Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 125, 395 (2015)	31-Mar-2014

Q(β^-)=−2475 *25*; S(n)=6059 *15*; S(p)=5150 *60*; Q(α)=6495 *15* 2012Wa38

Identification:
1956Ch77: Determined ^{244}Cm(α,n) excitation function 1954Gh12: ^{247}Cf produced by irradiating ^{238}U with ^{14}N ions.
at the Berkeley Crocker Laboratory 60 inch cyclotron. It was then followed by chemical separation. Measured half-life≈2.7 h.
1954Hu50: He ion bombardment of ^{244}Cm followed by fast chemical Measured x-rays and determined half-life (2.5 h and ≈3 h).

Other experimental work:
1987Ch30: Measured ^{249}Cf(^{16}O,^{16}O 2n) production cross-sections.
1987Gr13: Measured ^{249}Cf(^{136}Xe,X) production cross-sections.
1987We01: Measured ^{248}Cm(^{129}Xe,X) and ^{248}Cm(^{132}Xe,X) production cross-sections.

Theoretical and systematical studies:
2013Zd01: Calculated half-lives for α and cluster decay using a phenomenological model based on Gamow theory.
2012Ni16: Calculated α decay $T_{1/2}$ for transitions from ground-state to favored rotational bands using Multicluster Channel Model.
2012Zh01: Comparison of the low-lying one-quasineutron band for N=149 isotones between the experimental values and calculated values using the cranked shell model (CSM) with pairing correlations.
2011Ad15,2010Ad17: One-quasiparticle levels using the microscopic-macroscopic modified TCSM, QPM and the self-consistent SHFB approaches.
2011Ha06: Systematic analysis of experimental work in N=149 isotones.
2011Zh36: Systematics and calculated partial half life of α decay to members of favored band. Accurate expressions are proposed for the evaluation of partial half-lives of these transitions based on microscopic quantum tunneling theory.
2010Ni02: Systematics and calculations of $T_{1/2}$ and relative intensities of α decay within the generalized density-dependent cluster model.
2010Ni02: Systematics and calculations of $T_{1/2}$ and relative intensities of α decay within the generalized density-dependent cluster model.
2006Sh19: Calculated energy levels of ground-state rotational band in N=149 isotones.
2005Pa73: Calculated neutron one-quasiparticle states of heaviest nuclei within a macroscopic-microscopic approach.
2002Du16: Calculated partial half-lives for α and cluster decays.
1997Mo25: Calculated ground-state binding energy, proton and neutron pairing gaps, neutron and proton separation energies, Q values and partial half-lives for α and β decays.
1995Mo29,1980Ho32: Calculated ground-state masses and nuclear ground-state deformations.
1993Bu09: Calculated partial α decay half-life, α branching, and nuclear radius using the cluster model predictions.
1985Lo17: Calculation of spontaneous fission half-life of ground-state.
1981Mo24: Calculated ground-state electric multipole moments Q_2, Q_4 and masses.
1980Ho32: Calculated fission-barrier heights, deformation and energy at saddle-point were.

^{247}Cf Levels

Cross Reference (XREF) Flags

A ^{251}Fm α decay
B ^{247}Es ε decay (4.55 min)

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0[†]	(7/2$^+$)	3.11 h *3*	AB	%ε=99.965 *5*; %α=0.035 *5* Branchings were determined by 1984Ah02 from measured alpha and Cm K x-ray intensity ratio of 4.7×10^{-4} *5*; the K x-ray intensity was taken as 72.3 per 100 ε decays.

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Adopted Levels, Gammas (continued)

^{247}Cf Levels (continued)

