

²³⁸U(d,t) 1970Bo31,1972Er03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 3323 (2006)	15-Mar-2006

1970Bo31: Target: ²³⁸U; Projectile: d, E=17 MeV.

1972Er03: Target: depleted ²³⁸U; Projectile: d, E=9, 12 MeV.

Q(d,t)=116.6 (1967Er02)

The fission probability at higher excitation energies following ²³⁸U(d,t) reaction was determined in 1992Si06 by using 24.85-MeV d beam and measuring the energy spectrum of tritons in coincidence with the fission fragments, in addition to the single spectrum.

²³⁷U Levels

E(α,β,E) 1/2[631] band.

E(level) [†]	J ^π #	L@	S&	Comments
0	1/2 ⁺		0.06	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.063 5 (1972Er03).
11 [‡] 4	3/2 ⁺		0.34	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.159 12 (1972Er03).
54 [‡] 4	5/2 ⁺		0.02	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.0018 4 (1972Er03).
81 [‡] 4	7/2 ⁺	4	0.12	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.067 14 (1972Er03).
161 ^{‡c} 3	5/2 ⁺		0.09	
161 ^{‡a} 3	9/2 ⁺		0.32 ^b	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.048 16 (1972Er03); contribution from other doublet member was removed. Cross sections for the 5/2 ⁺ , 5/2[622] state was estimated from its yield in ²³⁶ U(d,t) ²³⁵ U reaction.
204 ^{‡c} 3	7/2 ⁺			
204 ^{‡a} 3	11/2 ⁺		0.49 ^d	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.065 18 (1972Er03); contribution from other doublet member was removed. Cross sections for the 7/2 ⁺ , 5/2[622] state was estimated from its yield in ²³⁶ U(d,t) ²³⁵ U reaction.
261 ^{‡c} 3	9/2 ⁺	4	0.68	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.071 4 (1972Er03).
368 ^e 4	11/2 ⁻		0.42	
484 3				
509 ^e 3	15/2 ⁻	7	2.64	
530 4				
545 4				
575 3				
668 ^f 4	3/2 ⁺		0.03 ^g	
699 ^f 3	5/2 ⁺		0.26	
807 ^f 3	9/2 ⁺		0.48	
867 ^{‡h} 3	1/2 ⁻	0,1	0.78	(dσ/dΩ)(exp)/((2J+1) dσ/dΩ(DWBA))=0.38 3 (1972Er03).
910 ^h 3	3/2 ⁻ & 5/2 ⁻		0.29	
950 ⁱ 3	9/2 ⁺	4	0.72	
984 4				
1013 ^j 4	(7/2 ⁻ & 9/2 ⁻)		0.18 ^k	
1112 3				
1155 3				
1189 3				
1208 4				
1247 3				
1375 3				
1583 3				
1612 3				
1717 4				
1741 4				

Continued on next page (footnotes at end of table)

 $^{238}\text{U}(\text{d,t})$ **1970Bo31,1972Er03 (continued)**

 ^{237}U Levels (continued)

† From 1970Bo31, except otherwise noted.

‡ Reported both in 1970Bo31 and 1972Er03, average value.

Spin and Nilsson-state assignments were made in 1970Bo31 and 1972Er03 from comparison of experimental spectroscopic factors with the calculated values, and from L values.

@ Deduced in 1970Bo31 from $d\sigma(^3\text{He},\alpha)/d\sigma(\text{d,t})$.

& $S=(d\sigma/d\Omega)(\text{exp})/N(d\sigma/d\Omega)(\text{DWBA})$, from 1970Bo31. The normalization factor N was taken as 3.33. See also 1975Ga23 for calculated cross sections.

^a Level assumed doublet.

^b Estimated in 1970Bo31 by dividing the total intensity in the same ratio as the theoretical differential cross sections (1970Bo31).

^c 5/2[622] band.

^d S for the 7/2⁺,5/2[622] state was assumed zero (1970Bo31).

^e 7/2[743] band.

^f 3/2[631] band.

^g Found to be an order of magnitude too large for 3/2⁺,3/2[631] state (1970Bo31).

^h 1/2[501] band.

ⁱ 5/2[633] band.

^j May belong to 1/2[501] band.

^k This value is more than twice the calculated value (1970Bo31).