Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Katakura, Z. D. Wu	NDS 109,1655 (2008)	1-Apr-2008

Q(β^-)=-1.18×10^4 *syst*; S(n)=1.27×10^4 *syst*; S(p)=3.6×10^3 *syst*; Q(α)=1.5×10^3 *syst*   2012Wa38
Note: Current evaluation has used the following Q record −1.169E4 SY1.272E4 SY3.41E3 SY1.64E3 syst   2003Au03.
Uncertainties: 670 for Q(β^-), 420 for S(n) 360 for S(p), 420 for Q(α) (2003Au03).

^{124}Ce Levels

Quasiparticle notations (2004Sm02):
A: $\nu5/2[402]$, $\alpha=+1/2$.
B: $\nu5/2[402]$, $\alpha=-1/2$.
C: $\nu3/2[411]$, $\alpha=+1/2$.
D: $\nu3/2[411]$, $\alpha=-1/2$.
E: $\nu7/2[523]$, $\alpha=-1/2$.
F: $\nu7/2[523]$, $\alpha=+1/2$.
G: $\nu5/2[532]$, $\alpha=-1/2$.
H: $\nu5/2[532]$, $\alpha=+1/2$.
a: $\pi1/2[420]$, $\alpha=+1/2$.
b: $\pi1/2[420]$, $\alpha=-1/2$.
c: $\pi5/2[413]$, $\alpha=-1/2$.
d: $\pi5/2[413]$, $\alpha=+1/2$.
e: $\pi3/2[541]$, $\alpha=-1/2$.
f: $\pi3/2[541]$, $\alpha=+1/2$.
g: $\pi1/2[550]$, $\alpha=-1/2$.
h: $\pi1/2[550]$, $\alpha=+1/2$.

Cross Reference (XREF) Flags

A	^{124}Pr ε decay
B	^{125}Nd εp decay
C	(HI,xnγ)

E(level)[†]	J$^\pi$[&]	$T_{1/2}$	XREF	Comments
0.0[‡]	0$^+$	6 s *2*	ABC	%ε+%β^+=100 $T_{1/2}$: from multiscaling of K x-ray (1978Bo32).
141.90[‡] *20*	2$^+$	0.88 ns *19*	ABC	$T_{1/2}$: from DSA (1995Ma96). 2001Ra27 evaluation gives 0.88 ns *19*.
447.8[‡] *3*	4$^+$	19 ps *6*	BC	$T_{1/2}$: from DSA (1995Ma96). Upper limit because of insufficient correction of long-lived component.
891.9[‡] *4*	6$^+$		C	
1450.7[‡] *4*	8$^+$		C	
1849.8[@] *5*	(7$^-$)		C	
2100.9[‡] *5*	10$^+$		C	
2127.7[@] *5*	(9$^-$)		C	
2183.9[#] *5*	(8$^+$)		C	
2509.9[@] *5*	(11$^-$)		C	
2600.6[#] *5*	(10$^+$)		C	
2818.3[‡] *5*	12$^+$		C	
2984.1[@] *5*	(13$^-$)		C	

Adopted Levels, Gammas (continued)

^{124}Ce Levels (continued)

E(level)[†]	J^{π}[&]	XREF	E(level)[†]	J^{π}[&]	XREF	E(level)[†]	J^{π}[&]	XREF
3072.5[#] 5	(12$^+$)	C	5584.5[#] 6	(20$^+$)	C	8620.7[@] 13	(27$^-$)	C
3544.0[@] 6	(15$^-$)	C	5724.2[@] 7	(21$^-$)	C	8947.2[‡] 16	(26$^+$)	C
3544.6[‡] 5	14$^+$	C	5848.2[‡] 7	20$^+$	C	9334.7[#] 19	(28$^+$)	C
3592.8[#] 5	(14$^+$)	C	6402.7[#] 7	(22$^+$)	C	9733.7[@] 16	(29$^-$)	C
4182.9[#] 6	(16$^+$)	C	6611.2[@] 7	(23$^-$)	C	10177.2[‡] 19	(28$^+$)	C
4189.3[@] 6	(17$^-$)	C	6788.2[‡] 7	(22$^+$)	C	10483.7?[#] 21	(30$^+$)	C
4239.2[‡] 6	16$^+$	C	7304.7[#] 12	(24$^+$)	C	10921.7?[@] 19	(31$^-$)	C
4846.2[#] 6	(18$^+$)	C	7577.6[@] 7	(25$^-$)	C	11502.2?[‡] 21	(30$^+$)	C
4916.7[@] 6	(19$^-$)	C	7818.2[‡] 12	(24$^+$)	C	11734.7?[#] 24	(32$^+$)	C
4997.6[‡] 6	18$^+$	C	8284.7[#] 16	(26$^+$)	C			

  [†] From least-squares fit to Eγ's (by compilers).

