^{142}Cs β^- decay 1980Sc16,1974WrZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli	NDS 112, 1949 (2011)	1-Jun-2010

Parent: ^{142}Cs: E=0.0; $J^\pi=0^-$; $T_{1/2}$=1.684 s *14*; Q(β^-)=7308 *11*; %β^- decay=100.0

Measured: γ, $\gamma\gamma$ (1985Bu28,1980Sc16,1979Sc24,1974WrZY,1971La04), $\gamma\gamma(\theta)$ (1980Sc16), absolute Iγ (1984So18) β, $\beta\gamma$ (1982Pa24,1981De25,1981Ke07,1978Wo15,1978Wu04,1972AdZP), delayed neutrons (1981En05,1980Lu04,1979En02,1977Sh01,1977Re06, 1977Re05,1975As05,1969Ta04,1969Am01), Eβ(av) (1982Al01), mass (1979Ep01), hfs (1981Th06,1983Mu12,1979Ek02,1978Ek05).

1990Ma25: $\beta\gamma\gamma$(t), deduced $T_{1/2}$, source from fission product mass separation.

Level scheme is that of 1980Sc16.

^{142}Ba Levels

E(level)	J^π†	$T_{1/2}$‡	E(level)	J^π†	$T_{1/2}$‡	E(level)	J^π†
0.0	0^+		1639.60 *10*	0^+	<16 ps	3144.38 *23*	(1)
359.596 *14*	2^+	65 ps *2*	1693.0? *3*	2^+		3261.7 *4*	(1)
834.81 *9*	4^+	11.9 ps *9*	1781.50 *10*			3283.29 *19*	(1)
1292.20 *14*	(3^-)		2127.9 *3*	0^+		3573.08 *24*	(1)
1326.48 *5*	1^-	10 ps *5*	2341.77 *10*	1		4369.3 *4*	(1)
1424.06 *6*	2^+	<9 ps	2569.78 *11*			5280.4 *4*	
1535.53 *7*	0^+	9 ps *7*	2882.57 *16*	$(1,2^+)$			

† Adopted values.
‡ From $\beta\gamma\gamma$(t) (1990Ma25).

β^- radiations

E(decay)†	E(level)	Iβ^-‡	Log *ft*	Comments
(2028 *11*)	5280.4	0.8 *1*	5.07 *6*	av Eβ=787.8 *50*
(2939 *11*)	4369.3	0.4 *1*	6.03 *11*	av Eβ=1203.9 *51*
(3735 *11*)	3573.08	1.0 *1*	6.07 *5*	av Eβ=1574.0 *52*
(4025 *11*)	3283.29	1.3 *2*	6.09 *7*	av Eβ=1709.4 *52*
(4046 *11*)	3261.7	0.5 *1*	6.52 *9*	av Eβ=1719.5 *52*
(4164 *11*)	3144.38	0.6 *1*	6.49 *8*	av Eβ=1774.4 *52*
(4425 *11*)	2882.57	0.17 *12*	7.2 *3*	av Eβ=1897.1 *52*
(4738 *11*)	2569.78	0.5 *1*	6.81 *9*	av Eβ=2043.7 *52*
(4966 *11*)	2341.77	1.5 *2*	6.42 *6*	av Eβ=2150.7 *52*
(5180 *11*)	2127.9	0.52 *6*	6.96 *5*	av Eβ=2251.1 *52*
(5527 *11*)	1781.50	0.46 *11*	7.14 *11*	av Eβ=2413.7 *52*
(5615 *11*)	1693.0?	0.5 *10*	9.0[1u] *9*	av Eβ=2433.5 *52*
(5668 *11*)	1639.60	2.0 *2*	6.55 *5*	av Eβ=2480.3 *52*
(5772 *11*)	1535.53	4.3 *5*	6.25 *5*	av Eβ=2529.1 *52*
(5884 *11*)	1424.06	1.9 *2*	8.58[1u] *5*	av Eβ=2560.1 *52*
5973 *35*	1326.48	19.8 *22*	5.66 *5*	av Eβ=2627.2 *52*
(6948 *11*)	359.596	7.2 *12*	8.46[1u] *8*	av Eβ=3062.5 *52*
7335 *20*	0.0	56 *5*	5.59 *4*	av Eβ=3249.0 *52*
				E(decay): E(β^-)=7315 *15* (1992Pr04,1993PrZZ).

