Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	20-Feb-2010

Q(β^-)=−1.65×10^4 *syst*; S(n)=1.803×10^4 *4*; S(p)=4882 *22*; Q(α)=−6794 *20* 2012Wa38
Note: Current evaluation has used the following Q record $ −17100 syst 18.58E350 4883 *26* −6777 *21* 2009AuZZ,2003Au03.
Estimated uncertainty=110 for Q(β^-) (2009AuZZ,2003Au03).
Q(εp)=2243 *20* (2009AuZZ,2003Au03).
Mass excess=−29.472 *20* MeV (1992Bo37).
1972Zi02: identification and production of ^{46}Cr in ^{32}S(^{16}O,2n) reaction.
1991Wi13: ^{46}Ti(π^+,π^-) E=450 MeV, measured cross section for double isobaric analog state using LAMPF facility and Large Acceptance spectrometer (las). Measured dσ/dΩ=0.25 μb/sr 10 at 5°.
1990We05: ^{46}Ti(π^+,π^-) E=33.9 MeV, measured cross section and $\sigma(\theta)$ for double isobaric analog state using LAMPF facility, Measured dσ/dΩ=3.1 μb/sr 8 at 0° and 2.5 μb/sr 6 at 25.1°.
1994Bl10: ^{9}Be(^{58}Ni,X) E=650 MeV/nucleon, Fragment separator FRS at GSI facility, measured cross section for the production of ^{46}Cr.
2005On03: measured half-life of ^{46}Cr g.s.
Structure calculations using shell model: 2008Ma44, 2007He32, 2002Ca48: levels, B(E2), mirror states, etc.

^{46}Cr Levels

Cross Reference (XREF) Flags

- A ^{46}Mn ε decay (36.2 ms)
- B ^{47}Fe εp decay (21.9 ms)
- C ^{12}C(^{36}Ar,2nγ)
- D Coulomb excitation

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0#	0$^+$	0.26 s *6*	ABCD	%ε+%β^+=100 T$_{1/2}$: from 1972Zi02, timing of β decays. Other: 0.24 s *14* (2005On03) from β(993γ) coin decay curve. Additional information 1.
892.16# *10*	2$^+$	5.4 ps *12*	ABCD	J$^\pi$: level is Coulomb excited. T$_{1/2}$: from B(E2)=0.093 *20* (2005Ya26) in Coulomb excitation.
1987.1# *3*	(4$^+$)		ABC	
3196.5@ *6*	(3$^-$)		BC	
3226.9# *6*	(6$^+$)		C	
3296 *3*			C	
3494.3 *7*			C	
3593.7@ *7*	(4$^-$)		C	
3682.2 *16*			C	
3715.8 *9*			C	
3778.1 *12*			C	
3986.7@ *7*	(5$^-$)		C	
4235 *3*			C	
4305.5 *12*			C	
4434.4 *10*			C	
4817.4# *8*	(8$^+$)		C	
4830@ *3*	(6$^-$)		C	
5117 *4*			C	
5346@ *3*	(7$^-$)		C	

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Adopted Levels, Gammas (continued)

^{46}Cr Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
6179.5[#] *11*	(10$^+$)	C	
8162.5?[#] *15*	(12$^+$)	C	
9152 *24*	(4$^+$)	A	T=2 E(level): from 2007Do17, see detailed comment in ^{46}Mn ε decay. J$^{\pi}$: T=2 quadruplet in ^{46}Sc (g.s.,4$^+$), ^{46}Ti (9168,4$^+$,probable IAS of ^{46}Sc g.s.), ^{46}Cr (9152 state) and ^{46}Mn (g.s.). Superallowed type β^+ decay (log ft≈3.4) from ^{46}Mn g.s. to the 9152 level of ^{46}Cr is consistent with this interpretation. Also mirror analogy with 9168, 4$^+$ state of ^{46}Ti. This state decays mainly by proton emission, but only 17.3% *12* branch is so far accounted in measurements of 2007Do17 and 1992Bo37. Energetically, two-proton and α-decay modes are also possible but these are expected to be small (2007Do17).

[†] From least-squares fit to Eγ's.
[‡] As proposed in 2007Ga03 based on $\gamma(\theta)$ data for selected transitions observed in ^{12}C(^{36}Ar,2nγ) and mirror analogy with ^{46}Ti and ^{46}V.
[#] Band(A): Yrast (T=1) band. Structure is similar to T=1 states in mirror nuclide ^{46}Ti and ^{46}V.
[@] Band(B): ΔJ=1 band based on (3$^-$).