E(level)	J^π	XREF	Comments
			$T_{1/2}$: From 1984Ah02 and 1979Ah03. Other measurements: 2.45 h *15* (1956Ch77), 2.5 h (1954Hu50).
			J^π: Analogy to ^{245}Cm suggests 7/2[624] neutron orbital.
55.00† *11*	$(9/2^+)$	A	J^π: M1+E2 55.0γ to $(7/2^+)$ g.s.
122.09† *11*	$(11/2^+)$	A	J^π: E2 122.1γ to $(7/2^+)$ g.s.; M1+E2 67.1γ to $(9/2^+)$.
201.0† *4*	$(13/2^+)$	A	J^π: Energy fit to the 7/2[624] band.
383.2‡ *3*	$(5/2^+)$	A	J^π: M1 383.2γ to $(7/2^+)$ g.s.; energy fit to the 5/2[622] band.
427.2‡ *4*	$(7/2^+)$	A	J^π: γ's to $(5/2^+)$ and $(9/2^+)$ states; energy fit to the 5/2[622] band.
480.40# *9*	$(9/2^-)$	A	J^π: E1 358.3γ to $(11/2^+)$ and E1 480.4γ to $(7/2^+)$. Favoured α transition from ^{251}Fm with HF=1.63 *13*.
531.99# *21*	$(11/2^-)$	A	J^π: γ's to $(9/2^-)$, $(9/2^+)$, $(11/2^+)$ and $(13/2^+)$ states; energy fit to the 9/2[734] band.
551.0‡ *10*	$(11/2^+)$	A	J^π: γ to $(9/2^+)$ state; energy fit to 5/2[622] band.
595# *4*	$(13/2^-)$	A	J^π: Energy fit to the 9/2[734] band.
634‡ *5*	$(13/2^+)$	A	J^π: Energy fit to 5/2[622] band $(11/2^+)$ member.
678.0@ *6*	$(7/2^-)$	A	J^π: γ's to the $(7/2^+)$ and $(9/2^+)$; analogy to a similar band at 644 keV in ^{245}Cm, 1973Ah02 suggested the $7/2^-$, 7/2[743] assignment.
738.0@ *8*	$(9/2^-)$	A	J^π: γ's to the $(9/2^+)$, $(11/2^+)$ states of the g.s. band; energy fit to the 7/2[743] band.

† Band(A): 7/2[624] band. α=6.1.
‡ Band(B): 5/2[622] band. α=5.9. Population and depopulation of the $9/2^+$ (expected at 484 keV) member should be obscured by the strongly populated $(9/2^-)$ state at 480.4 MeV.
# Band(C): 9/2[734] band. α=4.8 By considering the relative values of the reduced transition rates for γ's from the $9/2^-$ member of this band to the 7/2, 9/2 and 11/2 members of the g.s. band, 1973Ah02 suggested that this band is strongly CORIOLIS mixed.
@ Band(D): 7/2[743] band. α=6.7.

$\gamma(^{247}Cf)$

E_i(level)	J_i^π	E_γ	I_γ†	E_f	J_f^π	Mult.	δ	α#
55.00	$(9/2^+)$	55.0 *2*	100	0.0	$(7/2^+)$	M1+E2	0.51 *5*	122 *11*
122.09	$(11/2^+)$	67.1 *2*	100 *18*	55.00	$(9/2^+)$	M1+E2	0.45 *10*	50 *8*
		122.1 *2*	100 *18*	0.0	$(7/2^+)$	E2		9.12
383.2	$(5/2^+)$	383.2 *3*	100	0.0	$(7/2^+)$	M1		0.943
427.2	$(7/2^+)$	44.0 *4*		383.2	$(5/2^+)$			
		372.2 *4*		55.00	$(9/2^+)$			
480.40	$(9/2^-)$	358.3 *1*	33.0‡ *21*	122.09	$(11/2^+)$	E1		0.0319
		425.4 *1*	100‡ *6*	55.00	$(9/2^+)$	E1		0.0225
		480.4 *1*	41.1‡ *21*	0.0	$(7/2^+)$	E1		0.0178
531.99	$(11/2^-)$	51.4 *4*		480.40	$(9/2^-)$			
		331.0 *3*	65 *13*	201.0	$(13/2^+)$			
		410.0 *3*	93 *13*	122.09	$(11/2^+)$			
		477.0 *3*	100 *15*	55.00	$(9/2^+)$			
551.0	$(11/2^+)$	496 *1*	100	55.00	$(9/2^+)$			
678.0	$(7/2^-)$	623.0 *8*	27 *8*	55.00	$(9/2^+)$			
		678.0 *8*	100 *23*	0.0	$(7/2^+)$			
738.0	$(9/2^-)$	616 *1*	≈100	122.09	$(11/2^+)$			
		683 *1*	≈80	55.00	$(9/2^+)$			

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Adopted Levels, Gammas (continued)

$\gamma(^{247}Cf)$ (continued)

† Relative photon intensities normalized to 100 for the strongest γ from each level.