† From 1981De25.
‡ Absolute intensity per 100 decays.

$\gamma(^{142}Ba)$

Iγ normalization: From I(359γ)=27.2% *27* (1984So18).

E_γ[‡]	I_γ[‡#a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	α[†]	Comments
[x]100.6[&] *5*									
209.1 *5*	0.50 *5*	1535.53	0^+	1326.48	1^-				
[x]325.0[&] *5*	0.26 *8*								
359.598 *14*	100.0 *17*	359.596	2^+	0.0	0^+	E2		0.0257	B(E2)(W.u.)=32.1 *10* α(K)=0.0212 *3*; α(L)=0.00356 *5*; α(M)=0.000748 *11*; α(N+..)=0.000183 *3* α(N)=0.0001589 *23*; α(O)=2.31×10^{-5} *4*; α(P)=1.232×10^{-6} *18* Mult.: K/L=5.2 (1973Kh05,1974KhZV), γγ(θ) (1980Sc16). E_γ: from 1979Bo26. I_γ: Iγ=27.2% *27* if Iγ=100 (1984So18).
[x]401.4[&] *6*	0.20 *7*								
457.26 *15*	0.40 *4*	1292.20	(3^-)	834.81	4^+				E_γ: 459.1 *8* in 1974WrZY.
475.17 *9*	1.10 *4*	834.81	4^+	359.596	2^+	E2		0.01135	B(E2)(W.u.)=45 *4* α(K)=0.00952 *14*; α(L)=0.001455 *21*; α(M)=0.000303 *5*; α(N+..)=7.49×10^{-5} *11* α(N)=6.48×10^{-5} *9*; α(O)=9.57×10^{-6} *14*; α(P)=5.70×10^{-7} *8* Mult.: Adopted value. Q from γγ(θ).
[x]510.71[&] *16*	7.8 *9*								I_γ: may be $\gamma^\pm$ from pair conversion (at least partly).
[x]608.3[&] *3*	1.20 *22*								
[x]858.30 *15*	0.92 *12*								
932.82 *20*	2.0 *3*	1292.20	(3^-)	359.596	2^+	D+Q	−5.9 *+32−73*		δ: if J=2, δ=−0.34 *22* γγ(θ). I_γ: the weaker part of 966γ doublet (from γγ in 1980Sc16) with Iγ 1.5% of total I(966γ).
[x]966.89 *7*	≈0.55								
966.89 *7*	33 *3*	1326.48	1^-	359.596	2^+	D+(Q)	−0.013 *8*		I_γ: Iγ=9.0% *9* if Iγ=33 *3* (1984So18); Iγ=28.3 *15* in 1974WrZY Iγ(967):Iγ(1326)=44.4 *4*/55.6 *4* (1990Ma25).
[x]985.8 *8*	1.35 *17*								E_γ: 986.95 *21* in 1974WrZY Iγ from 1974WrZY.
1015.3 *1*	0.70 *5*	2341.77	1	1326.48	1^-				
1064.54 *7*	3.30 *7*	1424.06	2^+	359.596	2^+	E2+(M1)	>10	0.001586 *23*	B(E2)(W.u.)>0.48 α=0.001586 *23*; α(K)=0.001363 *20*; α(L)=0.0001773 *25*; α(M)=3.64×10^{-5} *6*; α(N+..)=9.12×10^{-6} α(N)=7.84×10^{-6} *11*; α(O)=1.194×10^{-6} *17*; α(P)=8.46×10^{-8} *12*

