Energy levels and branching ratios [94Ba52].

$^{179}_{73}$Ta

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
							E_f^*:	0.0	30.7	133.8	180.8	238.6
[keV]		(p,t)	μb/sr	*rel.*	Γ_{cm}		$2J_f^\pi$:	7^+	$\langle 9\rangle^-$	$\langle 9^+\rangle$	$\langle 11^-\rangle$	$\langle 5\rangle^+$
0.0	7^+	0	1076	100	1.82(3) yr	82Wa10						
30.7(1)	$\langle 9\rangle^-$				1.42(8) μs			100				
133.78(11)	$\langle 9^+\rangle$	$\langle 2\rangle$	96.2	8.9		82Wa10		100				
180.79(14)	$\langle 11^-\rangle$								100			
238.56(9)	$\langle 5\rangle^+$				65(10) ns			100				
294.65(14)	$\langle 11^+\rangle$	$\langle 4\rangle$	48.3	4.5		82Wa10		30(6)		70(12)		
343.95(13)	$\langle 7^+\rangle$											100
356.19(15)	$\langle 13^-\rangle$								14(1)		86	
477.19(21)	$\langle 9^+\rangle$		19.1	1.8		82Wa10						15(3)
481.25(16)	$\langle 13^+\rangle$									59		
520.23(18)	$\langle 1\rangle^+$				335(45) ns							100
527.52(15)	$\langle 3^+\rangle$											100
555.58(17)	$\langle 15^-\rangle$										19(2)	
627.99(15)	$\langle 5^-\rangle$				80(7) ns							33(5)
628.03+X	$\langle 9^-\rangle$											
636.70(23)	$\langle 11^+\rangle$											
673.01(22)	$\langle 5^+\rangle$											
691.87(18)	$\langle 15^+\rangle$											
696.00(21)	$\langle 7^+\rangle$		7.0	0.7		82Wa10						
741.4(6)												
750.2(4)	$\langle 1,3,5^+\rangle$											
757(5)			2.9	0.3		82Wa10						
777.70(18)	$\langle 17^-\rangle$											
781.18+X	$\langle 13^-\rangle$											
820.96(25)	$\langle 13^+\rangle$		4.5	0.4		82Wa10						
875(5)			13.4	1.2		82Wa10						
924.59(21)	$\langle 17^+\rangle$											
938.0(3)	$\langle 9^+\rangle$		3.3	0.3		82Wa10						
987.6(3)	$\langle 11^+\rangle$											
1017(5)			4.8	0.4		82Wa10						
1020.19(20)	$\langle 19^-\rangle$											
1028.5(3)	$\langle 15^+\rangle$		6.3	0.6		82Wa10						
1044.88+X	$\langle 17^-\rangle$											
1105(10)			2.9	0.3		82Wa10						
1129(10)			4.7	0.4		82Wa10						
1176.97(24)	$\langle 19^+\rangle$		2.6	0.2		82Wa10						
1206(10)			5.9	0.6		82Wa10						
1252.61(23)	$\langle 21^-\rangle$				322(16) ns							
1256.1(3)	$\langle 17^+\rangle$											
1281.8(3)	$\langle 21^-\rangle$											
1298(10)	7^+	0	10.3	1.0		82Wa10						
1317.3(4)	$\langle 25^+\rangle$				9.0(2) ms							
1327.9(4)	$\langle 23^-\rangle$				1.6(4) μs							
1351(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	15.1	1.4		82Wa10						
1389.0(4)	$\langle 15^+\rangle$											

(continued) **$^{179}_{73}$Ta**

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*:	0.0	30.7	133.8	180.8	238.6
[keV]		(p,t)	μb/sr	*rel.*	Γ_{cm}		$2J_f^\pi$:	7^+	$\langle 9\rangle^-$	$\langle 9^+\rangle$	$\langle 11^-\rangle$	$\langle 5\rangle^+$
1414.4+X	$\langle 21^-\rangle$											
1423(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	4.3	0.4		82Wa10						
1446.8(3)	$\langle 21^+\rangle$		6.7	0.6		82Wa10						
1475(10)	7^+	0	5.9	0.5		82Wa10						
1503.4(4)	$\langle 19^+\rangle$											
1527(10)	7^+	0	95.6	8.9		82Wa10						
1542.5(3)	$\langle 23^-\rangle$											
1557.9(3)	$\langle 23^-\rangle$											
1561(5)			>12	>1.2		82Wa10						
1576(10)			11.2	1.0		82Wa10						
1591.2(4)	$\langle 27^+\rangle$											
1602.3(4)	$\langle 25^-\rangle$											
1610(10)			7.7	0.7		82Wa10						
1628.8(3)	$\langle 19^+,21^-\rangle$				≤1 ns							
1635(10)			7.6	0.7		82Wa10						
1705(10)			10.9	1.0		82Wa10						
1730.3(6)	$\langle 23^+\rangle$											
1738.0(9)	$\langle 19,21\rangle$											
1739(10)	7^+	0	34.0	3.2		82Wa10						
1765.7(6)	$\langle 21^+\rangle$											
1778(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	12.4	1.2		82Wa10						
1813(10)			18.9	1.8		82Wa10						
1833.1(7)	$\langle 21^+,23^-\rangle$											
1848.0(4)	$\langle 25^-\rangle$											
1848.7(4)	$\langle 25^-\rangle$											
1857(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	>8.4	0.8		82Wa10						
1878(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	49.7	4.6		82Wa10						
1880.5(9)	$\langle 19^+\rangle$											
1881.2+X	$\langle 25^-\rangle$											
1884.8(4)	$\langle 29^+\rangle$											
1899.7(4)	$\langle 27^-\rangle$											
1905(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	30.9	2.9		82Wa10						
1958(10)	7^+	0	65.8	6.1		82Wa10						
2026.4(4)	$\langle 25^+\rangle$											
2043.8(7)	$\langle 23^+\rangle$											
2058.8(7)	$\langle 23^+,25^-\rangle$											
2093(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	33.5	3.1		82Wa10						
2123(10)			46.8	4.3		82Wa10						
2145.2(4)	$\langle 27^-\rangle$											
2162.4(6)	$\langle 27^-\rangle$											
2197.9(4)	$\langle 31^+\rangle$											
2212(10)	$X^{\langle +\rangle}$	$\langle 2\rangle$	35.5	3.3		82Wa10						
2219.2(4)	$\langle 29^-\rangle$											
2305.1(9)	$\langle 25^+,27^-\rangle$											
2329.9(7)	$\langle 27^+\rangle$											

(continued) **$^{179}_{73}$Ta**

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	30.7	133.8	180.8	238.6
[keV]		(p,t)	μb/sr	*rel.*	Γ_{cm}		$2J_f^\pi$: 7^+	$\langle 9\rangle^-$	$\langle 9^+\rangle$	$\langle 11^-\rangle$	$\langle 5\rangle^+$
2331.5(8)	$\langle 25^+\rangle$										
2433.7+X	$\langle 29^-\rangle$										
2450.3(6)	$\langle 29^-\rangle$										
2513.6(7)	$\langle 29^-\rangle$										
2530.5(4)	$\langle 33^+\rangle$										
2560.9(6)	$\langle 31^-\rangle$										
2631.7(9)	$\langle 27^+\rangle$										
2639.3(5)	$\langle 37^+\rangle$				54.1(17) ms						
2641.3(9)	$\langle 29^+\rangle$										
2654.1(9)	$\langle 31\rangle$										
2757.0(8)	$\langle 31^-\rangle$										
2792.7(4)	$\langle 33^-\rangle$				17(3) ns						
2863.7(8)	$\langle 31^-\rangle$										
2881.5(7)	$\langle 35^+\rangle$										
2921.3(7)	$\langle 33^-\rangle$										
2928.7(5)	$\langle 35^-\rangle$										
2936.4(10)	$\langle 29^+\rangle$										
2955.2(11)	$\langle 31^+\rangle$										
3049.7(6)	$\langle 39^+\rangle$										
3057.0+X	$\langle 33^-\rangle$										
3071.7(10)	$\langle 33^-\rangle$										
3163.0(5)	$\langle 37^-\rangle$										
3185.1(9)	$\langle 35\rangle$										
3227.4(9)	$\langle 33^-\rangle$										
3250.8(7)	$\langle 37^+\rangle$										
3252.1(12)	$\langle 31^+\rangle$										
3266.8(12)	$\langle 33^+\rangle$										
3394.6(8)	$\langle 35^-\rangle$										
3443.8(7)	$\langle 39^-\rangle$										
3480.8(6)	$\langle 41^+\rangle$										
3637.5(9)	$\langle 39^+\rangle$										
3736.2+X	$\langle 37^-\rangle$										
3737.7(13)	$\langle 37^-\rangle$										
3758.1(8)	$\langle 41^-\rangle$										
3932.0(6)	$\langle 43^+\rangle$										
4041.1(11)	$\langle 41^+\rangle$										
4101.4(9)	$\langle 43^-\rangle$										
4402.1(8)	$\langle 45^+\rangle$										
4464.8+X	$\langle 41^-\rangle$										
4471.6(11)	$\langle 45^-\rangle$										
4865.1(12)	$\langle 47^-\rangle$										
4890.7(9)	$\langle 47^+\rangle$										
5225.3+X	$\langle 45^-\rangle$										
5390.6(10)	$\langle 49^+\rangle$										
16807(11)	$\langle 3\rangle^-$				65 keV						

(continued) **$^{179}_{73}$Ta**

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
							E_f^*:	0.0	30.7	133.8	180.8	238.6
[keV]		(p,t)	μb/sr	*rel.*	Γ_{cm}		$2J_f^\pi$:	7^+	$\langle 9\rangle^-$	$\langle 9^+\rangle$	$\langle 11^-\rangle$	$\langle 5\rangle^+$
17238												
		82Wa10				Ref.						

