^{235}Pa β^- decay 1969KaZX,1986Mi10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 122, 205 (2014)	1-Feb-2014

Parent: ^{235}Pa: E=0; J^π=(3/2$^-$); $T_{1/2}$=24.4 min *2*; Q(β^-)=1368 *14*; %β^- decay=100.0

The decay scheme is based mainly on the data of 1969KaZX and 1986Mi10, and on the levels of ^{235}U known from other sources. Based on the absolute intensities of γ rays with energies higher than about 300 keV, it has been concluded that the β^- decay of ^{235}Pa feeds almost exclusively (99.99%) levels below 50 keV. Other: 1992He12.

^{235}U Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	7/2$^-$	7.04×10^8 y *10*	$T_{1/2}$: From Adopted Levels.
0.1 *10*	1/2$^+$	≈26 min	$T_{1/2}$: From Adopted Levels.
13.1 *12*	3/2$^+$		
51.7 *13*	5/2$^+$		
81.7 *14*	7/2$^+$		
129.3	5/2$^+$		
393.9 *13*	3/2$^+$		
426.7 *14*	5/2$^+$		
637.8 *10*	3/2$^-$		
659.1 *13*	1/2$^-$		
703.7 *16*	3/2$^-$		

β^- radiations

E(decay)	E(level)	Iβ^-[†][‡]	Log *ft*	Comments
(664[#] *14*)	703.7	<0.01	>9	av Eβ= 219 *18*
(709[#] *14*)	659.1			
(730[#] *14*)	637.8			
(941[#] *14*)	426.7	≤0.01	≥9	
(974[#] *14*)	393.9	<0.01	>9.5	av Eβ= 331 *19* Log *ft*: compares with 7.3 in ^{233}Pa β^- decay.
(1239[#] *14*)	129.3			
1410 *50*	13.1	≈99.99	≈6.04	av Eβ= 476 *20* E(decay): from 1968Tr07. Iβ^-: sum of Iβ to the 1/2$^+$, 3/2$^+$ and 5/2$^+$ members of the 1/2[631] band, based on 1986Mi10. Most of the intensity, however, feeds the 3/2$^+$ level at 13 keV. Log *ft*: compares with log *ft*=6.7 to 3/2$^+$ and 7.1 to 1/2$^+$ in ^{233}Pa β^- decay.

† Additional information 1.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

$\gamma(^{235}U)$

Iγ≈3% (1968Tr07), ≤3% (1969KaZX) for the full γ-ray emission. 1986Mi10 (in disagreement) estimated an upper limit of 0.01% for the most intense γ rays (at 374.9 and 413.6 keV) in ^{235}Pa β^- decay.

U K x ray detected (1969KaZX,1968Tr07). U L x ray not analyzed. Most of the β^- decay (≈99.99%) feeds the low-lying 3/2$^+$ level at 13 keV (1986Mi10).

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^{235}Pa β^- decay 1969KaZX,1986Mi10 (continued)

$\gamma(^{235}U)$ (continued)

E_γ †	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	E_i(level)	J_i^π	E_f	J_f^π
(0.08)	0.1	$1/2^+$	0.0	$7/2^-$	374.9	426.7	$5/2^+$	51.7	$5/2^+$
(12.9)	13.1	$3/2^+$	0.1	$1/2^+$	381.0	393.9	$3/2^+$	13.1	$3/2^+$
(38.7)	51.7	$5/2^+$	13.1	$3/2^+$	393.7	393.9	$3/2^+$	0.1	$1/2^+$
(51.6)	51.7	$5/2^+$	0.1	$1/2^+$	413.6	426.7	$5/2^+$	13.1	$3/2^+$
(68.7)	81.7	$7/2^+$	13.1	$3/2^+$	637.8	637.8	$3/2^-$	0.0	$7/2^-$
127.8‡	129.3	$5/2^+$	0.0	$7/2^-$	645.7	659.1	$1/2^-$	13.1	$3/2^+$
x131.8					652.0	703.7	$3/2^-$	51.7	$5/2^+$
345.0	426.7	$5/2^+$	81.7	$7/2^+$	659.3	659.1	$1/2^-$	0.1	$1/2^+$

† From 1969KaZX. 1986Mi10 detected only the 375- and 414-keV γ rays.
‡ Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

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Decay Scheme