

^{82}As β^- decay (13.6 s) 2004Ga44

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne		NDS 157, 260 (2019)	1-Mar-2019

Parent: ^{82}As : $E=131.6$ 3; $J^\pi=(5^-)$; $T_{1/2}=13.6$ s 4; $Q(\beta^-)=7489$ 4; $\% \beta^-$ decay=100.0

^{82}As -E, $T_{1/2}$, J^π : From Adopted Levels.

^{82}As - $Q(\beta^-)$: from 2017Wa10.

Based on XUNDL dataset from 2004Ga44 Compiled by J. Roediger and B. Singh (McMaster), September 10, 2004.

Isotopes of ^{82}As were produced via neutron-induced fission of a ^{235}U target. The desired isotope was then ionized by plasma ionization and mass separated before being collected on mylar tape in front of the detector system. Tape movements were used in order to minimize contributions from possible contaminations by long lived nuclides. In a second experiment of the same reaction, γ -ray multi-spectrum scaling was performed where tape movements were followed by seven groups of data taken with the beam deflected.

Measured E_γ , I_γ , $\gamma\gamma$, $I\beta$, $\beta\gamma$ (coin) using standard coaxial HPGe detectors, while a Low Energy Photon Ge detector (LEP) was used as a β detector.

Decay scheme is in general agreement with earlier work of 1975Kr08: $^{82}\text{Se}(n,p)$, fission product, chemical separation. Measured E_γ , I_γ , $\gamma\gamma$; Ge(Li).

Others:

1970Va31: $^{82}\text{Se}(n,p)$. Measured $E\beta$, $I\beta$, E_γ , I_γ , $\beta\gamma$, $\gamma\gamma$; Ge(Li) FWHM=3.5 keV at 1.33 MeV, Si(Li), NaI(Tl), and plastic scin.

1970Ka04: $^{82}\text{Se}(n,p)$. Measured E_γ , I_γ , $E\beta$, $\gamma\gamma$, $\beta\gamma$. Measured $T_{1/2}(^{82}\text{As})=13.7$ s 8 from $342\gamma(t)$. In all experiments both ^{82}As isotopes are produced. The γ 's of the two decays are separated by 1975Kr08 by comparing the relative intensities of sources produced by (n,p) and by fission. Intensities are quoted as shown in the drawing of 1975Kr08.

 ^{82}Se Levels

E(level) [†]	J^π	Comments
0.0	0 ⁺	
654.39 16	2 ⁺	
1730.03 16	2 ⁺	
1733.85 21	4 ⁺	
2548.40 19	(3,4 ⁺)	J^π : 3 is less likely if $J^\pi(\text{parent})=5^-$.
2891.78 24	5 ⁻	
3452.3 3	(5 ⁻)	
4088.0 4	(4 ⁻ ,5 ⁻)	

[†] From least-squares fit to E_γ 's.

 β^- radiations

E(decay)	E(level)	$I\beta^-$ [†]	Log ft	Comments
(3533 4)	4088.0	7.4 10	5.67 6	av $E\beta=1530.0$ 20 E(decay): 3566 35 from $\beta(1539.6\gamma)$ coin.
(4168 4)	3452.3	14.4 18	5.70 6	av $E\beta=1835.7$ 20 E(decay): 4231 19 from $\beta(560.5\gamma)$ coin.
(4729 4)	2891.78	54 7	5.37 6	av $E\beta=2106.2$ 20 E(decay): $E\beta=3600$ 200 from $\beta\gamma$ (1970Ka04).
(5072 4)	2548.40	20 5	5.93 11	av $E\beta=2272.3$ 20
(5887 [‡] 4)	1733.85	5 5	6.8 5	av $E\beta=2666.7$ 20
(5891 [‡] 4)	1730.03	<3	>7.1	av $E\beta=2668.6$ 20

[†] Absolute intensity per 100 decays.

[‡] Existence of this branch is questionable.

^{82}As β^- decay (13.6 s) 2004Ga44 (continued) $\gamma(^{82}\text{Se})$

I γ normalization: From 2004Ga44, based on $\Sigma(\gamma+ce)$ to g.s.=100 with no direct feeding to the g.s..

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π
343.7 2	87 4	2891.78	5 ⁻	2548.40	(3,4 ⁺)	1079.3 2	26 7	1733.85	4 ⁺	654.39	2 ⁺
560.5 2	19.2 11	3452.3	(5 ⁻)	2891.78	5 ⁻	1157.6 2	4.6 5	2891.78	5 ⁻	1733.85	4 ⁺
654.4 2	100 5	654.39	2 ⁺	0.0	0 ⁺	1539.6 3	9.8 8	4088.0	(4 ⁻ ,5 ⁻)	2548.40	(3,4 ⁺)
814.7 2	15.0 9	2548.40	(3,4 ⁺)	1733.85	4 ⁺	1730.0 2	34 3	1730.03	2 ⁺	0.0	0 ⁺
818.3 2	46 2	2548.40	(3,4 ⁺)	1730.03	2 ⁺	1894.2 2	62 3	2548.40	(3,4 ⁺)	654.39	2 ⁺
1075.6 2	12.0 12	1730.03	2 ⁺	654.39	2 ⁺						

† For absolute intensity per 100 decays, multiply by 0.75 8.

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Decay Scheme

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

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$

