Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 121, 695 (2014)	30-Sep-2013

$Q(\beta^-)$=−3757 *SY*; S(n)=6467 *SY*; Q(p)=4033 *SY*; $Q(\alpha)$=7418 *SY*   2012Wa38
$\Delta Q(\beta^-)$=236; ΔS(n)=115; ΔS(p)=230; $\Delta Q(\alpha)$=100 (2012Wa38).
S(2n)=14478 syst *201*; S(2p)=7290 syst *114* (2012Wa38).

First identification: 1967Fi04 using ^{242}Cm,^{244}Cm(^{3}He,xn) followed by chemical separation and 1967Si08 using
    ^{235}U,^{236}U(^{12}C,xn) with excitation function.

Theoretical calculations:

2013Zd01: $T_{1/2}$ for α decay calculated with phenomenological model based on Gamow theory with WKB approximation for
    Coulomb barrier penetration.
2012Zh01: β_2, β_4, moment of inertia, alignments calculated with a particle conserving method based on the cranked shell model.
2012Po01: calculated α decay $T_{1/2}$ with a universal decay law using α-like R matrix theory.
2011Ad15: calculations of one-quasi-particle states.
2009Sa25: calculated $Q(\alpha)$ and $T_{1/2}$ within the Coulomb and Proximity Potential model.
2008Th05: calculated E(K x-ray) using a Dirac Hartree Fock model.
2005Pa73: single quasi-particle energies calculated in a macroscopic-microscopic model.
2005Si10,2005Si26: calculated σ and fission ratio for ^{236}U(^{12}C,5n) using a statistical model with shell effects.
1994EfZW: calculation of spontaneous fission partial $T_{1/2}$.
1983Ga20: calculated mass excess differences with a macroscopic-microscopic model.

^{243}Cf Levels

Cross Reference (XREF) Flags

A	^{247}Fm α decay (31 s)
B	^{247}Fm α decay (5.1 s)

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0[†]	(1/2$^+$)	10.7 min *5*	AB	%ε+%$\beta^+\approx$86; %$\alpha\approx$14
				$T_{1/2}$: weighted average of 12.5 min *10* (1967Fi04) and 10.3 min *5* (1967Si08).
				J^π: unhindered α decay from ^{247}Fm 5.1-sec isomeric level and systematics of N=145
				isotones suggests J^π=1/2$^+$ with configuration 1/2$^+$[631].
				%ε+%β^+,%α: 1967Si08 estimate $(\alpha+\varepsilon)/7060\alpha$=10 *2* from measured cross section for
				7060α of ^{243}Cf and calculated maximum cross sections for ^{235}U(^{12}C,4n),
				^{236}U(^{12}C,6n) reactions. From relative intensities of ^{243}Cf α's, 7060α/7170$\alpha\approx$2.5,
				branchings were calculated to be $\alpha/(\alpha+\varepsilon)\approx$0.14, $\varepsilon/(\alpha+\varepsilon)\approx$0.86.
$\approx$7[†]	(3/2$^+$)		A	E(level): from systematics of 3/2$^+$ to 1/2$^+$ spacings in the 1/2$^+$[631] band, E=7 keV *2* is
				extrapolated by 2006He27.
$\approx$67[†]	(5/2$^+$)		A	J^π: from band assignment.
$\approx$149[‡]	(5/2$^+$)		A	J^π: from systematics of the energy difference between the 7/2$^+$ member and the 5/2$^+$
				bandhead of the 5/2$^+$[622] Nisson level.
$\approx$193[‡]	(7/2$^+$)		A	J^π: from band assignment.
$\approx$315[#]	(7/2$^+$)		A	J^π: unhindered α decay from ^{247}Fm ground state with J^π=(7/2$^+$) and configuration
				7/2$^+$[624]; the same J^π and configuration are suggested.

Adopted Levels, Gammas (continued)

^{243}Cf Levels (continued)

† Proposed band based on 1/2$^+$[631] Nilsson level.
‡ Proposed band based on 5/2$^+$[622] Nilsson level.
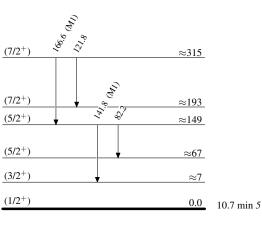$^\#$ Proposed bandhead of 7/2$^+$[624] Nilsson level.

$\gamma(^{243}\text{Cf})$

E_i(level)	J_i^π	E_γ†	E_f	J_f^π	Mult.‡	$\alpha$$^\#$	Comments
≈149	(5/2$^+$)	82.2 *2*	≈67	(5/2$^+$)			
		141.8 *2*	≈7	(3/2$^+$)	(M1)	14.00	α(K)=10.88 *16*; α(L)=2.33 *4*; α(M)=0.573 *9*
							α(N)=0.1589 *24*; α(O)=0.0412 *6*; α(P)=0.00797 *12*;
							α(Q)=0.000469 *7*
≈315	(7/2$^+$)	121.8 *2*	≈193	(7/2$^+$)			
		166.6 *2*	≈149	(5/2$^+$)	(M1)	8.89	α(K)=6.93 *10*; α(L)=1.471 *22*; α(M)=0.362 *6*
							α(N)=0.1002 *15*; α(O)=0.0260 *4*; α(P)=0.00502 *8*; α(Q)=0.000295
							5

† From ^{247}Fm α decay (31 s).
‡ From α(K)exp measured in ^{247}Fm α decay (31 s).
$^\#$ Additional information 1.

Adopted Levels, Gammas

Level Scheme

$^{243}_{98}\text{Cf}_{145}$