Additional data on this isotope can be found in [97Ko13].
11 bands are assigned to excited states of this nucleus in [97Ko13].
Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [94Ba52]. Part 2 **$^{179}_{73}$Ta**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	294.6	343.95	356.19	477.19	481.25	520.23	527.52	555.58	628.0+X	636.70
[keV]		$2J_f^\pi$:	$\langle 11^+\rangle$	$\langle 7^+\rangle$	$\langle 13^-\rangle$	$\langle 9^+\rangle$	$\langle 13^+\rangle$	$\langle 1\rangle^+$	$\langle 3^+\rangle$	$\langle 15^-\rangle$	$\langle 9^-\rangle$	$\langle 11^+\rangle$
477.19(21)	$\langle 9^+\rangle$			85								
481.25(16)	$\langle 13^+\rangle$		41(7)									
527.52(15)	$\langle 3^+\rangle$							x				
555.58(17)	$\langle 15^-\rangle$				81							
627.99(15)	$\langle 5^-\rangle$			22(4)					45(7)			
636.70(23)	$\langle 11^+\rangle$			33(6)		67						
673.01(22)	$\langle 5^+\rangle$							25(7)	75(22)			
691.87(18)	$\langle 15^+\rangle$		65				35(4)					
696.00(21)	$\langle 7^+\rangle$								100			
741.4(6)									100			
750.2(4)	$\langle 1,3,5^+\rangle$							26(14)	74(23)			
777.70(18)	$\langle 17^-\rangle$				33(2)					67		
781.18+X	$\langle 13^-\rangle$										100	
820.96(25)	$\langle 13^+\rangle$					24(5)						76(16)
924.59(21)	$\langle 17^+\rangle$						78					
1020.19(20)	$\langle 19^-\rangle$									34(1)		
1028.5(3)	$\langle 15^+\rangle$											38(6)

Energy levels and branching ratios [94Ba52]. Part 3 **$^{179}_{73}$Ta**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	673.01	691.87	696.00	777.70	781.2+X	820.96	924.59	987.6	1020.19	1028.5
[keV]		$2J_f^\pi$:	$\langle 5^+\rangle$	$\langle 15^+\rangle$	$\langle 7^+\rangle$	$\langle 17^-\rangle$	$\langle 13^-\rangle$	$\langle 13^+\rangle$	$\langle 17^+\rangle$	$\langle 11^+\rangle$	$\langle 19^-\rangle$	$\langle 15^+\rangle$
924.59(21)	$\langle 17^+\rangle$			22(5)								
938.0(3)	$\langle 9^+\rangle$		21(6)		79(24)							
987.6(3)	$\langle 11^+\rangle$				100							
1020.19(20)	$\langle 19^-\rangle$					66						
1028.5(3)	$\langle 15^+\rangle$							62				

(continued) **$^{179}_{73}$Ta**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	673.01	691.87	696.00	777.70	781.2+X	820.96	924.59	987.6	1020.19	1028.5
[keV]	$2J_f^\pi$:	$\langle 5^+\rangle$	$\langle 15^+\rangle$	$\langle 7^+\rangle$	$\langle 17^-\rangle$	$\langle 13^-\rangle$	$\langle 13^+\rangle$	$\langle 17^+\rangle$	$\langle 11^+\rangle$	$\langle 19^-\rangle$	$\langle 15^+\rangle$
1044.88+X	$\langle 17^-\rangle$					100					
1176.97(24)	$\langle 19^+\rangle$		83					17(3)			
1252.61(23)	$\langle 21^-\rangle$				45(4)					55(4)	
1256.1(3)	$\langle 17^+\rangle$						45(7)				55
1281.8(3)	$\langle 21^-\rangle$				41(6)					59	
1389.0(4)	$\langle 15^+\rangle$								100		
1446.8(3)	$\langle 21^+\rangle$							76			
1503.4(4)	$\langle 19^+\rangle$										52
1557.9(3)	$\langle 23^-\rangle$									42(6)	

Energy levels and branching ratios [94Ba52]. Part 4 **$^{179}_{73}$Ta**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	1045+X	1176.97	1252.61	1256.1	1281.8	1317.3	1327.9	1389.0	1414+X	1446.8
[keV]	$2J_f^\pi$:	$\langle 17^-\rangle$	$\langle 19^+\rangle$	$\langle 21^-\rangle$	$\langle 17^+\rangle$	$\langle 21^-\rangle$	$\langle 25^+\rangle$	$\langle 23^-\rangle$	$\langle 15^+\rangle$	$\langle 21^-\rangle$	$\langle 21^+\rangle$
1317.3(4)	$\langle 25^+\rangle$			100							
1327.9(4)	$\langle 23^-\rangle$			100							
1414.4+X	$\langle 21^-\rangle$	100									
1446.8(3)	$\langle 21^+\rangle$		24(5)								
1503.4(4)	$\langle 19^+\rangle$				48(8)						
1542.5(3)	$\langle 23^-\rangle$			100							
1557.9(3)	$\langle 23^-\rangle$					58					
1591.2(4)	$\langle 27^+\rangle$						100				
1602.3(4)	$\langle 25^-\rangle$							100			
1628.8(3)	$\langle 19^+,21^-\rangle$			100							
1730.3(6)	$\langle 23^+\rangle$		52								48(13)
1738.0(9)	$\langle 19,21\rangle$			100							
1765.7(6)	$\langle 21^+\rangle$				60						
1848.0(4)	$\langle 25^-\rangle$					41(9)					
1848.7(4)	$\langle 25^-\rangle$			17(5)							
1880.5(9)	$\langle 19^+\rangle$								100		
1881.2+X	$\langle 25^-\rangle$									100	
1884.8(4)	$\langle 29^+\rangle$						24(4)				
1899.7(4)	$\langle 27^-\rangle$							52			
2026.4(4)	$\langle 25^+\rangle$										78

Energy levels and branching ratios [94Ba52]. Part 5 **$^{179}_{73}$Ta**

E^*	$2J^\pi$		Branching ratios in percentage									
		E^*_f:	1503.4	1542.5	1557.9	1591.2	1602.3	1628.8	1730.3	1765.7	1833.1	1848.0
[keV]		$2J^\pi_f$:	$\langle 19^+\rangle$	$\langle 23^-\rangle$	$\langle 23^-\rangle$	$\langle 27^+\rangle$	$\langle 25^-\rangle$		$\langle 23^+\rangle$	$\langle 21^+\rangle$		$\langle 25^-\rangle$
1765.7(6)	$\langle 21^+\rangle$		40(11)									
1833.1(7)	$\langle 21^+,23^-\rangle$							100				
1848.0(4)	$\langle 25^-\rangle$				59							
1848.7(4)	$\langle 25^-\rangle$			83								
1884.8(4)	$\langle 29^+\rangle$					76						
1899.7(4)	$\langle 27^-\rangle$						48(9)					
2026.4(4)	$\langle 25^+\rangle$								22(12)			
2043.8(7)	$\langle 23^+\rangle$		60							40(8)		
2058.8(7)	$\langle 23^+,25^-\rangle$							12(7)			88	
2145.2(4)	$\langle 27^-\rangle$				46(10)							54
2162.4(6)	$\langle 27^-\rangle$			39(8)								
2197.9(4)	$\langle 31^+\rangle$					41(10)						
2219.2(4)	$\langle 29^-\rangle$						65					
2305.1(9)	$\langle 25^+,27^-\rangle$										39(17)	
2329.9(7)	$\langle 27^+\rangle$								85			
2331.5(8)	$\langle 25^+\rangle$									56		
2450.3(6)	$\langle 29^-\rangle$											58

Energy levels and branching ratios [94Ba52]. Part 6 **$^{179}_{73}$Ta**

E^*	$2J^\pi$		Branching ratios in percentage									
		E^*_f:	1848.7	1881+X	1884.8	1899.7	2026.4	2043.8	2058.8	2145.2	2162.4	2197.9
[keV]		$2J^\pi_f$:	$\langle 25^-\rangle$	$\langle 25^-\rangle$	$\langle 29^+\rangle$	$\langle 27^-\rangle$	$\langle 25^+\rangle$	$\langle 23^+\rangle$		$\langle 27^-\rangle$	$\langle 27^-\rangle$	$\langle 31^+\rangle$
2162.4(6)	$\langle 27^-\rangle$		61									
2197.9(4)	$\langle 31^+\rangle$				59							
2219.2(4)	$\langle 29^-\rangle$					35(5)						
2305.1(9)	$\langle 25^+,27^-\rangle$								61			
2329.9(7)	$\langle 27^+\rangle$						15(5)					
2331.5(8)	$\langle 25^+\rangle$							44(17)				
2433.7+X	$\langle 29^-\rangle$			100								
2450.3(6)	$\langle 29^-\rangle$									42(12)		
2513.6(7)	$\langle 29^-\rangle$		39(13)								61	
2530.5(4)	$\langle 33^+\rangle$				51							49(12)
2560.9(6)	$\langle 31^-\rangle$					64(13)						
2631.7(9)	$\langle 27^+\rangle$							61				
2641.3(9)	$\langle 29^+\rangle$						100					
2654.1(9)	$\langle 31\rangle$				100							
2757.0(8)	$\langle 31^-\rangle$									55		
2792.7(4)	$\langle 33^-\rangle$											x
2863.7(8)	$\langle 31^-\rangle$										38(12)	
2881.5(7)	$\langle 35^+\rangle$											60(13)

Energy levels and branching ratios [94Ba52]. Part 7 **$^{179}_{73}$Ta**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	2219.2	2329.9	2331.5	2434+X	2450.3	2513.6	2530.5	2560.9	2631.7	2639.3
[keV]		$2J_f^\pi$:	$\langle 29^- \rangle$	$\langle 27^+ \rangle$	$\langle 25^+ \rangle$	$\langle 29^- \rangle$	$\langle 29^- \rangle$	$\langle 29^- \rangle$	$\langle 33^+ \rangle$	$\langle 31^- \rangle$	$\langle 27^+ \rangle$	$\langle 37^+ \rangle$
2560.9(6)	$\langle 31^- \rangle$		36(9)									
2631.7(9)	$\langle 27^+ \rangle$				39(14)							
2639.3(5)	$\langle 37^+ \rangle$								100			
2641.3(9)	$\langle 29^+ \rangle$			≤10								
2757.0(8)	$\langle 31^- \rangle$						45(15)					
2792.7(4)	$\langle 33^- \rangle$		85(8)						x	15(4)		
2863.7(8)	$\langle 31^- \rangle$							62(19)				
2881.5(7)	$\langle 35^+ \rangle$								40(13)			
2921.3(7)	$\langle 33^- \rangle$		≤25							100		
2936.4(10)	$\langle 29^+ \rangle$				74						26(10)	
2955.2(11)	$\langle 31^+ \rangle$			100								
3049.7(6)	$\langle 39^+ \rangle$											100
3057.0+X	$\langle 33^- \rangle$					100						
3071.7(10)	$\langle 33^- \rangle$						30(20)					
3250.8(7)	$\langle 37^+ \rangle$								55(18)			
3252.1(12)	$\langle 31^+ \rangle$										100	
3480.8(6)	$\langle 41^+ \rangle$											15(5)

