+x	(20+)	1018.7 *2*	100	3462.8+x	(18+)	E2	
4543.3+x	(21+)	942.3 *1*	100	3601.0+x	(19+)	E2	
5480.0+x	(22+)	998.5 *2*	100	4481.5+x	(20+)	E2	
5530.0+x	(23+)	986.7 *2*	100	4543.3+x	(21+)	E2	
6463.7+x	(24+)	983.7 *4*	100	5480.0+x	(22+)		
6583.8+x	(25+)	1053.8 *4*	100	5530.0+x	(23+)		
7533.1+x	(26+)	1069.4# *4*	100	6463.7+x	(24+)		
7751.6+x	(27+)	1167.8 *4*	100	6583.8+x	(25+)		
9016.3+x	(29+)	1264.7# *4*	100	7751.6+x	(27+)		
10381.4+x	(31+)	1365.1# *4*	100	9016.3+x	(29+)		

† From γ-ray angular distribution data in ^{58}Ni(^{64}Zn,2pnγ). The mult=E2 corresponds to ΔJ=2 and M1+E2 to ΔJ=1 transitions.

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Adopted Levels, Gammas (continued)

$\gamma(^{116}Cs)$ (continued)

‡ Multiply placed with undivided intensity.
# Placement of transition in the level scheme is uncertain.

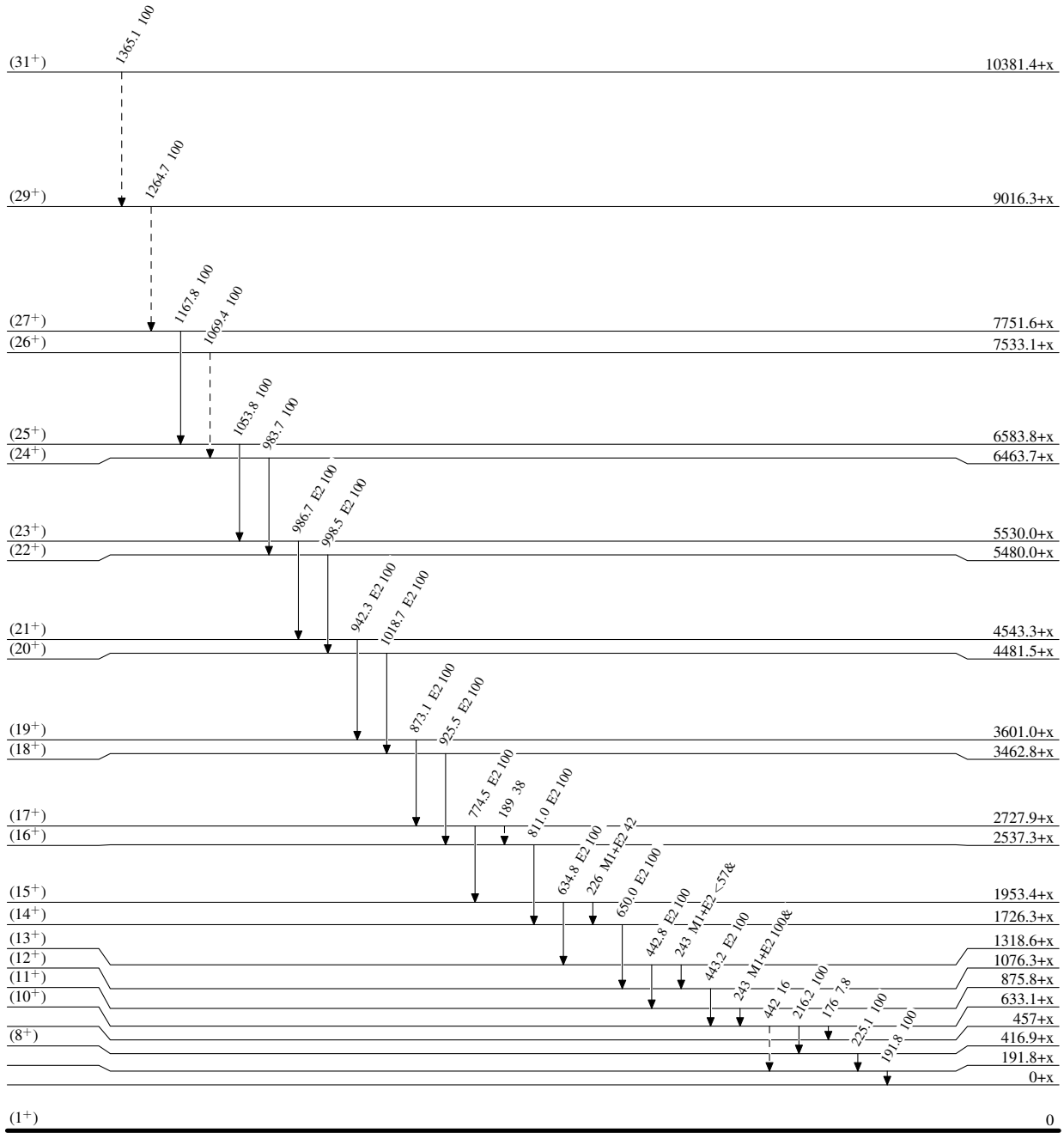
Adopted Levels, Gammas

Legend

Level Scheme

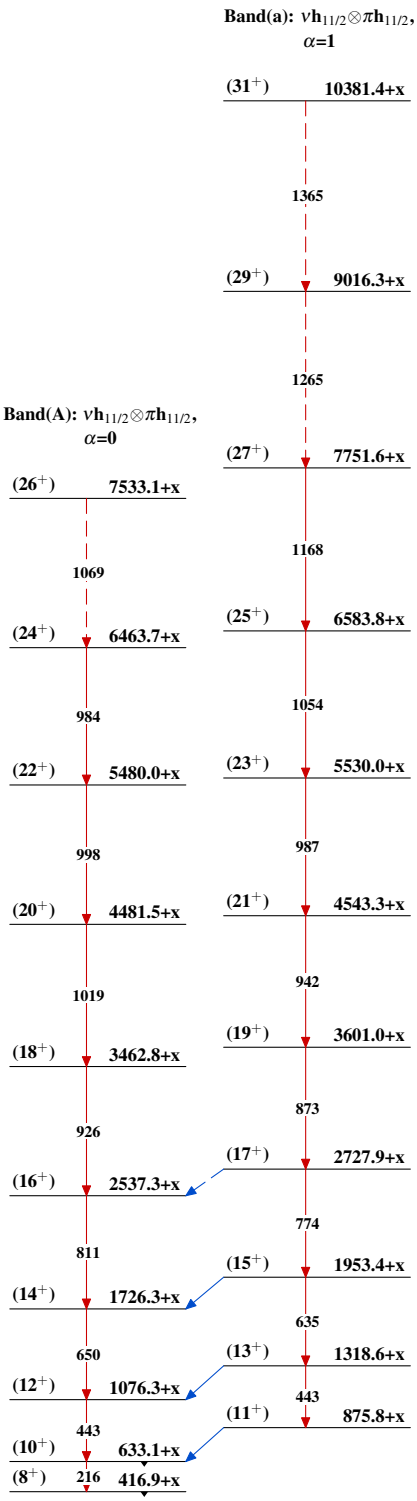
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{116}_{55}Cs_{61}$

Adopted Levels, Gammas



$^{116}_{55}Cs_{61}$