$\gamma(^{46}Cr)$

E$_i$(level)	J$_i^{\pi}$	E$_\gamma$[†]	I$_\gamma$	E$_f$	J$_f^{\pi}$	Mult.	Comments
892.16	2$^+$	892.15[‡] *10*	100	0.0	0$^+$	[E2]	B(E2)(W.u.)=19 *4*
1987.1	(4$^+$)	1094.9[‡] *3*	100	892.16	2$^+$		
3196.5	(3$^-$)	2304.6 *7*	100	892.16	2$^+$	D[#]	
3226.9	(6$^+$)	1239.9 *5*	100	1987.1	(4$^+$)	Q[#]	
3296		2404 *3*	100	892.16	2$^+$		
3494.3		1506.9 *8*	100	1987.1	(4$^+$)		
3593.7	(4$^-$)	397.4 *6*	100 *13*	3196.5	(3$^-$)	D[#]	
		1605.3 *15*	75 *19*	1987.1	(4$^+$)		
3682.2		1695.0 *15*	100	1987.1	(4$^+$)		
3715.8		519.3 *6*	100	3196.5	(3$^-$)		
3778.1		581.7 *11*	50 *30*	3196.5	(3$^-$)		
		1790 *3*	100 *60*	1987.1	(4$^+$)		
3986.7	(5$^-$)	393.0 *15*	12 *7*	3593.7	(4$^-$)		
		492.3 *7*	60 *11*	3494.3			
		760.3 *10*	43 *13*	3226.9	(6$^+$)		
		790.1 *8*	100 *22*	3196.5	(3$^-$)	Q[#]	
4235		2248 *3*	100	1987.1	(4$^+$)		
4305.5		711.8 *9*	100	3593.7	(4$^-$)		
4434.4		841.0 *22*	22 *13*	3593.7	(4$^-$)		
		1207.4 *9*	100 *17*	3226.9	(6$^+$)		
4817.4	(8$^+$)	1590.4 *6*	100	3226.9	(6$^+$)		
4830	(6$^-$)	1236 *3*	100	3593.7	(4$^-$)		
5117		1401 *3*	100	3715.8			
5346	(7$^-$)	1359 *3*	100	3986.7	(5$^-$)		
6179.5	(10$^+$)	1362.1 *7*	100	4817.4	(8$^+$)		
8162.5?	(12$^+$)	1983.0[@] *10*	100	6179.5	(10$^+$)		

[†] From ^{12}C(^{36}Ar,2nγ), unless otherwise stated.

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Adopted Levels, Gammas (continued)

$\gamma(^{46}Cr)$ (continued)

‡ Weighted average of values from ε decay, εp decay and $^{12}C(^{36}Ar,2n\gamma)$.
# The $\gamma(\theta)$ patterns in $^{12}C(^{36}Ar,2n\gamma)$ are consistent with $\Delta J=2$, quadrupole for 1240γ and 790γ; and $\Delta J=1$ for 2305γ and 397γ.
@ Placement of transition in the level scheme is uncertain.