Energy levels and branching ratios [94Ba52]. Part 8 **$^{179}_{73}$Ta**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	2641.3	2757.0	2792.7	2863.7	2881.5	2928.7	3049.7	3057+X	3071.7	3163.0
[keV]		$2J_f^\pi$:	$\langle 29^+ \rangle$	$\langle 31^- \rangle$	$\langle 33^- \rangle$	$\langle 31^- \rangle$	$\langle 35^+ \rangle$	$\langle 35^- \rangle$	$\langle 39^+ \rangle$	$\langle 33^- \rangle$	$\langle 33^- \rangle$	$\langle 37^- \rangle$
2928.7(5)	$\langle 35^- \rangle$				100							
3071.7(10)	$\langle 33^- \rangle$			70(10)								
3163.0(5)	$\langle 37^- \rangle$				19(6)			81				
3185.1(9)	$\langle 35 \rangle$				100							
3250.8(7)	$\langle 37^+ \rangle$						45(18)					
3266.8(12)	$\langle 33^+ \rangle$		100									
3394.6(8)	$\langle 35^- \rangle$			100							≤25	
3443.8(7)	$\langle 39^- \rangle$							53				47(10)
3480.8(6)	$\langle 41^+ \rangle$								85			
3637.5(9)	$\langle 39^+ \rangle$						62(25)					
3736.2+X	$\langle 37^- \rangle$									100		
3737.7(13)	$\langle 37^- \rangle$										100	
3758.1(8)	$\langle 41^- \rangle$											63
3932.0(6)	$\langle 43^+ \rangle$								15(5)			

Energy levels and branching ratios [94Ba52]. Part 9

$^{179}_{73}$Ta

E^*	$2J^\pi$	Branching ratios in percentage										
	E_f^*:	3250.8	3443.8	3480.8	3637.5	3736+X	3758.1	3932.0	4101.4	4402.1	4465+X	4890.7
[keV]	$2J_f^\pi$:	$\langle 37^+\rangle$	$\langle 39^-\rangle$	$\langle 41^+\rangle$	$\langle 39^+\rangle$	$\langle 37^-\rangle$	$\langle 41^-\rangle$	$\langle 43^+\rangle$	$\langle 43^-\rangle$	$\langle 45^+\rangle$	$\langle 41^-\rangle$	$\langle 47^+\rangle$
3637.5(9)	$\langle 39^+\rangle$	38(12)										
3758.1(8)	$\langle 41^-\rangle$		37(13)									
3932.0(6)	$\langle 43^+\rangle$			85								
4041.1(11)	$\langle 41^+\rangle$	100			≤33							
4101.4(9)	$\langle 43^-\rangle$		47(11)				53(11)					
4402.1(8)	$\langle 45^+\rangle$			20(6)				80				
4464.8+X	$\langle 41^-\rangle$					100						
4471.6(11)	$\langle 45^-\rangle$						100					
4865.1(12)	$\langle 47^-\rangle$								100			
4890.7(9)	$\langle 47^+\rangle$							27(7)		73		
5225.3+X	$\langle 45^-\rangle$										100	
5390.6(10)	$\langle 49^+\rangle$									30(12)		70

Energy levels and branching ratios [03Wu10].

$^{180}_{73}$Ta

E^*	J^π	L	L	C^2S	I_d	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
										E_f^*:	0.0	39.7	77.1	108	111
[keV]		(α,t)	(p,d)	(p,d)		(d,t)	(d,t)	Γ_{cm}		J_f^π:	1^+	2^+	9^-	0^-	3^+
0.0*	1^+		4	1.4	561	4	1.09	8.154(6) h	83Wa01						
39.67(4)*	2^+		4	1.7	1009	4	2.79		83Wa01		100				
77.1(8)	9^-							$>1{\cdot}10^{15}$ yr							
107.85(4)	0^-							19.2(7) ns			100				
110.9(1)*	3^+		6	1.7	1765	6	1.30		83Wa01			100			
130.55(7)	1^-													x	
171.28(6)	2^-													≈12	
177.65(3)*	8^+			0.91	5305	4	0.69	70.0(14) ns	83De43				100		
185.0(1)*	4^+	4		incl	3050	6	0.35		83De43						100
234.48(6)	3^-														
258(2)															
280.03(8)	10^-												100		
311.0(1)*	5^+		6	0.91	3345	6	1.16								20(2)
318.35(6)	4^-														
320.46(5)	1^+										60	40(2)			
356.68(6)	7^+	2						42(3) ns							
370.98(5)	2^+										49	22(1)			29(2)
373.7(1)*	9^+		6	1.2	5798	6	1.42								
416.4(1)*	6^+				3364										
420.00(7)	5^-														
423.6(1)**	1^-		3	0.77	3726	3	0.56				5(1)	10(2)		56(2)	
425.8					608										
448.00(6)	3^+											64			16(2)
463.2(1)***	7^-				4879	5	0.64	31.2(19) ns							

(continued) **$^{180}_{73}$Ta**

E^*	J^π	L	L	C^2S	I_d	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
									E_f^*:	0.0	39.7	77.1	108	111
[keV]		(α,t)	(p,d)	(p,d)		(d,t)	(d,t)	Γ_{cm}	J_f^π:	1^+	2^+	9^-	0^-	3^+
478.2(1)**	2^-		3	1.2	11073	3	0.48			17(3)	13(3)			
505.21(7)	11^-											18.5(5)		
515.56(5)	8^+							<1 ns				5.1(7)		
520.14(8)	4^+							37.4(20) ns						78(3)
544.4(1)**	3^-		3	0.83	11041	3	0.64							
547.79(8)	6^-													
548.01(9)	4^+													83
549.5(1)****	3^-		1		12556									
559.63(5)	2^+									12	52			28
572.2					743									
574.5(1)**	6^-		3	0.67	25142	3	0.65	<2 ns						
575.57(6)	8^+							<1 ns						
594.43(16)	$\langle 5\rangle$							16.1(19) ns						
595.0(1)*	10^+				3637	6	1.95							
600.4(1)*	7^+				1687									
624.27(6)	3^+									38				
641.65(11)	5^+													
645.8(1)****	$\langle 4^-\rangle$		1		2024	3	1.43							
653.67(6)	1^-				611									
658.5(1)**	$\langle 4^-\rangle$		3	1.1	15725									
663.9(1)****	$\langle 4^-\rangle$		1	incl	12943									
672.15(13)	$\langle 4\rangle$													
676.47(10)	5^+													
680.4(1)***	8^-					5	0.72							
680.5					1221									
684.1(3)	$\langle 6\rangle$													
686.00(9)	7^-													
708.29(6)	2^-													
717.3					2426									
722.02(7)	4^-		1	1.1	65900	1	0.95							
723.23(7)	9^+													
729.75(11)														
731.31(9)														
735.10(15)	$\langle 6\rangle$				2262									
735.33(10)	8^+													
738.65(12)	$\langle 5\rangle$													
752.33(8)	12^-													
756.44(10)					3378									
763.3(1)**	7^-		3	1.0	18007	3	0.54							
775.9(10)	$\langle 2\rangle$												100	
784.5(1)****	$\langle 5^-\rangle$				12731									
787.33(11)	$\langle 6^+\rangle$													
788.10(10)	$\langle 3^-\rangle$		1	1.0	41177	1	0.98							
788.54(11)	3^-													
792.65(17)	$\langle 5\rangle$													

(continued) **$^{180}_{73}$Ta**

E^* [keV]	J^π	L (α,t)	L (p,d)	C^2S (p,d)	I_d	L (d,t)	C^2S (d,t)	$T_{1/2}$ orRef. Γ_{cm}	Branching ratios in percentage E_f^*: 0.0 39.7 77.1 108 111 J_f^π: 1^+ 2^+ 9^- 0^- 3^+
806.63(6)	9^+								
809.54(13)	$\langle 5^- \rangle$				2632				
809.55(10)	$\langle 5^- \rangle$								
820(2)									
830.34(9)	$\langle 6 \rangle$								
835.81(12)	5^-		3	0.67	8794	3	0.59		
840.49(8)	11^+								
857.20(13)	8^-								
862.02(20)	$\langle 7 \rangle$								
864.01(12)									
865.51(12)									
875(8)	4^-					3	0.23		
876.97(6)	$\langle 2^- \rangle$				626				
880.80(7)									
884.25(13)					528				
891.56(11)	$\langle 7 \rangle$				1121				
892.92(12)									
893.15(15)	$\langle 6 \rangle$				1471				
896.86(12)	$\langle 7 \rangle$								
906.07(10)	$\langle 7 \rangle$								
907.51(10)	4^-		1	1.2	5419				
917.00(7)	7				3695				
922.43(10)	9^-								
935.25(8)									
938.95(19)	$\langle 6 \rangle$						0.47		
951.68(7)					2126				
956.09(8)	10^+								
956.65(12)	7^+								
973.0					1296				
976.3(1)**	8^-				1351				
977.18(11)	9^+								
986.2					1607				
991.75(12)									
996.64(9)									
1003.7					2817				
1016.3(3)	$\langle 7 \rangle$								
1020.70(9)	13^-								
1030.68(13)	9^-								
1034.7(10)	$\langle 7 \rangle$								
1037.22(8)									
1043.24(13)									
1053.8(10)									
1056.86(7)	10^+								
1062.6					4177				
1075.9					710				

(continued) **$^{180}_{73}$Ta**

E^*	J^π	L	L	C^2S	I_d	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
										E_f^*:	0.0	39.7	77.1	108	111
[keV]		(α,t)	(p,d)	(p,d)		(d,t)	(d,t)	Γ_{cm}		J_f^π:	1^+	2^+	9^-	0^-	3^+
1079.23(14)	⟨8⟩							≤35 ps							
1080.0					1344										
1100.85(15)															
1109.63(9)	12^+														
1113.24(9)															
1122(2)															
1141.22(12)	10^+														
1149.60(14)	8^+														
1174.94(13)	⟨11⟩														
1188.91(11)	10^-														
1205.28(12)															
1212.26(9)	11^+														
1216.0(3)	9^-														
1241.32(14)	10^-														
1247(3)															
1252.32(11)															
1270.42(21)															
1280.31(14)	⟨9⟩							≤9 ps							
1293.34(22)															
1309.77(10)	14^-														
1326.73(9)	11^+														
1339.01(8)	11^-												94(17)		
1353.84(24)															
1363.9(8)	9^+														
1389.51(21)															
1401.30(9)	13^+														
1427(4)															
1435.97(12)	11^+														
1447.33(14)	11^-														
1452.40(18)	15^-							31.0(14) μs							
1463.64(22)															
1478.73(12)	11^-														
1490.13(10)	12^+														
1500.98(23)	⟨10⟩														
1541.71(13)															
1546.63(18)	⟨12⟩														
1573.44(22)															
1579.9(8)	⟨12⟩														
1597.37(9)	13^-							≤2.4 ns							
1616.17(12)	12^+														
1618.94(11)	15^-														
1630(30)															
1630.71(13)	12^+														
1671.52(12)	⟨12⟩														
1699.07(16)	12^-														

(continued) **$^{180}_{73}$Ta**

E^* [keV]	J^π	L (α,t)	L (p,d)	C^2S (p,d)	I_d	L (d,t)	C^2S (d,t)	$T_{1/2}$ orRef. Γ_{cm}	Branching ratios in percentage E_f^*: 0.0 J_f^π: 1^+	39.7 2^+	77.1 9^-	108 0^-	111 3^+
1707.80(11)	$11^{\langle+\rangle}$							<1 ns					
1715.11(11)	14^+												
1737.64(17)	$\langle 11\rangle$												
1740(3)													
1773.0(10)	12^+												
1788.17(11)	13^+												
1790.49(15)	12^-												
1792.28(20)	16^-												
1805.78(12)	$\langle 13\rangle$												
1822(3)													
1841.32(12)	$\langle 13^-\rangle$												
1863.4(3)													
1866(3)													
1880.03(11)	14^-												
1904.15(11)													
1904.43(13)	13												
1924.66(13)	13^+												
1930(30)													
1941.55(13)	$14^{\langle+\rangle}$							<1 ns					
1941.90(18)	13^-												
1947.10(12)	16^-												
1968.65(14)	13^+												
1970.50(15)	$12^{\langle+\rangle}$												
2005.84(22)													
2049.96(13)	15^+												
2071.17(22)													
2105.06(12)	14^+												
2123.31(20)	13^-												
2124.84(22)	$\langle 14\rangle$												
2157.33(20)	17^-												
2160.0(4)													
2182.65(12)	15^-												
2186.5(4)	14												
2198.61(17)	14^+												
2237(20)													
2258.85(24)	$13^{\langle+\rangle}$												
2294.30(15)	17^-												
2321.01(16)	$15^{\langle+\rangle}$												
2328.0(7)	$\langle 16^+\rangle$												
2341.75(25)													
2354.43(23)													
2402.16(13)	16^+												
2409.80(13)	16^+												
2438.29(14)	15^+												
2452.2(4)													

(continued) **$^{180}_{73}$Ta**

E^* [keV]	J^π	L (α,t)	L (p,d)	C^2S (p,d)	I_d	L (d,t)	C^2S (d,t)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage E_f^*: 0.0 39.7 77.1 108 111 J_f^π: 1^+ 2^+ 9^- 0^- 3^+
2480(60)										
2504.14(13)	16^-									
2545.37(21)	18^-									
2560.89(25)										
2568.75(18)	15^+									
2588.37(22)	$18^{\langle+\rangle}$							22(2) ns		
2658.10(15)	18^-									
2660.20(13)	17^+									
2672.52(22)	$17^{\langle+\rangle}$									
2720(30)										
2721.47(18)	$16^{\langle+\rangle}$									
2780.06(17)	17^+									
2787.55(15)	16^+									
2843.7(4)	16^+									
2844.24(15)	17^-									
2880(40)										
2899.89(23)	19^-							<2 ns		
2943.38(14)	18^+									
2954.62(21)	19^-									
2985.56(23)	$19^{\langle+\rangle}$									
3041.51(18)	19^-									
3048.19(22)	$\langle 18^+\rangle$									
3141.67(21)	$17^{\langle+\rangle}$									
3148.1(4)	17^+									
3173.0(4)										
3175(4)	18^+									
3200.8(5)	18^-									
3253.07(16)	19^+									
3309.22(25)	20^-									
3383.93(23)	20^-									
3400.63(24)	$20^{\langle+\rangle}$									
3435.5(4)	20^-									
3436.0(12)	$\langle 19^+\rangle$									
3532.79(25)										
3584.4(14)	$\langle 19^+\rangle$									
3679.0(11)	$\langle 22^-\rangle$							2.0(5) μs		
3738.5(3)	21^-									
3828.73(25)	21^-									
3832.3(3)	$21^{\langle+\rangle}$									
3855.4(5)	21^-									
4171.0(15)										
4171.0+X	$\langle 23$–$25\rangle$							17(5) μs		

(continued) **$^{180}_{73}$Ta**

E^*	J^π	L	L	C^2S	I_d	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
										E_f^*:	0.0	39.7	77.1	108	111
[keV]		(α,t)	(p,d)	(p,d)		(d,t)	(d,t)	Γ_{cm}		J_f^π:	1^+	2^+	9^-	0^-	3^+
4186.8(3)	22^-														
		02We01		83Wa01			83De43		Ref.						

Additional data on this isotope can be found in [05De38, 03Lo01, 02We01, 00Wh04, 94DeZU].
* 9/2[624] neutron transferred [83Wa01, 03Wu10];
** 5/2[512] neutron transferred [83Wa01, 03Wu10];
*** 7/2[514] neutron transferred [83Wa01, 03Wu10];
**** 1/2[510] neutron transferred [83Wa01, 03Wu10];
Values I_d are given as counts at ° [02We01].
Levels at 722, 788, 836 and 908 keV correspond to 1/2[521] neutron transfer;
levels at 809 and 876 keV correspond to 3/2[512] neutron transfer [83Wa01].
Parameter C^2S=$(1/N)(\sigma(exp)/\sigma(DWBA)$ with N=2.29 was introduced in [83Wa01].
Parameter C^2S=$(1/N)(\sigma(exp)/\sigma(DWBA)$ with N=1.33 was introduced in [83De43].
Photo-induced depopulation of the $^{180}Ta^m$ isomer via 9 low-lying intermediate states is discussed in [99Be65,02Be18].
Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [03Wu10]. Part 2 **$^{180}_{73}$Ta**

E^*	J^π					Branching ratios in percentage						
		E_f^*:	130	171.28	177.65	185.03	234.48	280.03	310.97	318.35	320.46	356.68
[keV]		J_f^π:	1^-	2^-	8^+	4^+	3^-	10^-	5^+	4^-	1^+	7^+
171.28(6)	2^-		88(16)									
234.48(6)	3^-			100								
311.0(1)*	5^+					80(12)						
318.35(6)	4^-						100					
356.68(6)	7^+				100							
370.98(5)	2^+										0.8(2)	
373.7(1)*	9^+				100							
416.4(1)*	6^+					31(2)			69(5)			
420.00(7)	5^-						13.5(21)			87(6)		
423.6(1)**	1^-		≤1.9	29(7)								
448.00(6)	3^+					20(2)						
463.2(1)***	7^-				100							
478.2(1)**	2^-		14(1)	4(1)			12(1)					
505.21(7)	11^-							81(2)				
515.56(5)	8^+				77(3)							18(7)
520.14(8)	4^+					12.0(12)			10.2(9)			
544.4(1)**	3^-			58(3)			3(1)			8(1)		
547.79(8)	6^-									9(4)		
548.01(9)	4^+								17			
549.5(1)****	3^-			100								
559.63(5)	2^+		≤8								7	

(continued) **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	130	171.28	177.65	185.03	234.48	280.03	310.97	318.35	320.46	356.68
[keV]	J_f^π:	1^-	2^-	8^+	4^+	3^-	10^-	5^+	4^-	1^+	7^+
574.5(1)**	6^-										53(6)
575.57(6)	8^+			64(3)							36(10)
595.0(1)*	10^+			59(2)							
600.4(1)*	7^+							26(11)			
624.27(6)	3^+									24	
645.8(1)****	$\langle 4^- \rangle$					50					
653.67(6)	1^-									25	
663.9(1)****	$\langle 4^- \rangle$					≈41					
676.47(10)	5^+				x						
684.1(3)	$\langle 6 \rangle$										100
708.29(6)	2^-									28	
723.23(7)	9^+			3.1(8)							6.5(7)
731.31(9)			65						35		
752.33(8)	12^-						36.2(10)				
784.5(1)****	$\langle 5^- \rangle$					65			35		
806.63(6)	9^+			6(2)							10(1)
830.34(9)	$\langle 6 \rangle$										54(8)
876.97(6)	$\langle 2^- \rangle$		x							12	
891.56(11)	$\langle 7 \rangle$										7
917.00(7)	7									61	
935.25(8)										41	
951.68(7)										33	
1034.7(10)	$\langle 7 \rangle$										100
1037.22(8)										54	
1174.94(13)	$\langle 11 \rangle$						100				
1293.34(22)							100				
1339.01(8)	11^-						6.0(8)				
1463.64(22)							100				
1546.63(18)	$\langle 12 \rangle$						74(10)				
1573.44(22)							100				
1579.9(8)	$\langle 12 \rangle$						100				
1671.52(12)	$\langle 12 \rangle$						48(7)				

Energy levels and branching ratios [03Wu10]. Part 3 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	370.98	373.72	416.40	420.00	423.61	448.00	463.24	478.24	505.21	515.56
[keV]	J_f^π:	2^+	9^+	6^+	5^-	1^-	3^+	7^-	2^-	11^-	8^+
478.2(1)**	2^-					41(5)					
520.14(8)	4^+						x				
544.4(1)**	3^-					≈1			30(5)		
547.79(8)	6^-				91(4)						

(continued) **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	370.98	373.72	416.40	420.00	423.61	448.00	463.24	478.24	505.21	515.56
[keV]	J_f^π:	2^+	9^+	6^+	5^-	1^-	3^+	7^-	2^-	11^-	8^+
549.5(1)****	3^-								x		
559.63(5)	2^+	1									
574.5(1)**	6^-							47(18)			
595.0(1)*	10^+		40.6(14)								
600.4(1)*	7^+			74(3)							
624.27(6)	3^+	30					8				
653.67(6)	1^-	13				49			14		
680.4(1)***	8^-							100			
686.00(9)	7^-				7.8(8)						
708.29(6)	2^-	7				47	15				
723.23(7)	9^+		16.0(9)								73(3)
735.33(10)	8^+			54(3)							
752.33(8)	12^-									64(2)	
763.3(1)**	7^-							59(5)			
788.10(10)	$\langle 3^- \rangle$	100									
788.54(11)	3^-								100		
806.63(6)	9^+		32(2)								8(1)
830.34(9)	$\langle 6 \rangle$							≈3			
840.49(8)	11^+		82(2)								
876.97(6)	$\langle 2^- \rangle$					78			10		
880.80(7)						31					
917.00(7)	7	13				26					
922.43(10)	9^-							44(3)			
935.25(8)									59		
951.68(7)		35				31					
956.09(8)	10^+		5.0(9)								25.9(13)
976.3(1)**	8^-							x			
996.64(9)		62					38				
1020.70(9)	13^-									48(2)	
1037.22(8)		46									
1113.24(9)		39					61				
1252.32(11)			100								
1270.42(21)			100								
1389.51(21)										100	
1546.63(18)	$\langle 12 \rangle$									26(6)	
1597.37(9)	13^-									55(2)	
1707.80(11)	$11^{\langle + \rangle}$		100								
1805.78(12)	$\langle 13 \rangle$									87(7)	
1841.32(12)	$\langle 13^- \rangle$									≈50	
1863.4(3)										100	

Energy levels and branching ratios [03Wu10]. Part 4

$^{180}_{73}$Ta

E^*	J^π		Branching ratios in percentage									
		E_f^*:	520.14	544.36	547.79	548.01	549.48	559.63	574.51	575.57	594.43	594.99
[keV]		J_f^π:	4^+	3^-	6^-	4^+	3^-	2^+	6^-	8^+	$\langle 5\rangle$	10^+
594.43(16)	$\langle 5\rangle$		x									
624.27(6)	3^+							x				
641.65(11)	5^+		100									
645.8(1)****	$\langle 4^-\rangle$			50								
658.5(1)**	$\langle 4^-\rangle$			100								
663.9(1)****	$\langle 4^-\rangle$						59					
672.15(13)	$\langle 4\rangle$		100									
676.47(10)	5^+					x						
686.00(9)	7^-				92(4)							
708.29(6)	2^-						≈3					
722.02(7)	4^-			83			≈17					
723.23(7)	9^+									1.0(3)		
729.75(11)			99									
735.10(15)	$\langle 6\rangle$										100	
738.65(12)	$\langle 5\rangle$		83									
756.44(10)									100			
763.3(1)**	7^-								41(17)			
787.33(11)	$\langle 6^+\rangle$		15(9)									
806.63(6)	9^+									43(2)		
809.54(13)	$\langle 5^-\rangle$		100									
809.55(10)	$\langle 5^-\rangle$			50								
830.34(9)	$\langle 6\rangle$								44(8)			
835.81(12)	5^-								100			
840.49(8)	11^+											17.7(7)
857.20(13)	8^-				15(7)							
864.01(12)			100									
865.51(12)									100			
880.80(7)								25				
891.56(11)	$\langle 7\rangle$								93			
896.86(12)	$\langle 7\rangle$											22(3)
906.07(10)	$\langle 7\rangle$								91			
976.3(1)**	8^-								55(17)			
991.75(12)			34									
1043.24(13)			100									
1056.86(7)	10^+									18(2)		17(2)
1109.63(9)	12^+											87(3)
1205.28(12)			62									

Energy levels and branching ratios [03Wu10]. Part 5 **$^{180}_{73}$Ta**

E^*	J^π		Branching ratios in percentage									
		E_f^*:	600.41	624.27	641.65	658.53	672.15	680.37	680.5	686.00	722.02	723.23
[keV]		J_f^π:	7^+	3^+	5^+	$\langle 4^-\rangle$	$\langle 4\rangle$	8^-		7^-	4^-	9^+
729.75(11)					≈1							
735.33(10)	8^+		46(8)									
738.65(12)	$\langle 5\rangle$				17							
787.33(11)	$\langle 6^+\rangle$				85(5)							
792.65(17)	$\langle 5\rangle$						100					
809.55(10)	$\langle 5^-\rangle$					50						
857.20(13)	8^-									85(3)		
862.02(20)	$\langle 7\rangle$							100				
880.80(7)				44								
884.25(13)					100							
892.92(12)											100	
907.51(10)	4^-										79	
922.43(10)	9^-								56(3)			
956.09(8)	10^+											69(3)
956.65(12)	7^+				31(5)							
976.3(1)**	8^-								45(14)			
977.18(11)	9^+		26.5(16)									
991.75(12)					66							
1030.68(13)	9^-									17(6)		
1056.86(7)	10^+											6(2)
1100.85(15)					100							
1188.91(11)	10^-							58(3)				
1212.26(9)	11^+											49(12)

Energy levels and branching ratios [03Wu10]. Part 6 **$^{180}_{73}$Ta**

E^*	J^π		Branching ratios in percentage									
		E_f^*:	729.75	735.10	735.33	738.65	752.33	756.44	763.26	787.33	788.10	792.65
[keV]		J_f^π:		$\langle 6\rangle$	8^+	$\langle 5\rangle$	12^-		7^-	$\langle 6^+\rangle$	$\langle 3^-\rangle$	$\langle 5\rangle$
884.25(13)			x									
893.15(15)	$\langle 6\rangle$					100						
896.86(12)	$\langle 7\rangle$				78(5)							
906.07(10)	$\langle 7\rangle$							≈9				
907.51(10)	4^-										21	
938.95(19)	$\langle 6\rangle$											100
956.65(12)	7^+									69(4)		
976.3(1)**	8^-								x			
977.18(11)	9^+				74(3)							
1020.70(9)	13^-						52(2)					
1079.23(14)	$\langle 8\rangle$			50(24)								
1141.22(12)	10^+				62(2)							
1149.60(14)	8^+									55(5)		

(continued) **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage										
	E_f^*:	729.75	735.10	735.33	738.65	752.33	756.44	763.26	787.33	788.10	792.65	
[keV]	J_f^π:		⟨6⟩	8^+	⟨5⟩	12^-		7^-	$\langle 6^+\rangle$	$\langle 3^-\rangle$	⟨5⟩	
1216.0(3)	9^-							100				
1309.77(10)	14^-					57(2)						
1597.37(9)	13^-					18.3(8)						
1805.78(12)	⟨13⟩					13(4)						
1841.32(12)	$\langle 13^-\rangle$					≈50						
2124.84(22)	⟨14⟩					100						
2160.0(4)						100						

Energy levels and branching ratios [03Wu10]. Part 7 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage										
	E_f^*:	806.63	830.34	840.49	857.20	864.01	884.25	896.86	922.43	956.09	956.65	
[keV]	J_f^π:	9^+	⟨6⟩	11^+	8^-			⟨7⟩	9^-	10^+	7^+	
1016.3(3)	⟨7⟩		100									
1030.68(13)	9^-				83(2)							
1053.8(10)							100					
1056.86(7)	10^+	58(3)										
1079.23(14)	⟨8⟩							50(4)				
1109.63(9)	12^+			13.3(6)								
1149.60(14)	8^+										45(15)	
1188.91(11)	10^-								42(16)			
1205.28(12)						≈38						
1212.26(9)	11^+									51(2)		
1241.32(14)	10^-				15(5)							
1280.31(14)	⟨9⟩							54(5)				
1326.73(9)	11^+	47(4)										
1363.9(8)	9^+										57	
1401.30(9)	13^+			90(3)								
1478.73(12)	11^-								75(6)			
1490.13(10)	12^+									58(3)		
1904.15(11)				55(5)								

Energy levels and branching ratios [03Wu10]. Part 8 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	977.18	1016.3	1020.70	1030.68	1056.86	1079.23	1109.63	1141.22	1149.60	1174.94
[keV]	J_f^π:	9^+	⟨7⟩	13^-	9^-	10^+	⟨8⟩	12^+	10^+	8^+	⟨11⟩
1141.22(12)	10^+	38(2)									
1241.32(14)	10^-				85(3)						

(continued) **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	977.18	1016.3	1020.70	1030.68	1056.86	1079.23	1109.63	1141.22	1149.60	1174.94
[keV]	J_f^π:	9^+	$\langle 7\rangle$	13^-	9^-	10^+	$\langle 8\rangle$	12^+	10^+	8^+	$\langle 11\rangle$
1280.31(14)	$\langle 9\rangle$						46(4)				
1309.77(10)	14^-			42.8(14)							
1326.73(9)	11^+					53(3)					
1353.84(24)											100
1363.9(8)	9^+									≈43	
1401.30(9)	13^+							9.6(7)			
1435.97(12)	11^+	40(2)							60(3)		
1447.33(14)	11^-				19(2)						
1452.40(18)	15^-			93							
1500.98(23)	$\langle 10\rangle$						64(8)				
1616.17(12)	12^+					40(6)					
1618.94(11)	15^-			67(2)							
1630.71(13)	12^+								67(3)		
1715.11(11)	14^+							94(3)			
1904.15(11)								7(3)			
2005.84(22)								100			
2452.2(4)			100								

Energy levels and branching ratios [03Wu10]. Part 9 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	1188.91	1212.26	1241.32	1280.31	1309.77	1326.73	1339.01	1401.30	1435.97	1447.33
[keV]	J_f^π:	10^-	11^+	10^-	$\langle 9\rangle$	14^-	11^+	11^-	13^+	11^+	11^-
1447.33(14)	11^-			81(3)							
1452.40(18)	15^-					7.0(17)					
1478.73(12)	11^-	25(4)									
1490.13(10)	12^+		42(2)								
1500.98(23)	$\langle 10\rangle$				36(5)						
1541.71(13)								100			
1597.37(9)	13^-							26.5(11)			
1616.17(12)	12^+						60(5)				
1618.94(11)	15^-					33.0(12)					
1630.71(13)	12^+									33(2)	
1671.52(12)	$\langle 12\rangle$							52(6)			
1699.07(16)	12^-			20.9(17)							79(3)
1715.11(11)	14^+								5.8(5)		
1737.64(17)	$\langle 11\rangle$				82(11)						
1773.0(10)	12^+									100	
1788.17(11)	13^+		73(4)								
1790.49(15)	12^-	88(7)									
1904.15(11)									38(3)		
1924.66(13)	13^+						79(6)				

(continued) **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	1188.91	1212.26	1241.32	1280.31	1309.77	1326.73	1339.01	1401.30	1435.97	1447.33
[keV]	J_f^π:	10^-	11^+	10^-	$\langle 9\rangle$	14^-	11^+	11^-	13^+	11^+	11^-
1941.90(18)	13^-										4.0(23)
1947.10(12)	16^-					71(3)					
1968.65(14)	13^+									48(5)	
2049.96(13)	15^+								100		

Energy levels and branching ratios [03Wu10]. Part 10 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	1452.40	1478.73	1490.13	1500.98	1579.9	1597.37	1616.17	1618.94	1630.71	1699.07
[keV]	J_f^π:	15^-	11^-	12^+	$\langle 10\rangle$	$\langle 12\rangle$	13^-	12^+	15^-	12^+	12^-
1737.64(17)	$\langle 11\rangle$				18(7)						
1788.17(11)	13^+			27.5(18)							
1790.49(15)	12^-		12(4)								
1792.28(20)	16^-	100									
1880.03(11)	14^-						100				
1904.43(13)	13					≈54	46				
1924.66(13)	13^+							21(4)			
1941.55(13)	$14^{\langle +\rangle}$						100				
1941.90(18)	13^-										96(4)
1947.10(12)	16^-								29.5(13)		
1968.65(14)	13^+									52(6)	
2071.17(22)							100				
2105.06(12)	14^+			80(4)							
2123.31(20)	13^-		≈67								
2157.33(20)	17^-	7(5)									
2182.65(12)	15^-						38(4)				
2198.61(17)	14^+									100	
2294.30(15)	17^-								75(3)		
2328.0(7)	$\langle 16^+\rangle$	100									
2588.37(22)	$18^{\langle +\rangle}$	7									

Energy levels and branching ratios [03Wu10]. Part 11 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	1707.80	1715.11	1788.17	1790.49	1792.28	1880.03	1904.15	1941.55	1947.10	1968.65
[keV]	J_f^π:	$11^{\langle +\rangle}$	14^+	13^+	12^-	16^-	14^-		$14^{\langle +\rangle}$	16^-	13^+
1970.50(15)	$12^{\langle +\rangle}$	100									
2105.06(12)	14^+			20(2)							
2123.31(20)	13^-			≈33							

(continued) **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage										
	E_f^*:	1707.80	1715.11	1788.17	1790.49	1792.28	1880.03	1904.15	1941.55	1947.10	1968.65
[keV]	J_f^π:	$11^{\langle+\rangle}$	14^+	13^+	12^-	16^-	14^-		$14^{\langle+\rangle}$	16^-	13^+
2157.33(20)	17^-					93(3)					
2182.65(12)	15^-						62(4)				
2186.5(4)	14							100			
2258.85(24)	$13^{\langle+\rangle}$	22(17)									78(17)
2294.30(15)	17^-									25.3(17)	
2321.01(16)	$15^{\langle+\rangle}$								100		
2341.75(25)											100
2354.43(23)							100				
2402.16(13)	16^+		100								
2409.80(13)	16^+		100								
2438.29(14)	15^+			72(7)							
2504.14(13)	16^-						60(5)				
2545.37(21)	18^-					14.5(19)					
2560.89(25)					100						
2568.75(18)	15^+										100
2658.10(15)	18^-									78(4)	
2672.52(22)	$17^{\langle+\rangle}$					94(8)					

Energy levels and branching ratios [03Wu10]. Part 12 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	2049.96	2105.06	2157.33	2182.65	2198.61	2294.30	2321.01	2328.0	2402.16	2409.80
[keV]	J_f^π:	15^+	14^+	17^-	15^-	14^+	17^-	$15^{\langle+\rangle}$	$\langle16^+\rangle$	16^+	16^+
2438.29(14)	15^+		28(5)								
2504.14(13)	16^-				40(4)						
2545.37(21)	18^-			85(3)							
2588.37(22)	$18^{\langle+\rangle}$			93							
2658.10(15)	18^-						22(3)				
2660.20(13)	17^+	23(3)								39(3)	38(3)
2672.52(22)	$17^{\langle+\rangle}$								6(3)		
2721.47(18)	$16^{\langle+\rangle}$							100			
2780.06(17)	17^+	100									
2787.55(15)	16^+		82(10)								
2843.7(4)	16^+					100					
2844.24(15)	17^-				79(10)						
2899.89(23)	19^-			5.2(21)							
2943.38(14)	18^+									36(4)	40(4)
2954.62(21)	19^-			27(4)							
3041.51(18)	19^-						100				
3048.19(22)	$\langle18^+\rangle$			67(11)							
3173.0(4)										100	
3175(4)	18^+										100

Energy levels and branching ratios [03Wu10]. Part 13 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	2438.29	2504.14	2545.37	2588.37	2658.10	2660.20	2672.52	2721.47	2780.06	2787.55
[keV]	J_f^π:	15^+	16^-	18^-	$18^{\langle+\rangle}$	18^-	17^+	$17^{\langle+\rangle}$	$16^{\langle+\rangle}$	17^+	16^+
2787.55(15)	16^+	18(10)									
2844.24(15)	17^-		21(9)								
2899.89(23)	19^-			10.2(16)	85(4)						
2943.38(14)	18^+						23(4)				
2954.62(21)	19^-			73(5)							
2985.56(23)	$19^{\langle+\rangle}$				100						
3048.19(22)	$\langle 18^+\rangle$							33(6)			
3141.67(21)	$17^{\langle+\rangle}$								100		
3148.1(4)	17^+	66(17)									34(14)
3200.8(5)	18^-		100								
3253.07(16)	19^+						58(8)				
3383.93(23)	20^-			40(6)							
3400.63(24)	$20^{\langle+\rangle}$				46(5)						
3435.5(4)	20^-					100					
3436.0(12)	$\langle 19^+\rangle$			100							
3584.4(14)	$\langle 19^+\rangle$									100	

Energy levels and branching ratios [03Wu10]. Part 14 **$^{180}_{73}$Ta**

E^*	J^π	Branching ratios in percentage										
	E_f^*:	2899.89	2943.38	2954.62	2985.56	3041.51	3309.22	3383.93	3400.63	3679.0	3738.5	4171.0
[keV]	J_f^π:	19^-	18^+	19^-	$19^{\langle+\rangle}$	19^-	20^-	20^-	$20^{\langle+\rangle}$	$\langle 22^-\rangle$	21^-	
3253.07(16)	19^+		42(8)									
3309.22(25)	20^-	100										
3383.93(23)	20^-			60(8)								
3400.63(24)	$20^{\langle+\rangle}$				54(5)							
3532.79(25)		100										
3679.0(11)	$\langle 22^-\rangle$						100					
3738.5(3)	21^-						100					
3828.73(25)	21^-							100				
3832.3(3)	$21^{\langle+\rangle}$				68(9)				32(9)			
3855.4(5)	21^-					100						
4171.0(15)										x		
4171.0+X	$\langle 23–25\rangle$											x
4186.8(3)	22^-										100	

Energy levels and branching ratios [05Wu06, 91Fi01].

$^{181}_{73}$Ta

E^*	$2J^\pi$	$I_{s,0}$	$g\Gamma_\circ$	$g\Gamma_\circ^{red}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*:	0.0	6.2	136	158	302
[keV]		[eVb]	[meV]	[meV′]	Γ_{cm}		$2J_f^\pi$:	7^+	9^-	9^+	$\langle 11\rangle^-$	11^+
0.0	7^+				Stable							
6.238(20)	9^-				6.05(12) μs			100				
136.26(1)	9^+				39.5(16) ps			100				
158.55(2)	11^-								100			
301.62(2)	11^+				16(3) ps			41(2)		59(3)		
337.54(3)	13^-								x		x	
482.17(2)	5^+				10.8(1) ns			83.6(1)	0.730(6)	15.7(1)		
495.18(2)	13^+				6.3(8) ps					60(3)		40(2)
542.51(3)	15^-										x	
615.19(3)	1^+				18(1) μs			0.54(4)				
618.99(5)	3^+				0.87(2) ns			2.83(14)				
716.66(3)	15^+				3.0(4) ps							70(4)
727.3(2)	9^+											
772.97(4)	17^-											
892.9(3)	11^+											
964.99(4)	17^+				1.93(24) ps							
993.7(3)												
994.2(10)	$\langle 5^-\rangle$											
1022.6(10)	$\langle 9^-\rangle$											
1027.94(5)	19^-											
1085.6(3)	13^+											
1156.6(5)												
1163.6(15)	$\langle 13^-\rangle$											
1205.7(6)	$\langle 3^+\rangle$											
1233.1												
1239.47(5)	19^+				1.12(14) ps							
1278.1(6)	$\langle 5^+\rangle$											
1304.8(4)	15^+											
1307.11(5)	21^-											
1340(15)												
1380.1(5)	$\langle 7^+\rangle$											
1380.6(6)	$\langle 11^+\rangle$											
1390												
1403.2(8)	15^-										x	
1403.4(2)	$\langle 17\rangle$											
1403.9(2)	$\langle 15\rangle$											
1419.6(2)	$\langle 17^-\rangle$											
1472.7												
1483.4(2)	21^-											
1507.9(7)	$\langle 9^+\rangle$											
1539.3(1)	21^+				0.76(10) ps							
1548.4(4)	17^+											
1563.4(7)	$\langle 13^+\rangle$											
1583.8(10)	$\langle 17\rangle$											
1591.9(4)	$\langle 19\rangle$											