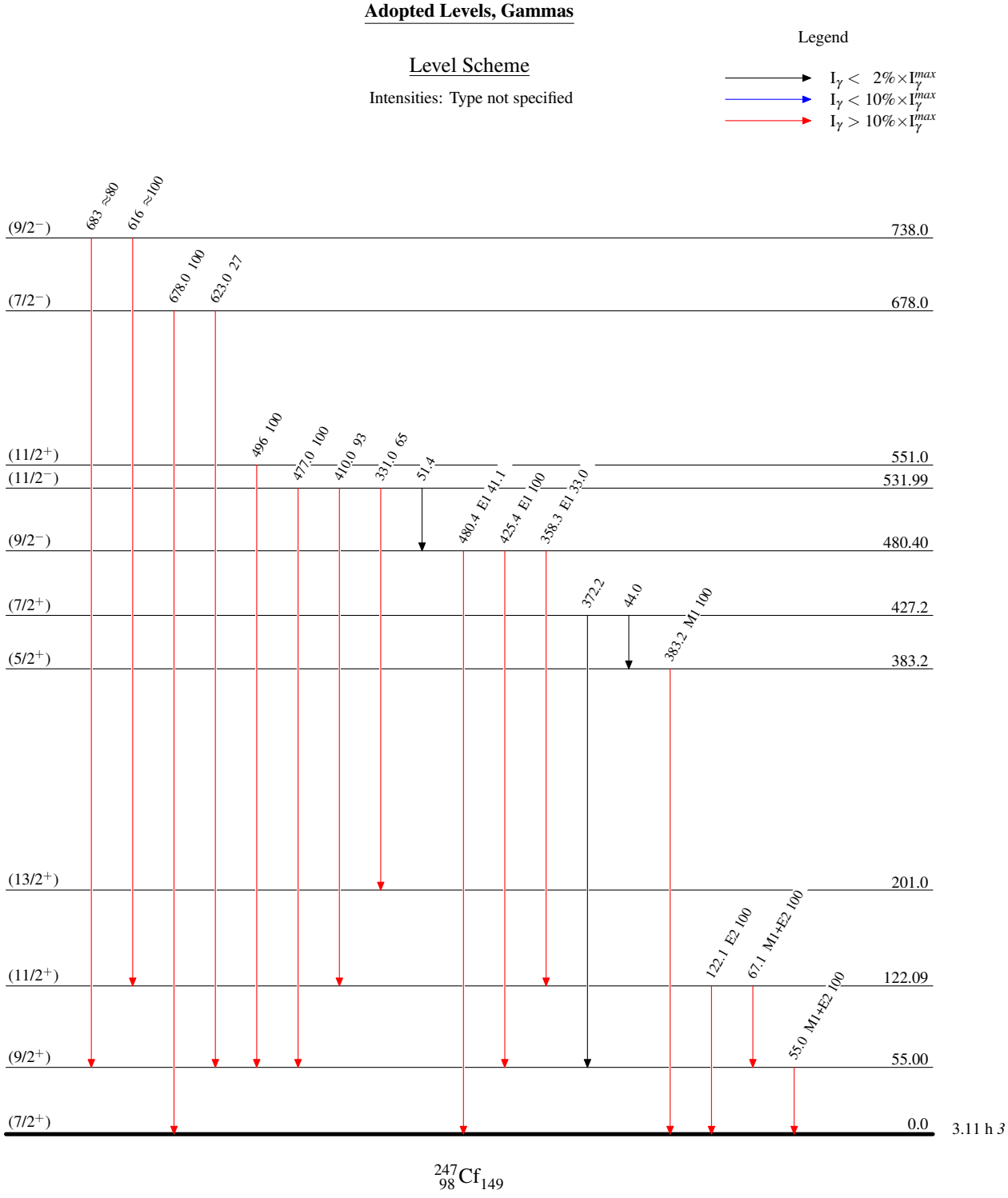
‡ Relative photon intensities of transitions de-exciting the 480.4-keV level could be incorrect, if these photons include γ's de-exciting an obscured $9/2^+$ member of the 5/2[622] band, expected at about 484 keV.