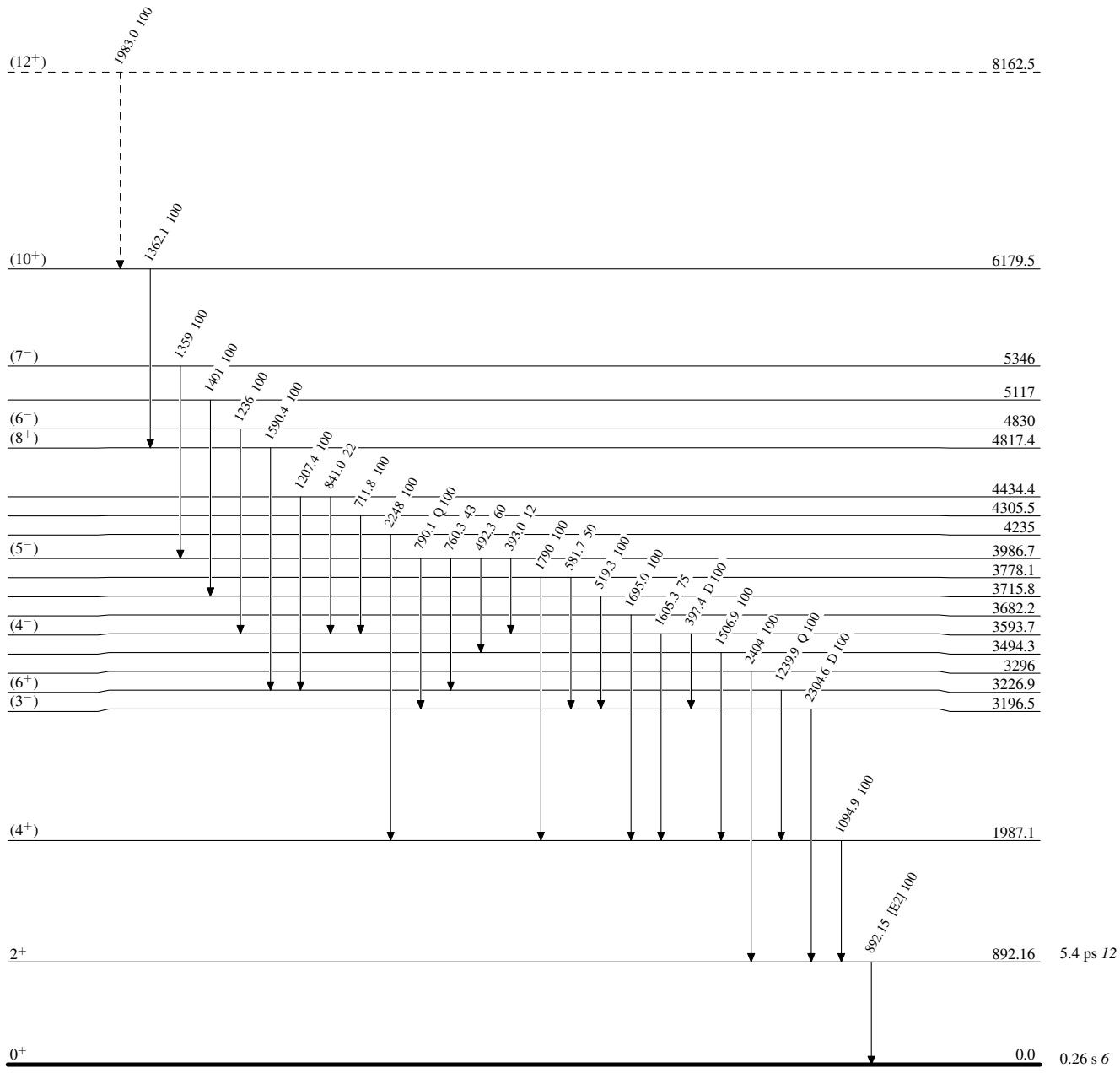
Adopted Levels, Gammas

Legend

Level Scheme

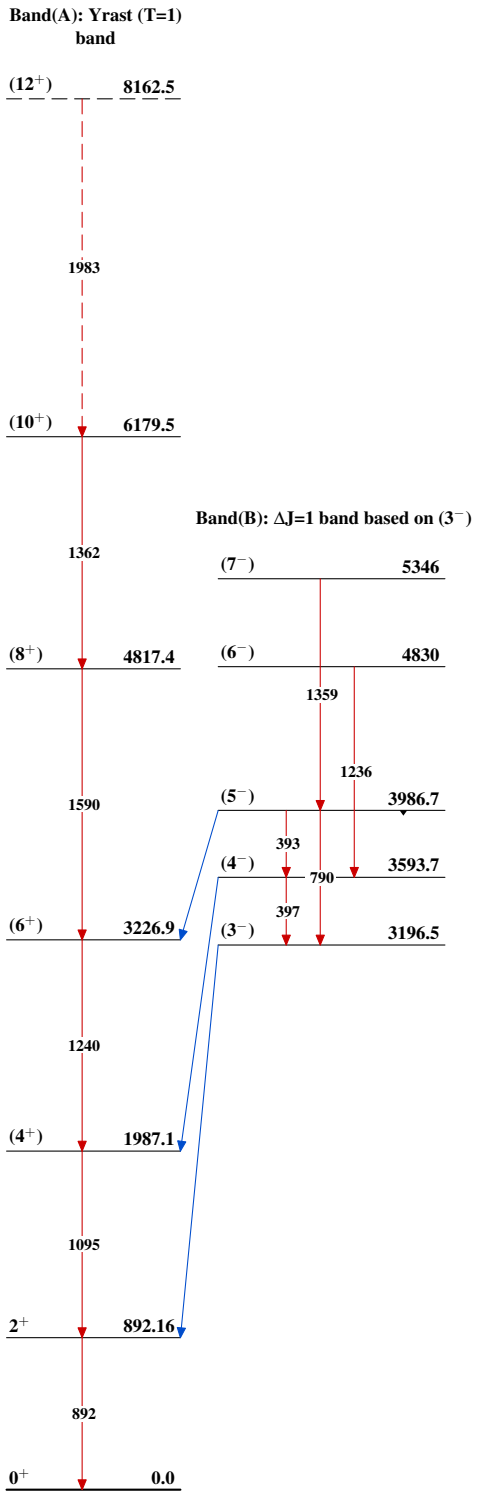
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{46}_{24}Cr_{22}$

Adopted Levels, Gammas



$^{46}_{24}Cr_{22}$