^{142}Cs β^- decay 1980Sc16,1974WrZY (continued)

$\gamma(^{142}Ba)$ (continued)

E_γ[‡]	I_γ[‡#a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	Comments
								Mult.: from Adopted Levels. Q(+D) from $\gamma\gamma(\theta)$ (1980Sc16). δ: from $\gamma\gamma(\theta)$ (1980Sc16).
[x]1099.1[&] *9*	0.5 *3*							
1101.1 *2*	1.0 *3*	2882.57	$(1,2^+)$	1781.50				I_γ: from 1974WrZY.
[x]1118.6[&] *5*	0.42 *15*							
[x]1137.0[&] *3*	0.66 *12*							
1175.93 *6*	15.3 *3*	1535.53	0^+	359.596	2^+	Q		I_γ: Iγ=4.2% *14* if Iγ=15.3 (1984So18); Iγ=10.2 *6* (1974WrZY).
[x]1192.2 *4*	1.52 *21*							
1243.3 *1*	1.80 *16*	2569.78		1326.48	1^-			
1280.0 *1*	7.3 *4*	1639.60	0^+	359.596	2^+	Q		
1326.46 *7*	47.5 *7*	1326.48	1^-	0.0	0^+			
1333.4 *3*	1.9 *3*	1693.0?	2^+	359.596	2^+	D+Q	−0.94 *29*	I_γ: Iγ=2.0% *3* if Iγ=7.5 (1984So18). δ: δ=−0.09 *10*, if J=2; if J=3, δ=+0.85 *15*.
1421.9 *1*	2.70 *21*	1781.50		359.596	2^+	D+(Q)		
1423.9 *1*	3.80 *20*	1424.06	2^+	0.0	0^+	Q		I_γ: Iγ=1.8% *2* if Iγ=6.8 (1984So18). Mult.,δ: D+Q with −19.3<δ<+11.9.
[x]1559.1 *2*	1.62 *16*							
[x]1610.7 *2*	1.26 *13*							
1768.3 *3*	1.90 *12*	2127.9	0^+	359.596	2^+	Q		
[x]1774.6 *4*								
1818.0 *3*	1.22 *13*	3144.38	(1)	1326.48	1^-			
[x]1899.08[&] *15*	2.90 *23*							
[x]1915.7 *4*	0.59 *12*							
1935.2 *4*	1.26 *14*	3261.7	(1)	1326.48	1^-			
1956.8 *4*	0.93 *16*	3283.29	(1)	1326.48	1^-			
[x]1961.1 *5*	0.41 *16*							
1982.1 *2*	4.4 *3*	2341.77	1	359.596	2^+	D+(Q)	+0.09 *5*	I_γ: from 1974WrZY.
[x]2051.0[&] *7*	0.30 *12*							
[x]2056.1[&] *5*	0.46 *12*							
2246.1 *4*	1.40 *16*	3573.08	(1)	1326.48	1^-			
[x]2254.0 *3*	0.96 *14*							
2341.7 *5*	0.70 *11*	2341.77	1	0.0	0^+			
[x]2351.3[&] *5*	0.47 *10*							
[x]2393.7[&] *2*	0.18 *16*							
2393.7[&] *4*	0.18 *16*	5280.4						
2397.8[&] *4*	2.63 *23*	5280.4		2882.57	$(1,2^+)$			
[x]2415.1 *6*	0.26 *12*							E_γ: 2412.2 *9* in 1974WrZY.
[x]2508.9 *7*	0.39 *13*							
2522.9 *4*	0.90 *14*	2882.57	$(1,2^+)$	359.596	2^+			
[x]2575.9[&] *6*	0.38 *11*							
[x]2613.2[&] *4*	0.72 *11*							

$^{142}_{56}Ba_{86}$-3

^{142}Cs β^- decay 1980Sc16,1974WrZY (continued)

