^{86}As β^- decay (0.945 s)   2015Ma51,2015Ma25

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Jan-2016

Parent: ^{86}As: E=0.0; T$_{1/2}$=0.945 s 8; Q(β^-)=11541 4; %β^- decay=100.0

^{86}As-J$^\pi$: (1$^-$,2$^-$) from 1/2$^-$ proton and 3/2$^+$ neutron orbitals in theoretical calculations (1997Mo25).

^{86}As-T$_{1/2}$: From ^{86}As Adopted Levels.

^{86}As-Q(β^-): From 2012Wa38.

2015Ma51: ^{86}As beam produced in the neutron-induced fission of ^{235}U using recoil mass separator Lohengrin at the Institut Laue-Langevin (ILL). Measured Eγ, Iγ, $\gamma\gamma$-coin, $\beta\gamma$-coin, $\gamma\gamma(\theta)$ using a EUROBALL cluster detector with seven HPGe crystals, and three plastic scintillators for β detection. Comparison with shell-model calculations.

2015Ma25, 2013Ma22: ^{86}As obtained by the decay of ^{87}Ge produced by a proton beam on a ^{238}UC$_x$ target at the HRIBF-ORNL facility. Measured Eγ, Iγ, Eβ, $\beta\gamma\gamma$-coin, half-lives using two plastic scintillation counters at the implantation point and four HPGe Clover detectors in close geometry. Two gamma rays at 704 and 694 keV reported in 2013Ma22, the latter was unassigned in level scheme. In a conference article, 2015Ma25 report 13 gamma rays placed among 11 excited states in ^{86}Se, four of which are marked in the level scheme as tentative. Results from 2015Ma25 are listed as preliminary.

1975Kr08: measured Eγ, T$_{1/2}$, 704γ from first 2$^+$ reported.

^{86}As β^-n measurements: 2014Ag12, 1993Ru01, 1978Cr03, 1973Kr06 (also 1974KrZG).

^{86}Se Levels

E(level)[‡]	J$^\pi$[†]	T$_{1/2}$	Comments
0.0	0$^+$	14.3 s 3	T$_{1/2}$: From ^{86}Se Adopted Levels.
704.31 5	2$^+$		
1317.8?			E(level): tentative level from 2015Ma25 only; not included in the Adopted dataset.
1398.95 7	(2$^+$)		J=1 is not likely from R$_{ang}$ for 694.65γ (2015Ma51).
1543.6 3			E(level): level from 2015Ma25 only; not included in the Adopted dataset.
1567.72 12	4$^+$		
2072.72 15	(4$^+$)		J$^\pi$: 2015Ma51 assign (4$^+$,5), but favor 4$^+$ from γ to (2$^+$).
2180.65 11	(2,3,4$^+$)		J$^\pi$: (3,4$^+$) in 2015Ma51.
2208.32 11	(2$^+$)		J$^\pi$: (2,3) in 2015Ma51.
2372.28 9	(2,3,4$^+$)		J$^\pi$: (3,4) in 2015Ma51.
2648.1? 5			E(level): tentative level from 2015Ma25 only; not included in the Adopted dataset.
3729.7? 5			E(level): tentative level from 2015Ma25 only; not included in the Adopted dataset.
4236.96 14	(2,3,4$^+$)		J$^\pi$: no assignment in 2015Ma51.
4783.22 21	(2,3,4$^+$)		J$^\pi$: no assignment in 2015Ma51.

[†] From Adopted Levels.

[‡] From least-squares fit (by evaluator) to Eγ data.

β^- radiations

Due to an incomplete decay scheme, deduction of log ft values from listed (apparent) β feedings is not meaningful.

E(decay)	E(level)	Iβ^-[†‡]
(6758 4)	4783.22	0.66 22
(7304 4)	4236.96	1.9 3
(9169 4)	2372.28	2.6 3
(9333 4)	2208.32	1.6 2
(9360 4)	2180.65	1.1 3
(9468 4)	2072.72	0.8 3
(9973 4)	1567.72	1.5 3

^{86}As β^- decay (0.945 s)   2015Ma51,2015Ma25 (continued)

β^- radiations (continued)

E(decay)	E(level)	I$\beta^{-\dagger\ddagger}$
(10142 *4*)	1398.95	6.4 *9*
(10837 *4*)	704.31	8.1 *11*

† Apparent feedings deduced from γ-intensity balance since the decay scheme is incomplete. These should be treated as upper limits of β feedings, as there are likely to be many unobserved transitions from higher levels.