(continued) **$^{181}_{73}$Ta**

E^*	$2J^\pi$	$I_{s,0}$	$g\Gamma_\circ$	$g\Gamma_\circ^{red}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
							E_f^*:	0.0	6.2	136	158	302
[keV]		[eVb]	[meV]	[meV′]	Γ_{cm}		$2J_f^\pi$:	7^+	9^-	9^+	$\langle 11\rangle^-$	11^+
1608.9(2)	23^-											
1661.1												
1664.9(7)	$\langle 11^+\rangle$											
1685.3(5)	$\langle 19\rangle$											
1771.9(7)	$\langle 15^+\rangle$											
1776.3(9)	23^-											
1786.6(20)	$\langle 21^-\rangle$											
1787.6(10)	$\langle 19\rangle$											
1803.7(5)	$\langle 21\rangle$											
1819.1(4)	$\langle 19^+\rangle$											
1863.1(2)	23^+											
1932.8(2)	25^-											
1866(1)		5.43(86)	4.92(78)	0.76(12)		98Wo06						
1932.8(2)	25^-											
1935(1)		4.23(64)	4.12(63)	0.57(9)		98Wo06						
2001.2(10)	$\langle 17^+\rangle$											
2014.7(12)	$\langle 21\rangle$											
2020												
2097(1)		2.21(52)	2.53(60)	0.27(6)		98Wo06						
2098.1(11)												
2105(1)		3.65(68)	4.21(79)	0.45(8)		98Wo06						
2122.5(5)	$\langle 21^+\rangle$											
2210.1(3)	25^+											
2227.9(9)					210(20) μs							
2240(1)		2.15(49)	2.81(64)	0.25(6)		98Wo06						
2253(1)		2.88(53)	3.81(71)	0.33(6)		98Wo06						
2260.6(23)	$\langle 25^-\rangle$											
2262.6(13)	$\langle 23\rangle$											
2272(1)		3.62(59)	4.86(79)	0.41(7)		98Wo06						
2276.3(8)	27^-											
2289(1)												
2297.1(7)		23.6(25)	39.0(39)	3.22(32)		98Wo06						
2361.4												
2400.1(7)		2.41(45)	7.65(118)	0.55(9)		98Wo06						
2418.1(7)												
2448.1(7)		5.45(72)	11.9(15)	0.81(10)		98Wo06						
2519(1)		2.40(43)	3.96(71)	0.25(4)		98Wo06						
2525.7												
2533.7(15)	$\langle 25\rangle$											
2570												
2580.1(4)	27^+											
2642.8(11)	29^-											
2761(1)		1.64(35)	3.25(70)	0.15(3)		98Wo06						
2800(1)												
2807(1)		3.76(53)	7.71(108)	0.35(5)		98Wo06						

(continued) **$^{181}_{73}$Ta**

E^*	$2J^\pi$	$I_{s,0}$	$g\Gamma_\circ$	$g\Gamma_\circ^{red}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*:	0.0	6.2	136	158	302
[keV]		[eVb]	[meV]	[meV′]	Γ_{cm}		$2J_f^\pi$:	7^+	9^-	9^+	$\langle 11\rangle^-$	11^+
2812(1)		3.07(46)	6.32(95)	0.28(4)		98Wo06						
2835(1)												
2845(1)		1.57(35)	3.31(73)	0.14(3)		98Wo06						
2890												
2892(1)		1.68(35)	3.66(77)	0.15(3)		98Wo06						
2898(1)		3.14(46)	6.86(100)	0.28(4)		98Wo06						
2929(1)		1.50(34)	3.35(75)	0.13(3)		98Wo06						
2967(1)		3.02(42)	6.92(96)	0.26(4)		98Wo06						
2968.1(11)	29^+											
3010												
3016(1)		1.34(31)	3.17(73)	0.12(3)	0.78 ps	98Wo06						
3021.3(13)	31^-											
3023(1)		4.65(56)	11.1(13)	0.40(5)		98Wo06						
3029(1)		4.06(51)	9.70(123)	0.35(4)		98Wo06						
3035(1)												
3054.1(7)		1.24(29)	6.55(113)	0.23(4)		98Wo06						
3065(1)		2.88(41)	7.04(101)	0.24(4)		98Wo06						
3074.2(7)		1.43(31)	8.49(137)	0.29(5)		98Wo06						
3081(1)		8.99(95)	22.2(23)	0.76(8)		98Wo06						
3086(1)		2.37(38)	5.87(94)	0.20(3)		98Wo06						
3092(1)		1.46(31)	3.63(78)	0.12(3)		98Wo06						
3108.1(7)		2.58(40)	12.2(16)	0.41(5)		98Wo06						
3320(1)		2.99(44)	8.58(126)	0.23(3)		98Wo06						
3329(1)		3.17(45)	9.14(129)	0.25(4)		98Wo06						
3407(1)		2.13(37)	6.44(111)	0.16(3)		98Wo06						
6417.7(7)					1.7 ps							
6759					25 ps							
		98Wo06	98Wo06	98Wo06		Ref.						

Additional data on this isotope can be found in [01Ol03].
Abundance: 99.988(2) %.
9 bands (A-I) are assigned to excited states of ^{180}Ta in [05Wu06], see branchings therein.
Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [05Wu06, 91Fi01]. Part 2 **$^{181}_{73}$Ta**

E^*	$2J^\pi$	Branching ratios in percentage								
	E_f^*:	338	482	495.19	542.51	615.21	716.67	772.97	964.97	1403.40
[keV]	$2J_f^\pi$:	$\langle 13^-\rangle$	5^+	13^+	$\langle 15^-\rangle$	1^+	15^+	$\langle 17^-\rangle$	17^+	
542.51(3)	15^-	x								
615.19(3)	1^+		99.5(11)							
618.99(5)	3^+		97(20)			x				
716.66(3)	15^+			30(2)						

(continued) **$^{181}_{73}$Ta**

E^*	$2J^\pi$		Branching ratios in percentage								
		E_f^*:	338	482	495.19	542.51	615.21	716.67	772.97	964.97	1403.40
[keV]		$2J_f^\pi$:	$\langle 13^- \rangle$	5^+	13^+	$\langle 15^- \rangle$	1^+	15^+	$\langle 17^- \rangle$	17^+	
772.97(4)	17^-		x			x					
964.99(4)	17^+				76(7)			24(2)			
1027.94(5)	19^-					x			x		
1239.47(5)	19^+							83(19)		17(4)	
1307.11(5)	21^-								x		
1403.2(8)	15^-		x			x					
1539.3(1)	21^+									x	
1563.4(7)	$\langle 13^+ \rangle$										x

Energy levels and branching ratios [95Si04]. **$^{182}_{73}$Ta**

E^*	J^π	$T_{1/2}$ or		Branching ratios in percentage						
			E_f^*:	0.0	16.3	97.8	114.3	150.1	163.0	173.2
[keV]		Γ_{cm}	J_f^π:	3^-	5^+	4^-	4^-	4^+	6^+	5^-
0.0	3^-	114.43(3) d								
16.263(3)	5^+	283(3) ms		100						
97.832(2)	4^-			100						
114.315(2)	4^-			100						
150.140(3)	4^+			1.3(2)	99(11)					
163.039(4)	6^+	<30 ps			100					
173.243(2)	5^-					61(35)	39(5)			
237.288(2)	5^-			12(1)		57(5)	31(3)			
249.971(3)	$\langle 3 \rangle^+$			1.9(2)	18(1)			80(6)		
269.035(3)	$\langle 5^+ \rangle$				13(1)			81(7)	6(2)	
270.403(2)	2^-	1.2(2) ns		91(5)		0.34(6)	8.9(8)			
292.941(2)	5^-					36(3)	44(3)			21(3)
316.399(7)	6^-					2.9(4)				97(9)
334.619(5)	7^+	<30 ps			12(1)				88(4)	
360.519(3)	$\langle 3 \rangle^-$			67(4)		1.9(4)	12(1)			
364.347(3)	4^+				9.5(7)			23(1)		
390.144(7)	$\langle 4\text{–}6 \rangle^+$				89(4)				11(2)	
396.337(3)	$\langle 6^- \rangle$					11(1)	8(1)		19(6)	
402.623(4)	2^+	1.00(5) ns		99(6)						
411.296(7)	$\langle 6^+ \rangle$				13(3)			7(2)	7(2)	
443.607(3)	1^-	2.2(2) ns		3.0(2)						
475.555(6)	$\langle 3 \rangle^+$									
480.035(3)	4^-			26(4)		30(1)	2.6(5)			2.9(5)
488.266(4)	$\langle 6^- \rangle$					11(2)				19(2)
491.424(3)	2^-			10(3)						
505.591(4)	5^+							7.3(7)	3.9(9)	4.2(11)
519.57(2)	10^-	15.8(1) m							1.2(1)	
547.096(3)	$\langle 3 \rangle^-$			2.2(3)			0.9(3)	7.8(3)		

(continued) **$^{182}_{73}$Ta**

E^*	J^π	$T_{1/2}$ or		Branching ratios in percentage						
			E_f^*:	0.0	16.3	97.8	114.3	150.1	163.0	173.2
[keV]		Γ_{cm}	J_f^π:	3^-	5^+	4^-	4^-	4^+	6^+	5^-
558.285(3)	$\langle 1\rangle^-$			6.5(13)						
565.690(3)	$\langle 3\rangle^-$									
571.635(6)	4^+					65(7)				
579.428(6)	$\langle 7^+\rangle$				17(5)				8(1)	
581.198(11)	$\langle 7^-\rangle$									
583.269(4)	$\langle 0^-\rangle$									
592.957(4)	$\langle 1^+\rangle$									
628.425(4)	5^-					32(2)	11(3)			
647.428(5)	$\langle 2^+\rangle$			38(3)						
647.649(3)	$\langle 2\rangle^-$					4(1)				
651.210(3)	$\langle 4\rangle^-$			11(2)			12(2)	14(1)		
652.37(11)	9^-									
659.858(3)	$\langle 4\rangle^-$									
666.148(4)	2^-									
673.004(5)	$\langle 6^+\rangle$								53(13)	
701.968(4)	3^-									
719.550(3)	$\langle 3\rangle^-$									
723.978(6)	3^+				22(11)			8(5)		
740.130(4)	$\langle 2\rangle^-$									
749.088(6)	$\langle 2,3\rangle^+$				10(3)					
776.40(3)	7^-								12(2)	41(3)
781.392(4)	5^-					20(2)				
782.533(4)	$\langle 5^-\rangle$									
805.070(14)	$\langle 6^-\rangle$									
817.016(4)	$\langle 4\rangle^-$									
835.285(5)	3^-									
843.3(3)	3^-–5^-									
856.053(4)	$\langle 4\rangle^-$									
881.9(7)	3^+–5^+									
897.80(25)	3^-,4^-									
910.10(25)	5^-									
915.8(3)	3^-,4^-									
939.629(5)	5^-									
960.411(6)	$\langle 4^-\rangle$									
960.527(5)	$\langle 5^-\rangle$									
986.27(25)	3^-,4^-									
999.8(5)	3^-,4^-									
1021.6(15)	3^+,4^+									
1028.4(5)	3^-,4^-									
1049.9(9)	3^-,4^-									
1056.6(5)	3^-,4^-									
1082.0(5)	3^-,4^-									
1101.2(8)	5^-									
1113.6(5)	5^-									
1116.04(6)	7^-								0.6(3)	50(4)

