^{129}In β^- decay (1.23 s) 2004Ga24,1980De35

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Janos Timar and Zoltan Elekes, Balraj Singh	NDS 121, 143 (2014)	31-May-2014

Parent: ^{129}In: E=459 *5*; J^π=(1/2$^-$); $T_{1/2}$=1.23 s *3*; Q(β^-)=7769 *19*; %β^- decay=100.0

^{129}In-E,J^π,$T_{1/2}$: From ^{129}In Adopted Levels.

^{129}In-Q(β^-): From 2012Wa38.

1980De35: ^{235}U(n,F) E=th, on-line ms; semi, scin β, γ, ce, $\gamma\gamma$-, $\beta\gamma$-coin.

1987Sp09: ^{235}U(n,F) E=th, on-line ms; HPGE, β, γ, $\beta\gamma$-coin.

2004Ga24: The ^{129}In isotope was obtained by thermal-neutron induced fission of a ^{235}U carbide target inside the combined target and ion source ANUBIS. During the measurements of singles data, surface ionization was used to select the element In and thereby suppress the daughter activities. Measured Eβ, Eγ, Iγ, $\gamma\gamma$, $\beta\gamma$(coin), $\gamma\gamma$(t), $T_{1/2}$ (isotope) with 3 Ge detectors of which one was a LEPS. Three Ge detectors were also used for the Q_β measurement, where the LEPS detector was used as a β spectrometer.

^{129}Sn Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	3/2$^+$	2.23 min *4*	$T_{1/2}$: from 1980De35.
35.35 *13*	11/2$^-$	6.9 min *1*	%β^-=100 $T_{1/2}$: from 1980De35. %β^-: γ transition not expected from RUL and not observed in experiments.
315.410 *20*	(1/2)$^+$		
763.89 *13*	(9/2$^-$)		
769.28 *9*	(5/2$^+$)		
1043.89 *13*	(7/2$^-$)		
1047.45 *7*	(7/2$^+$)		
1222.61 *5*	(3/2$^+$)		
1288.74 *9*	(3/2$^+$)		
1613.51 *15*			
1701.28 *13*	(7/2$^-$)		
3079.4 *3*	(3/2$^-$)		
3394.3 *3*	(1/2,3/2)		
3590.62 *9*	(3/2$^-$)		

[†] Based on a least-squares fit to the Eγ data from 2004Ga24; level scheme is also from 2004Ga24.

[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(4637 *20*)	3590.62	5.10 *17*	5.54 *2*	av Eβ=2016.8 *93*
(4834 *20*)	3394.3	0.22 *2*	6.98 *5*	av Eβ=2109.8 *94*
(5149 *20*)	3079.4	0.42 *3*	6.82 *4*	av Eβ=2259.1 *94*
(6939 *20*)	1288.74	0.58 *7*	7.26 *6*	av Eβ=3108.2 *93*
(7005 *20*)	1222.61	1.56 *14*	6.85 *4*	av Eβ=3139.5 *93*
(7913 *20*)	315.410	15.1 *13*	6.10 *4*	av Eβ=3568.8 *93*
(8228 *20*)	0.0	77 *15*	5.47 *9*	av Eβ=3717.9 *93*

[†] From 2004Ga24.

[‡] Absolute intensity per 100 decays.

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$\gamma(^{129}Sn)$

Iγ normalization: From 2004Ga24. %IT<0.3; %β^-n=3.92 *19* (1993Ru01).

E_γ[†][‡]	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
175.13 *12*	0.17 *10*	1222.61	(3/2$^+$)	1047.45	(7/2$^+$)			
278.18 *9*	0.07 *3*	1047.45	(7/2$^+$)	769.28	(5/2$^+$)			
279.93 *11*	0.45 *9*	1043.89	(7/2$^-$)	763.89	(9/2$^-$)			
315.42 *2*	100 *7*	315.410	(1/2)$^+$	0.0	3/2$^+$	E2(+M1)	0.027 *3*	α(K)exp=0.025 *2* (1980De35) α(K)=0.0230 *24*; α(L)=0.0031 *8*; α(M)=0.00060 *16* α(N)=0.00011 *3*; α(O)=9.1×10^{-6} *9* Mult.: α(K)exp gives δ(E2/M1)>0.7; K/L=6.9 *17* (1980De35) is consistent with E2 or M1.
519.5 *6*	1.0 *2*	1288.74	(3/2$^+$)	769.28	(5/2$^+$)			
657.7 *3*	0.61 *6*	1701.28	(7/2$^-$)	1043.89	(7/2$^-$)			
728.53 *3*	1.23 *13*	763.89	(9/2$^-$)	35.35	11/2$^-$			
769.31 *18*	1.9 *2*	769.28	(5/2$^+$)	0.0	3/2$^+$			
907.34 *8*	5.7 *4*	1222.61	(3/2$^+$)	315.410	(1/2)$^+$			
931.96 *19*	0.82 *9*	1701.28	(7/2$^-$)	769.28	(5/2$^+$)			
937.54 *19*	0.78 *9*	1701.28	(7/2$^-$)	763.89	(9/2$^-$)			
973.5 *2*	2.2 *2*	1288.74	(3/2$^+$)	315.410	(1/2)$^+$			
1008.53 *3*	10.6 *8*	1043.89	(7/2$^-$)	35.35	11/2$^-$			
1047.41 *10*	0.10 *3*	1047.45	(7/2$^+$)	0.0	3/2$^+$			
1222.51 *8*	7.7 *5*	1222.61	(3/2$^+$)	0.0	3/2$^+$			
1288.64 *11*	2.8 *2*	1288.74	(3/2$^+$)	0.0	3/2$^+$			
1613.4 *2*	2.0 *3*	1613.51		0.0	3/2$^+$			
1889.6 *2*	2.2 *2*	3590.62	(3/2$^-$)	1701.28	(7/2$^-$)			
1977.0 *2*	1.98 *16*	3590.62	(3/2$^-$)	1613.51				
2035.5 *6*	1.11 *11*	3079.4	(3/2$^-$)	1043.89	(7/2$^-$)			
2301.7 *2*	2.8 *2*	3590.62	(3/2$^-$)	1288.74	(3/2$^+$)			
2368.15 *17*	4.8 *4*	3590.62	(3/2$^-$)	1222.61	(3/2$^+$)			
2546.61 *11*	9.4 *7*	3590.62	(3/2$^-$)	1043.89	(7/2$^-$)			
2763.9 *4*	1.23 *10*	3079.4	(3/2$^-$)	315.410	(1/2)$^+$			
3078.9 *3*	1.24 *10*	3394.3	(1/2,3/2)	315.410	(1/2)$^+$			
3275.16 *15*	5.9 *4*	3590.62	(3/2$^-$)	315.410	(1/2)$^+$			
3590.8 *4*	1.18 *10*	3590.62	(3/2$^-$)	0.0	3/2$^+$			

[†] From 2004Ga24.
[‡] As for unplaced γ rays, see comments under ^{129}In β^- decay (0.61 s).
[#] Value overlaps M1 and E2, when δ not given.
[@] For absolute intensity per 100 decays, multiply by 0.18.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays