

^{242}U β^- decay 1979Ha26

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin, C. D. Nesaraja		NDS 186, 261 (2022)	31-Dec-2021

Parent: ^{242}U ; $E=0.0$; $J^\pi=0^+$; $T_{1/2}=16.8$ min 5; $Q(\beta^-)=1200$ SY; $\% \beta^-$ decay=100.0

^{242}U - $Q(\beta^-)$: 1200 280 (2021Wa16).

The level scheme is given as constructed by 1979Ha26 from E_γ and I_γ considerations only. Coincidence data were not taken because of insufficient source intensity. Since conversion electron data were not taken, low-energy highly converted transitions, if any, would not have been seen. The level scheme is tentative.

 ^{242}Np Levels

E(level)	J^π^\dagger	$T_{1/2}$
0.0	(1 ⁺)	2.2 min 2
55.58 6	(1 ⁻ ,0 ⁻)	
67.60 5	(1 ⁻ ,0 ⁻)	
293.83 8		
329.72 9	(1,0)	
598.26 15	(1,0)	
640.54 8	(1 ⁺ ,0 ⁺)	

[†] From Adopted Levels.

 β^- radiations

$I\beta^-$'s are deduced from intensity balance at each level. Because of the possibility of missing highly converted transitions and because of the tentative nature of the decay scheme, the β^- transitions and their intensities are also tentative.

E(decay)	E(level)	$I\beta^-^\dagger$	Log ft	Comments
(559 SY)	640.54	3.6 11	6.0 10	av $E\beta=166$ 97
(601 SY)	598.26	0.53 21	6.9 9	av $E\beta=180$ 98
(870 SY)	329.72	0.8 3	7.3 6	av $E\beta=2.7 \times 10^2$ 11
(906 SY)	293.83	<0.5	>7.5	av $E\beta=2.9 \times 10^2$ 11
(1132 SY)	67.60	10 4	6.6 5	av $E\beta=3.7 \times 10^2$ 11
(1144 SY)	55.58	3.8 12	7.0 5	av $E\beta=3.7 \times 10^2$ 11
(1200 SY)	0.0	81 6	5.7 4	av $E\beta=4.0 \times 10^2$ 11

$I\beta^-$: From $100 - \sum(I(\gamma+ce))$ to the g.s.).

Existence of this branch is deduced by 1979Ha26 from the fact that the sum of the absolute γ intensities amounts to about 30% of the total energy.

Log ft of 5.7 is consistent with a β^- transition from the $\nu 7/2[624]$ to the $\pi 5/2[642]$ Nilsson state.

[†] Absolute intensity per 100 decays.

 $\gamma(^{242}\text{Np})$

I_γ normalization: the absolute γ intensities were obtained by normalizing the relative I_γ 's to $I(735.9\gamma)=4.9$ 15 per 100 β^- decays of 2.2-min ^{242}Np . The ^{242}U source was in equilibrium with ^{242}Np ,

Continued on next page (footnotes at end of table)

$^{242}\text{U} \beta^-$ decay **1979Ha26** (continued) $\gamma(^{242}\text{Np})$ (continued)

E_γ [‡]	I_γ ^{#&}	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [@]	α [†]	Comments
55.58 6	75 3	55.58	(1 ⁻ ,0 ⁻)	0.0	(1 ⁺)	E1	0.601 9	$\alpha(\text{L})=0.451$ 6; $\alpha(\text{M})=0.1120$ 16 $\alpha(\text{N})=0.0298$ 4; $\alpha(\text{O})=0.00690$ 10; $\alpha(\text{P})=0.001126$ 16; $\alpha(\text{Q})=4.16 \times 10^{-5}$ 6
67.60 5	184 5	67.60	(1 ⁻ ,0 ⁻)	0.0	(1 ⁺)	E1	0.359 5	$\alpha(\text{L})=0.269$ 4; $\alpha(\text{M})=0.0666$ 9 $\alpha(\text{N})=0.01774$ 25; $\alpha(\text{O})=0.00414$ 6; $\alpha(\text{P})=0.000692$ 10; $\alpha(\text{Q})=2.76 \times 10^{-5}$ 4
^x 160.4 1	15 4							
^x 182.0 1	14 1							
^x 220.4 3	3 1							
226.3 1	2 1	293.83		67.60	(1 ⁻ ,0 ⁻)			
238.2 1	4 2	293.83		55.58	(1 ⁻ ,0 ⁻)			
274.2 2	2.2 8	329.72	(1,0)	55.58	(1 ⁻ ,0 ⁻)			
304.5 2	6.8 15	598.26	(1,0)	293.83				
^x 320.6 1	4 1							
329.7 1	15 1	329.72	(1,0)	0.0	(1 ⁺)			
530.6 2	4 2	598.26	(1,0)	67.60	(1 ⁻ ,0 ⁻)			
572.9 1	36 2	640.54	(1 ⁺ ,0 ⁺)	67.60	(1 ⁻ ,0 ⁻)			
585.0 1	37 2	640.54	(1 ⁺ ,0 ⁺)	55.58	(1 ⁻ ,0 ⁻)			

[†] Additional information 1.

[‡] From 1979Ha26.

[#] Relative photon intensities (1979Ha26).

[@] The γ 's are assumed to be dipole or E2. Further, the 55.58 and 67.60 γ 's must be E1 or else the total intensity of these transitions would be greater than 100%.

[&] For absolute intensity per 100 decays, multiply by 0.049 15.

^x γ ray not placed in level scheme.

${}^{242}\text{U}$ β^- decay 1979Ha26

Decay Scheme

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

Legend