  [‡] Band(A): g.s. band. Quasiparticle vacuum at low spins; possible EF neutron alignment at higher spins.

  [#] Band(B): K^{π}=2$^+$; πfg (?). At higher spins possible alignment of νEF and/or πeh.

  [@] Band(C): K^{π}=3$^-$; π3/2[541]$\otimes\pi$3/2[422]. At higher spins possible alignment of νEF and/or πfg.

  [&] These are those reported by 2004Sm02 and based on the listed γ multipolarities and the usual considerations of band structure.

$\gamma(^{124}$Ce)

E_i(level)	J^{π}_i	E_{γ}	I_{γ}	E_f	J^{π}_f	Mult.[†]
141.90	2$^+$	141.9 2	100	0.0	0$^+$	E2
447.8	4$^+$	305.9 2	100	141.90	2$^+$	E2
891.9	6$^+$	444.1 2	100	447.8	4$^+$	Q
1450.7	8$^+$	558.9 2	100	891.9	6$^+$	Q
1849.8	(7$^-$)	956 1	100	891.9	6$^+$	
2100.9	10$^+$	649.6[‡] 2	100	1450.7	8$^+$	Q
2127.7	(9$^-$)	277.8 2	33 10	1849.8	(7$^-$)	
		677.4 2	100 5	1450.7	8$^+$	D
2183.9	(8$^+$)	1291 1	100	891.9	6$^+$	
2509.9	(11$^-$)	382.5 2	100 4	2127.7	(9$^-$)	Q
		408.7 2	42 3	2100.9	10$^+$	D
2600.6	(10$^+$)	416.6 2	100 25	2183.9	(8$^+$)	
		1150.3 2	6.8 5	1450.7	8$^+$	Q
2818.3	12$^+$	717.4 2	100	2100.9	10$^+$	Q
2984.1	(13$^-$)	474.2 2	100	2509.9	(11$^-$)	Q
3072.5	(12$^+$)	472.3 2	100 25	2600.6	(10$^+$)	Q
		971.2 2	88 8	2100.9	10$^+$	Q
3544.0	(15$^-$)	559.9 2	100	2984.1	(13$^-$)	Q
3544.6	14$^+$	726.3 2	100	2818.3	12$^+$	Q
3592.8	(14$^+$)	520.3 2	100	3072.5	(12$^+$)	
4182.9	(16$^+$)	590.1 2	100	3592.8	(14$^+$)	Q
4189.3	(17$^-$)	645.3 2	100	3544.0	(15$^-$)	Q
4239.2	16$^+$	694.6 2	100	3544.6	14$^+$	Q
4846.2	(18$^+$)	663.3 2	100	4182.9	(16$^+$)	Q
4916.7	(19$^-$)	727.4 2	100	4189.3	(17$^-$)	Q
4997.6	18$^+$	758.3 2	100	4239.2	16$^+$	Q
5584.5	(20$^+$)	738.3 2	100	4846.2	(18$^+$)	Q
5724.2	(21$^-$)	807.5 2	100	4916.7	(19$^-$)	
5848.2	20$^+$	850.6 2	100	4997.6	18$^+$	Q
6402.7	(22$^+$)	818.2 2	100	5584.5	(20$^+$)	

Adopted Levels, Gammas (continued)

$\gamma(^{124}\text{Ce})$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
6611.2	(23^-)	887.0 *2*	100	5724.2	(21^-)	9334.7	(28^+)	1050 *1*	100	8284.7	(26^+)
6788.2	(22^+)	940.0 *2*	100	5848.2	20^+	9733.7	(29^-)	1113 *1*	100	8620.7	(27^-)
7304.7	(24^+)	902 *1*	100	6402.7	(22^+)	10177.2	(28^+)	1230 *1*	100	8947.2	(26^+)
7577.6	(25^-)	966.4 *2*	100	6611.2	(23^-)	10483.7?	(30^+)	1149 *1*	100	9334.7	(28^+)
7818.2	(24^+)	1030 *1*	100	6788.2	(22^+)	10921.7?	(31^-)	1188 *1*	100	9733.7	(29^-)
8284.7	(26^+)	980 *1*	100	7304.7	(24^+)	11502.2?	(30^+)	1325 *1*	100	10177.2	(28^+)
8620.7	(27^-)	1043 *1*	100	7577.6	(25^-)	11734.7?	(32^+)	1251 *1*	100	10483.7?	(30^+)
8947.2	(26^+)	1129 *1*	100	7818.2	(24^+)						

[†] These are those reported by 2004Sm02. These are based on DCO data and band structure considerations. When the life time is given, DCO and RUL are used.

[‡] Level-energy difference=650.3.