‡ Absolute intensity per 100 decays.

$\gamma(^{86}$Se)

Iγ normalization: Value deduced by 2015Ma51, assuming %β^-n=35.5 *6* for ^{86}As decay as given in Adopted Levels of ^{86}As from 2014Ag12 measurement.

R_{ang}=I$\gamma(0°)$/I$\gamma(90°)$ in a spectrum gated on 704.3-keV, ΔJ=2, quadrupole (E2) transition.

E$_\gamma^\dagger$	I$_\gamma^{\dagger@}$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.$^{\#}$	Comments
505.0 *1*	3 *1*	2072.72	(4$^+$)	1567.72	4$^+$		E$_\gamma$: 505.1 (2015Ma25).
613.5$^{\&}$		1317.8?		704.31	2$^+$		E$_\gamma$: tentative γ from 2015Ma25 only; not included in the Adopted dataset.
674.2$^{\&}$ *3*	0.5 *3*	2072.72	(4$^+$)	1398.95	(2$^+$)		
694.65‡ *5*	24 *2*	1398.95	(2$^+$)	704.31	2$^+$		R_{ang}=1.01 *3*. E$_\gamma$: 694.5 *3* (2015Ma25).
704.30‡ *5*	100 *4*	704.31	2$^+$	0.0	0$^+$	E2	E$_\gamma$: 704.1 (2015Ma25).
782.2 *2*	0.9 *3*	2180.65	(2,3,4$^+$)	1398.95	(2$^+$)		
839.3 *3*		1543.6		704.31	2$^+$		E$_\gamma$: γ from 2015Ma25 only; not included in the Adopted dataset.
863.4 *1*	10 *1*	1567.72	4$^+$	704.31	2$^+$	E2	E$_\gamma$: 863.3 (2015Ma25). R_{ang}=1.14 *5*.
973.3 *1*	2.1 *7*	2372.28	(2,3,4$^+$)	1398.95	(2$^+$)		E$_\gamma$: 973.2 *5* (2015Ma25).
1399.1 *2*	11 *2*	1398.95	(2$^+$)	0.0	0$^+$		E$_\gamma$: 1399.3 *5* (2015Ma25).
1476.2 *1*	4 *1*	2180.65	(2,3,4$^+$)	704.31	2$^+$		
1504.0 *1*	8 *1*	2208.32	(2$^+$)	704.31	2$^+$		E$_\gamma$: 1504.0 *3* (2015Ma25). R_{ang}=0.94 *6*.
1668.0 *1*	11 *1*	2372.28	(2,3,4$^+$)	704.31	2$^+$		E$_\gamma$: 1667.9 *5* (2015Ma25). R_{ang}=1.17 *7*.
1864.8 *2*	1.5 *5*	4236.96	(2,3,4$^+$)	2372.28	(2,3,4$^+$)		
1943.8$^{\&}$ *5*		2648.1?		704.31	2$^+$		E$_\gamma$: tentative γ from 2015Ma25 only; not included in the Adopted dataset.
2028.7 *3*	1.0 *5*	4236.96	(2,3,4$^+$)	2208.32	(2$^+$)		
2208 *1*	0.3 *2*	2208.32	(2$^+$)	0.0	0$^+$		
3025.4$^{\&}$ *5*		3729.7?		704.31	2$^+$		E$_\gamma$: tentative γ from 2015Ma25 only; not included in the Adopted dataset.
3384.2 *2*	3 *1*	4783.22	(2,3,4$^+$)	1398.95	(2$^+$)		
3532.4 *2*	6 *1*	4236.96	(2,3,4$^+$)	704.31	2$^+$		E$_\gamma$: 3531.9 *5* (2015Ma25).

† From 2015Ma51 unless otherwise stated.

‡ γ rays with energies of 694 and 704 keV known from earlier literature, and 704 placed from first (2$^+$).

$^{\#}$ From Adopted Gammas.

$^@$ For absolute intensity per 100 decays, multiply by 0.22 *5*.

$^{\&}$ Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: Relative I_γ

Legend

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

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

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

γ Decay (Uncertain)

● Coincidence