Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107,2323 (2006)	15-Mar-2006

Q(β^-)=2136 *14*; S(n)=5878 *20*; S(p)=6017 *20*; Q(α)=3795 *19* 2012Wa38
Note: Current evaluation has used the following Q record 22.5E+2 105780 *22610*.0×10^2 SY37.0E+2 syst 2003Au03.
ΔS(p)=220 (syst), ΔQ(α)=300 (syst) 2003Au03.

Other reaction: ^{238}U(α,α'p) in 1984De22. E(α)=172 MeV; Proton and α spectra were taken at various angles and in coincidence with the incoming α's. The authors of 1984De22 deduced fast precompound emission and strong direct nucleon knockout in the (α,α') reaction. No level information.

^{237}Pa Levels

Cross Reference (XREF) Flags

A ^{238}U(t,α)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	XREF	Comments
0.0[#]	(1/2$^+$)	8.7 min *2*	A	%β^-=100 $T_{1/2}$: From 1974Ka05 (also reported in 1969TrZZ). Others: 10.5 min *20* (1954Cr46), 10 min (1961Pa22). J$^\pi$: from (t,α) data of 1977Th04. The log *ft* values for β^- feeding to ^{237}U are consistent with the assignments.
35[#] *2*	(3/2$^+$)		A	
90[@] *3*	(3/2$^-$)		A	
105[&] *5*	(9/2$^+$)		A	
147[@] *6*	(7/2$^-$)		A	
158[&] *6*	(13/2$^+$)		A	
202 *6*			A	
258 *4*			A	
319 *4*			A	
364[a] *4*	(3/2$^+$)		A	
393[a] *6*	(5/2$^+$)		A	
491 *4*			A	
554 *8*			A	
577 *8*			A	
624 *4*			A	
686 *8*			A	
714 *8*			A	
741 *8*			A	
972 *8*			A	
1025 *6*			A	
1112 *4*			A	

[†] All levels and their band assignments are from ^{238}U(t,α) data.
[‡] Spin and Nilsson state assignments were made in 1977Th04 from (t,α) data. These assignments were proposed from comparison of experimental cross sections with calculated ones. Tentative assignments of 11/2$^-$, 9/2[514] to the 624- and 5/2$^-$, 1/2[541] to the 1025-keV levels are not included here. See ^{238}U(t,α) section for the proposed assignments.
[#] Band(A): 1/2[400] band.

Continued on next page (footnotes at end of table)

Adopted Levels (continued)

^{237}Pa Levels (continued)

[@] Band(B): 1/2[530] band.
[&] Band(C): 3/2[651] band. Small band parameter (A=2.2), and enhanced (t,α) populations indicate that this band is strongly influenced by Coriolis coupling, probably with 1/2[660] and 5/2[642] bands, not yet identified. See 1977Th04 for discussions.
[a] Band(D): 3/2[402] band.

Adopted Levels

Band(D): 3/2[402] band

$(5/2^+)$ **393**

$(3/2^+)$ **364**

Band(C): 3/2[651] band

$(13/2^+)$ **158**

Band(B): 1/2[530] band

$(7/2^-)$ **147**

$(9/2^+)$ **105**

$(3/2^-)$ **90**

Band(A): 1/2[400] band

$(3/2^+)$ **35**

$(1/2^+)$ **0.0**

$^{237}_{91}Pa_{146}$