$\gamma(^{142}Ba)$ (continued)

E_γ ‡	I_γ ‡#a	E_i(level)	J_i^π	E_f	J_f^π
x2656.0& 6	0.39 12				
x2677.2& 10	0.23 12				
x2725.77& 24	1.62 13				
x2757.3& 3	1.25 14				
2784.6 5	0.47 11	3144.38	(1)	359.596	2^+
x2796.6& 6	0.32 10				
x2839.6& 8	0.25 10				
2882.5 3	1.36 12	2882.57	$(1,2^+)$	0.0	0^+
2923.5 3	1.71 16	3283.29	(1)	359.596	2^+
2938.6& 5	0.45 10	5280.4		2341.77	1
x2988.6& 7	0.34 12				
x3079.3& 17	0.13 10				
3144.2 5	0.56 12	3144.38	(1)	0.0	0^+
x3167.7& 7	0.40 12				
3261.6 5	0.62 10	3261.7	(1)	0.0	0^+
3283.4 3	2.06 20	3283.29	(1)	0.0	0^+
x3369.2& 10	0.21 9				
x3426.5& 4	0.87 12				
3573.3 3	2.32 17	3573.08	(1)	0.0	0^+
x3661.5& 8	0.30 10				
x3786.3& 4	0.69 10				
x3797.5& 4	0.76 10				
x3835.0& 4	0.93 11				
x3870.5& 5	0.71 12				
x3897.9& 7	0.34 9				
x3931.7& 4	0.94 11				
4009.3 7	0.26 7	4369.3	(1)	359.596	2^+
x4028.3& 5	0.50 7				
x4037.1& 5	0.37 7				
x4085.7& 6	0.32 7				
x4145.7& 11	0.17 8				
x4178.6& 7	0.33 8				
x4198.3& 10	0.18 7				
x4205.5& 7	0.27 7				
x4217.5& 11	0.15 7				
x4238.2& 4	0.78 9				
x4250.6& 8	0.26 7				
x4277.4& 5	0.51 8				
x4362.9& 16	0.10 7				
4369.3 4	1.06 10	4369.3	(1)	0.0	0^+
x4418.2& 4	0.86 9				
x4494.2& 6	0.31 6				
x4537.2& 10	0.13 5				
x4549.6& 8	0.18 5				
x4564.8& 7	0.24 5				
x4578.2& 7	0.23 6				
x4609.8& 7	0.19 5				
x4647.8& 5	0.36 5				
x4670.2& 13	0.07 3				
x4681.8& 9	0.10 3				
x4694.7& 7	0.14 4				
x4730.4& 11	0.059 24				
x4738.4& 11	0.059 24				
x4812.2& 8	0.095 24				
x4862.7& 13	0.062 25				
x4891.1& 8	0.14 3				
x4896.8& 10	0.10 3				
x4937.1& 12	0.047 19				
x4955.5& 14	0.039 18				
x4993.6& 13	0.043 18				
x5006.2& 9	0.078 19				
x5028.2& 12	0.046 19				
x5374.13& 14	0.040 13				

† Additional information 1.
‡ From 1980Sc16.

$^{142}_{56}Ba_{86}$-4

^{142}Cs β^- decay 1980Sc16,1974WrZY (continued)

$\gamma(^{142}Ba)$ (continued)

[#] Absolute Iγ from 1984So18 were renormalized to I(641γ ^{142}La β decay)=47.4% *5* (1981Ge04).
[@] From $\gamma\gamma(\theta)$ (1980Sc16), unless indicated otherwise.
[&] Observed only by 1974WrZY.
[a] For absolute intensity per 100 decays, multiply by 0.272 *27*.
[x] γ ray not placed in level scheme.

$^{142}_{56}Ba_{86}$-5

^{142}Cs β^- decay 1980Sc16,1974WrZY

Decay Scheme

Intensities: Relative I_γ