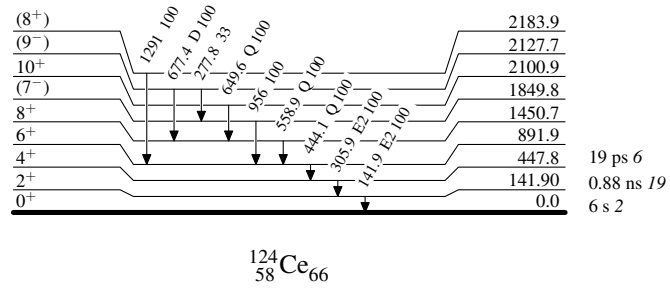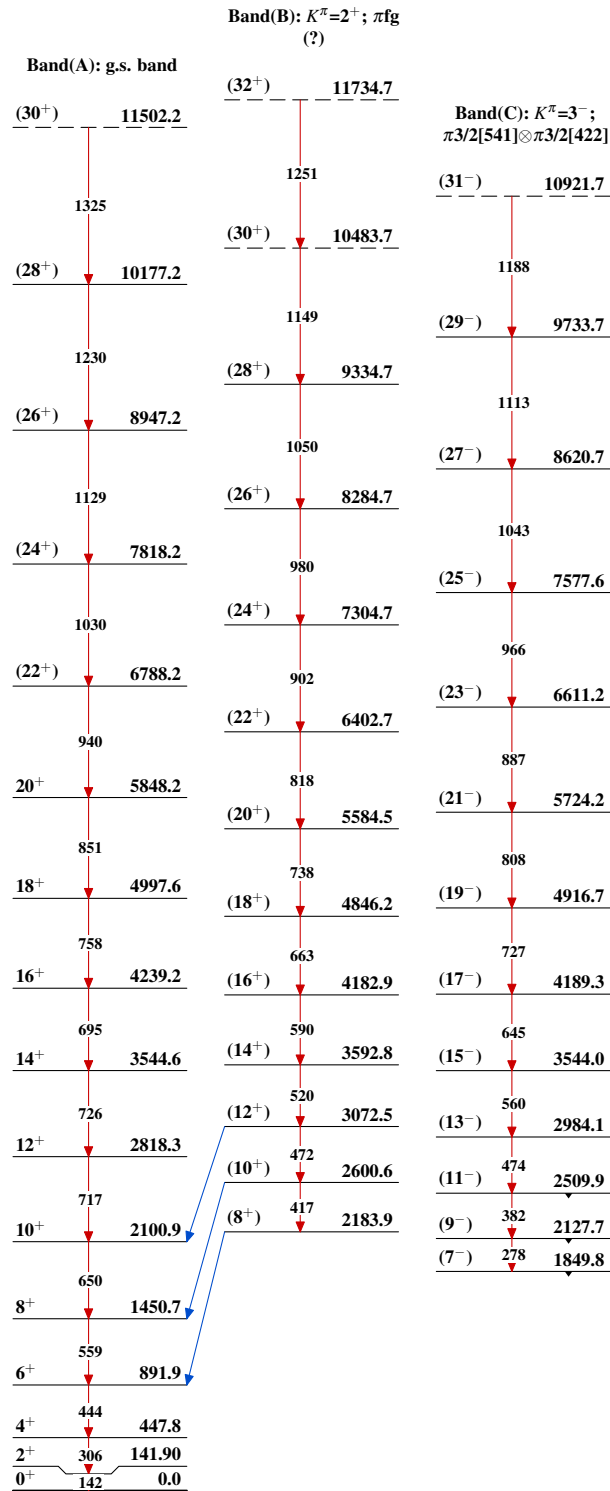**Adopted Levels, Gammas**

