^{129}In β^- decay (0.67 s) 2004Ga24

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=1630 *56*; J^π=(23/2$^-$); $T_{1/2}$=0.67 s *10*; Q(β^-)=7769 *19*; %β^- decay=100.0

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

^{129}In-Q(β^-): From 2012Wa38.

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[#]	$T_{1/2}$[#]
0.0	3/2$^+$	2.23 min *4*
35.5 *1*	11/2$^-$	6.9 min *1*
1171.82[‡] *4*	(15/2$^-$)	
1359.75[‡] *4*	(13/2$^-$)	
1742.24 *4*	(15/2$^+$)	
1762.0 *10*	(19/2$^+$)	3.2 μs *2*
1803.0 *11*	(23/2$^+$)	2.0 μs *2*
2276.9 *11*	(21/2)	
3992.9 *11*	(21/2$^-$)	

[†] From least-squares fit to Eγ data.

[‡] 2004Ga24 notes that an imbalance of the γ-ray intensities for transitions feeding and depopulating this level has been observed. The authors indicate that unobserved γ feeding is most likely the cause of the apparent β feeding and that true β feeding is assumed to be zero for this level.

[#] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†#]	Log *ft*	Comments
(5.41×10^3 *6*)	3992.9	75 *4*	4.4 *1*	av Eβ=2381 *28*
(7.12×10^3 *6*)	2276.9	8.0 *12*	5.9 *1*	av Eβ=3195 *28*
(7.60×10^3 *6*)	1803.0	14[‡] *4*	5.8 *2*	av Eβ=3419 *28*

[†] From 2004Ga24.

[‡] Total feeding for 1762 and 1803 levels; but most of this feeding is expected to be for 1803 level. The feeding for the 1762 level is expected to be much weaker in view of first- forbidden unique transition involved.

[#] Absolute intensity per 100 decays.

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$\gamma(^{129}Sn)$

Iγ normalization: From 2004Ga24.

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[#]	$I_{(\gamma+ce)}$[‡]	Comments
19.7 *10*		1762.0	(19/2$^+$)	1742.24	(15/2$^+$)	(E2)		168	$I_{(\gamma+ce)}$: from the level scheme by 2004Ga24.
41.0 *2*	2.5 *8*	1803.0	(23/2$^+$)	1762.0	(19/2$^+$)	(E2)	39.9 *10*		α(K)=13.64 *23*; α(L)=21.1 *6*; α(M)=4.37 *12* α(N)=0.756 *21*; α(O)=0.0195 *5*
382.49 *2*	72 *5*	1742.24	(15/2$^+$)	1359.75	(13/2$^-$)				
473.99 *16*	21.3 *16*	2276.9	(21/2)	1803.0	(23/2$^+$)				
515.1 *6*	6.3 *7*	2276.9	(21/2)	1762.0	(19/2$^+$)				
570.41 *3*	92 *7*	1742.24	(15/2$^+$)	1171.82	(15/2$^-$)				
1136.31 *5*	100 *7*	1171.82	(15/2$^-$)	35.5	11/2$^-$				
1324.25 *5*	74 *5*	1359.75	(13/2$^-$)	35.5	11/2$^-$				
1716.1 *3*	13.6 *12*	3992.9	(21/2$^-$)	2276.9	(21/2)				
2189.92 *10*	83 *6*	3992.9	(21/2$^-$)	1803.0	(23/2$^+$)				
2230.88 *18*	34 *2*	3992.9	(21/2$^-$)	1762.0	(19/2$^+$)				

[†] From Adopted Gammas.

[‡] For absolute intensity per 100 decays, multiply by 0.58.

[#] 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.

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Decay Scheme

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