Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jagdish K. Tuli, and Edgardo Browne	NDS 185, 560 (2022)	31-Aug-2022

Q(β^-)=−1820 *50*; S(n)=5880 *5*; S(p)=5657 *4*; Q(α)=5576.3 *17* 2021Wa16
S(2n)=13547 *6*, S(2p)=10358 *3*, Q(ε)=381.6 *20* (2021Wa16).
1949Os01: ^{231}U formed and identified in ^{231}Pa(d,2n), ^{231}Pa(α,p3n), followed by chemical separation.
1950Cr28: ^{231}U identified as parent of ^{231}Pa.
1994Br36: detailed study of ε decay of ^{231}U to ^{231}Pa.
Theoretical studies: consult the NSR database (www.nndc.bnl.gov/nsr/) for 40 primary references, 10 for nuclear structure calculations and 30 for calculation of α-decay and cluster-decay half-lives. These references are listed in 'document' records in this dataset, which can be accessed through on-line ENSDF database at www.nndc.bnl.gov/ensdf/.
Additional information 1.

^{231}U Levels

9/2$^-$ member of configuration=ν5/2[752] (1973We08) is expected at 102 keV from rotational energy formula.

Cross Reference (XREF) Flags

A ^{231}Np ε decay (48.8 min)
B ^{235}Pu α decay (25.3 min)

E(level)†	J$^\pi$	$T_{1/2}$	XREF	Comments
0.0	(5/2$^-$)	4.2 d *1*	AB	%ε≈100; %α>0.004 *1* (1994Li12) %α: from 1994Li12. Other value: %α=0.0055 (1950Cr28, unpublished data) using ion-chamber method. J$^\pi$: from systematics (1972El21) with possible configuration=ν5/2[633], ν3/2[631] or ν5/2[752] for the g.s. Inertial parameter fits 5/2. Log *ft* values to 183, 320 levels in ^{231}Pa differ substantially from corresponding log *ft* values in ^{231}Th β^- decay and ^{235}Pu ε decay, thus favoring ν5/2[752] (1994Br36,1973We08). Other: 5/2$^+$ from systematics (2021Ko07). $T_{1/2}$: from 1949Os01. Other: 4.3 d (1950Cr28).
0+x?	(5/2$^+$)		B	E(level): x=40 *40* from systematics, could be close to the g.s. (analogy to ^{229}Th). J$^\pi$: populated by favored α transition from ^{235}Pu α decay.
45.1 *3*	(7/2$^-$)		A	7/2 member of configuration=ν5/2[752] (1973We08).
416.1 *3*			A	J$^\pi$: (3/2$^-$,5/2,7/2,9/2$^-$) from 416.3γ to (5/2$^-$); 370.9γ to (7/2$^-$).
421.1 *4*			A	J$^\pi$: (3/2$^-$,5/2,7/2,9/2$^-$) from 420.7γ to (5/2$^-$); 376.3γ to (7/2$^-$).
481.7 *4*			A	J$^\pi$: (3/2$^-$,5/2,7/2,9/2$^-$) from 481.6γ to (5/2$^-$); 436.9γ to (7/2$^-$).
1153.5 *4*			A	J$^\pi$: (3/2$^-$,5/2,7/2,9/2$^-$,11/2$^-$) from 1108.1γ to (7/2$^-$).
1268.1 *4*			A	

† From ^{231}Np ε decay, except for the tentative 40-keV level, which is from ^{235}Pu α decay.

Adopted Levels, Gammas (continued)

$\gamma(^{231}U)$

E_i(level)	J_i^π	E_γ [†]	I_γ [†]	E_f	J_f^π	Mult.	α [‡]	$I_{(\gamma+ce)}$
45.1	(7/2$^-$)	(45.1 *3*)		0.0	(5/2$^-$)	[M1+E2]	33×10^1 *28*	100
416.1		370.9 *3*	100	45.1	(7/2$^-$)			
		416.3 *3*	2.9 *6*	0.0	(5/2$^-$)			
421.1		376.3 *4*	61 *3*	45.1	(7/2$^-$)			
		420.7 *4*	100 *10*	0.0	(5/2$^-$)			
481.7		436.9 *4*	47 *10*	45.1	(7/2$^-$)			
		481.6 *5*	100 *19*	0.0	(5/2$^-$)			
1153.5		737.8 *3*	100 *6*	416.1				
		1108.1 *3*	44 *4*	45.1	(7/2$^-$)			
1268.1		786.6 *3*	26.8 *14*	481.7				
		851.6 *5*	100 *4*	416.1				

† From ^{231}Np ε decay.

‡ 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.

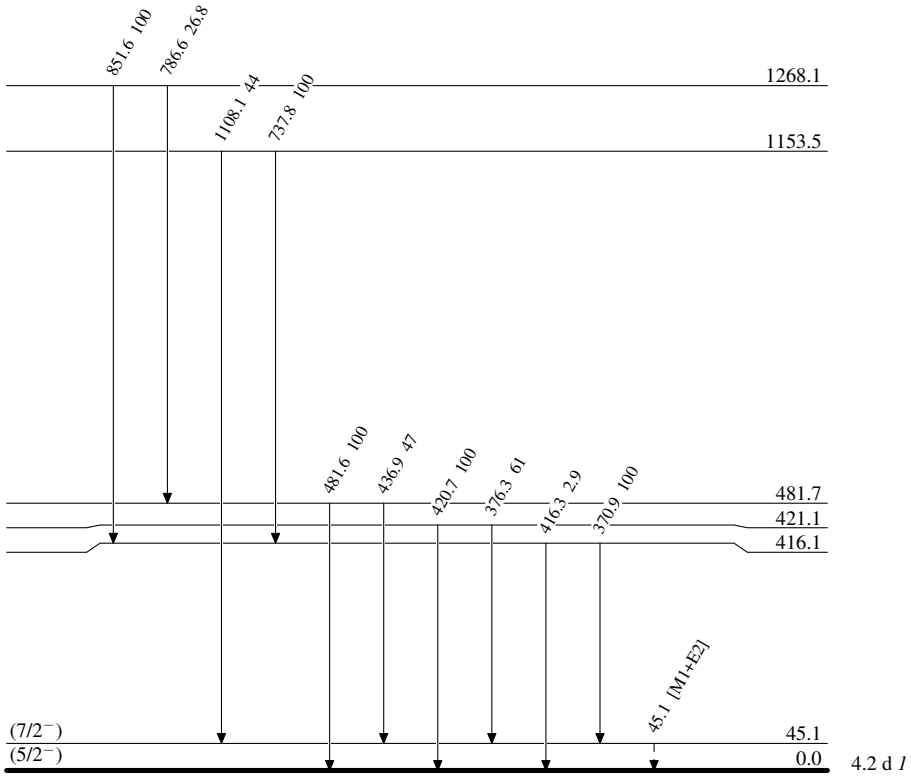
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{231}_{92}U_{139}$