Level Scheme

Intensities: Relative photon branching from each level
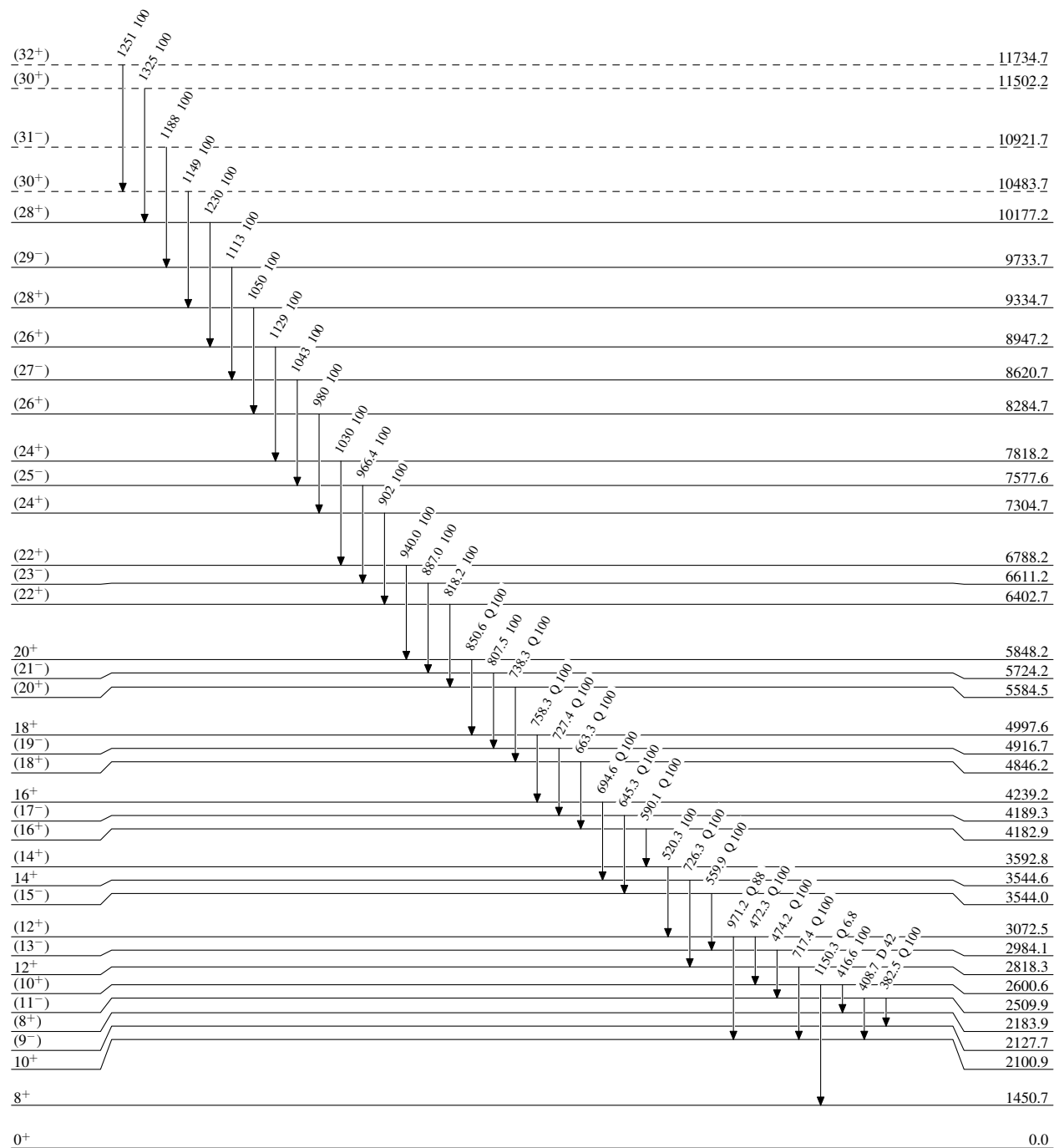
$^{124}_{58}$Ce$_{66}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

$^{124}_{58}$Ce$_{66}$

Adopted Levels, Gammas

Band(B): $K^\pi = 2^+$; πfg (?)

Band(A): g.s. band

Band(C): $K^\pi = 3^-$; $\pi 3/2[541] \otimes \pi 3/2[422]$

Band(A)		Band(B)		Band(C)	
(30$^+$)	11502.2	(32$^+$)	11734.7		
				(31$^-$)	10921.7
	1325	1251			
(28$^+$)	10177.2	(30$^+$)	10483.7		1188
				(29$^-$)	9733.7
	1230	1149			
(26$^+$)	8947.2	(28$^+$)	9334.7		1113
				(27$^-$)	8620.7
	1129	1050			
(24$^+$)	7818.2	(26$^+$)	8284.7		1043
				(25$^-$)	7577.6
	1030	980			
(22$^+$)	6788.2	(24$^+$)	7304.7		966
				(23$^-$)	6611.2
	940	902			
20$^+$	5848.2	(22$^+$)	6402.7		887
				(21$^-$)	5724.2
	851	818			
18$^+$	4997.6	(20$^+$)	5584.5		808
				(19$^-$)	4916.7
	758	738			
16$^+$	4239.2	(18$^+$)	4846.2		727
				(17$^-$)	4189.3
	695	663			
14$^+$	3544.6	(16$^+$)	4182.9		645
				(15$^-$)	3544.0
	726	590			
12$^+$	2818.3	(14$^+$)	3592.8		560
				(13$^-$)	2984.1
	717	520			
10$^+$	2100.9	(12$^+$)	3072.5		474
				(11$^-$)	2509.9
	650	472			
8$^+$	1450.7	(10$^+$)	2600.6		382
				(9$^-$)	2127.7
	559	417			
6$^+$	891.9	(8$^+$)	2183.9	278	
				(7$^-$)	1849.8
	444				
4$^+$	447.8				
2$^+$	141.90	306			
0$^+$	0.0	142			

$^{124}_{58}$Ce$_{66}$