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.

Adopted Levels, Gammas

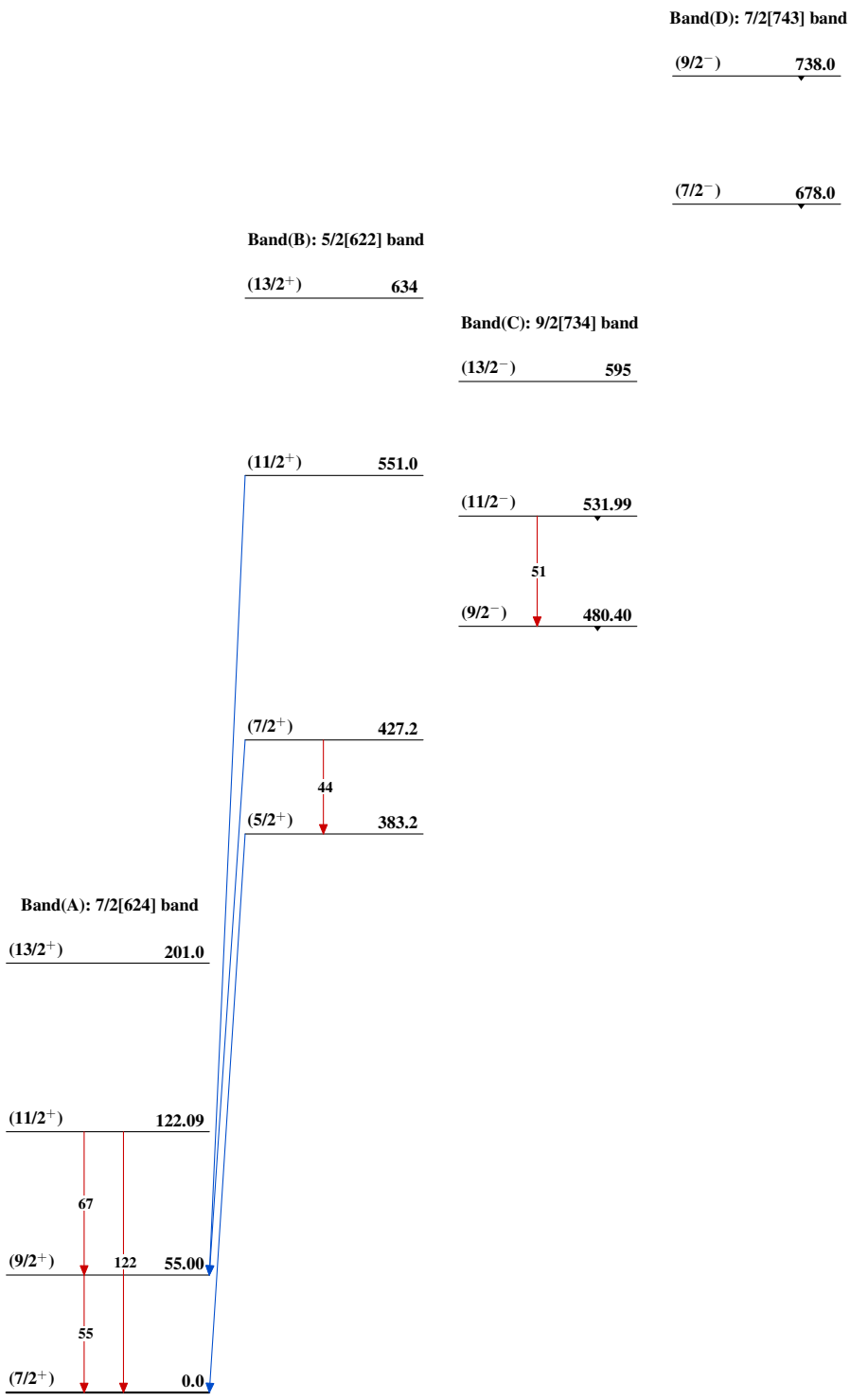
Level Scheme

Intensities: Type not specified



$^{247}_{98}Cf_{149}$

Adopted Levels, Gammas



$^{247}_{98}Cf_{149}$