(continued) **$^{182}_{73}$Ta**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	16.3	97.8	114.3	150.1	163.0	173.2
[keV]		Γ_{cm}	J_f^π: 3^-	5^+	4^-	4^-	4^+	6^+	5^-
1125.0(15)	$\langle 2^-,5^-\rangle$								
1136.9(6)	$3^-,4^-$								
1150.4(5)	$3^-,4^-$								
1170.4(6)	$3^-,4^-$								
1196.0(10)	2^-–4^-								
1203.1(18)	3^+–5^+								
1216.1(11)	2^-								
1229.7(5)	$3^-,4^-$								
1240.4(5)	$3^-,4^-$								
1260.1(5)	$3^-,4^-$								
1269.5(5)	$3^-,4^-$								
1279.8(5)	$3^-,4^-$								
1284.4(5)	$3^-,4^-$								
1298.6(10)	2–5								
1302.5(6)	$3^-,4^-$								
1321.0(15)	$3^-,4^-$								
1326.0(22)	5^-								
1332.5(15)									
1336.84(12)	$\langle 8\rangle^-$								
1350.5(9)	$3^-,4^-$								
1360.4(8)	5^-								
1371.1(5)	$3^-,4^-$								
1377.3(14)	$3^-,4^-$								
1389.0(5)	$3^-,4^-$								
1393.4(8)	$3^-,4^-$								
1396.2(8)									
1416.7(15)	$3^-,4^-$								
1433.2(5)									
1445.1(16)	$3^-,4^-$								
1452.2(30)	$3^-,4^-$								
1471.9(7)	$3^-,4^-$								
1479.7(5)	$3^-,4^-$								
1482.9(6)									
1490.4(15)	$3^-,4^-$								
1496.4(5)	$3^-,4^-$								
1527.1(5)	$3^-,4^-$								
1538.1(15)	3,4,5								
1541.7(6)	$3^-,4^-$								
1545.6(23)	2^-								
1551.6(5)	5^-								
1555.7(8)	5^-								
1570.8(12)	2^-								
1577.2(8)	$3^-,4^-$								
1579.8(5)									
1582.3(6)	$3^-,4^-$								

(continued) **$^{182}_{73}$Ta**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	16.3	97.8	114.3	150.1	163.0	173.2
[keV]		Γ_{cm}	J_f^π: 3^-	5^+	4^-	4^-	4^+	6^+	5^-
1604.9(17)	3^-,4^-								
1612.0(8)	3^-,4^-								
1617.5(25)	3^-,4^-								
1628.3(8)	3^-,4^-								
1635.6(8)	3^-,4^-								
1641.8(15)	3^-,4^-								
1646.1(20)	2–5								
1650.5(27)	5^-								
1657.6(6)	2^-–4^-								
1661.7(6)	5^-								
1667.0(15)	2–5								
1674.3(6)	3^-,4^-								
1679.6(5)	3^-,4^-								
1695.4(5)	3^-,4^-								
1701.1(15)	3^-,4^-								
1711.6(12)	3^-,4^-								
1714.1(5)									
1724.7(9)	3^-,4^-								
1734.1(9)	3,4								
1746.5(9)	3^-,4^-								
1756.3(14)	5^-								
1762.5(12)	5^-								
1765.9(19)	2–5								
1769.6(10)	3,4								
1778.3(12)	3^-,4^-								
1843.0(5)									
1890.2(5)									
1905.0(5)									
1924.5(6)									
1944.8(6)									
1960.3(6)									
2009.0(5)									
2017.2(5)									
2029.7(5)									
2080.8(6)									
2160.6(7)									
2180.2(5)									

Additional data on this isotope can be found in [97Al28].

Energy levels and branching ratios [95Si04]. Part 2 **$^{182}_{73}$Ta**

E^*	J^π					Branching ratios in percentage						
		E_f^*:	237.3	250.0	269.0	270.4	292.9	316.4	334.6	360.5	364.3	390.1
[keV]		J_f^π:	5^-	$\langle 3\rangle^+$	$\langle 5^+\rangle$	2^-	5^-	6^-	7^+	$\langle 3\rangle^-$	4^+	
360.519(3)	$\langle 3\rangle^-$					19(9)						
364.347(3)	4^+			68(7)								
396.337(3)	$\langle 6^-\rangle$		62(6)									
402.623(4)	2^+					0.71(19)						
411.296(7)	$\langle 6^+\rangle$				73(23)							
443.607(3)	1^-					97(7)						
480.035(3)	4^-		5.2(5)			8.5(7)		7(3)		18(2)		
488.266(4)	$\langle 6^-\rangle$		22(2)				27(2)	21(4)				
491.424(3)	2^-									7.4(15)		
505.591(4)	5^+		4(2)	6.0(7)	14.4(11)						60(9)	
519.57(2)	10^-								99(6)			
547.096(3)	$\langle 3\rangle^-$			78(3)		3.1(2)					6.2(3)	
571.635(6)	4^+						8(2)					
579.428(6)	$\langle 7^+\rangle$								49(3)			
581.198(11)	$\langle 7^-\rangle$		40(7)									
592.957(4)	$\langle 1^+\rangle$					15.2(10)						
628.425(4)	5^-		15(1)							19(1)		
647.649(3)	$\langle 2\rangle^-$					38(2)				7.4(8)		
651.210(3)	$\langle 4\rangle^-$			19(1)			2(1)				9(1)	
659.858(3)	$\langle 4\rangle^-$		6.6(12)							2.8(13)		
673.004(5)	$\langle 6^+\rangle$										6(2)	
701.968(4)	3^-		12.2(13)			7(2)						
719.550(3)	$\langle 3\rangle^-$		11(5)			11(1)				5.6(7)		
723.978(6)	3^+					11(2)						
749.088(6)	$\langle 2,3\rangle^+$			19(3)		17(2)						
776.40(3)	7^-		13(4)				16(2)					18(2)
781.392(4)	5^-				25(11)		6(2)	6(3)			6(1)	
782.533(4)	$\langle 5^-\rangle$						26(2)					
805.070(14)	$\langle 6^-\rangle$		40(5)					22(13)				
817.016(4)	$\langle 4\rangle^-$			12(3)						11(1)		
835.285(5)	3^-		12(4)									
939.629(5)	5^-											28(3)
1116.04(6)	7^-						7(1)	25(3)				

Energy levels and branching ratios [95Si04]. Part 3 **$^{182}_{73}$Ta**

E^*	J^π					Branching ratios in percentage						
		E_f^*:	396.3	402.6	411.3	443.6	475.5	480.0	488.3	491.4	505.6	519.6
[keV]		J_f^π:	$\langle 6^-\rangle$	2^+	$\langle 6^+\rangle$	1^-	$\langle 3\rangle^+$	4^-	$\langle 6^-\rangle$	2^-	5^+	10^-
475.555(6)	$\langle 3\rangle^+$			100								
491.424(3)	2^-					83(21)						
547.096(3)	$\langle 3\rangle^-$			1.3(2)								

(continued) **$^{182}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	396.3	402.6	411.3	443.6	475.5	480.0	488.3	491.4	505.6	519.6
[keV]	J_f^π:	$\langle 6^- \rangle$	2^+	$\langle 6^+ \rangle$	1^-	$\langle 3 \rangle^+$	4^-	$\langle 6^- \rangle$	2^-	5^+	10^-
558.285(3)	$\langle 1 \rangle^-$		4.0(9)		89(9)						
565.690(3)	$\langle 3 \rangle^-$								100		
571.635(6)	4^+					26(8)					
579.428(6)	$\langle 7^+ \rangle$			26(2)							
581.198(11)	$\langle 7^- \rangle$	60(16)									
583.269(4)	$\langle 0^- \rangle$				100						
592.957(4)	$\langle 1^+ \rangle$		80(6)		5.0(9)						
628.425(4)	5^-	6(1)					17(2)				
647.649(3)	$\langle 2 \rangle^-$				8.3(6)				15.0(8)		
652.37(11)	9^-										100
659.858(3)	$\langle 4 \rangle^-$								3.7(8)		
666.148(4)	2^-				4.6(7)				5.2(9)		
673.004(5)	$\langle 6^+ \rangle$							10(5)		30(3)	
701.968(4)	3^-								64(4)		
719.550(3)	$\langle 3 \rangle^-$						3.3(5)		3.7(5)		
723.978(6)	3^+		12(1)								
740.130(4)	$\langle 2 \rangle^-$				15(3)		28(2)		3.8(6)		
749.088(6)	$\langle 2,3 \rangle^+$		41(3)						6.0(6)		
805.070(14)	$\langle 6^- \rangle$	17(2)					20(2)				
817.016(4)	$\langle 4 \rangle^-$						6(2)				
835.285(5)	3^-				10(3)						
1116.04(6)	7^-							2.8(7)			

Energy levels and branching ratios [95Si04]. Part 4 **$^{182}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	547.1	558.3	565.7	571.6	583.3	593.0	628.4	647.4	647.6	651.2
[keV]	J_f^π:	$\langle 3 \rangle^-$	$\langle 1 \rangle^-$	$\langle 3 \rangle^-$	4^+	$\langle 0^- \rangle$	$\langle 1^+ \rangle$	5^-	$\langle 2^+ \rangle$	$\langle 2 \rangle^-$	$\langle 4 \rangle^-$
647.428(5)	$\langle 2^+ \rangle$						62(16)				
647.649(3)	$\langle 2 \rangle^-$	19(3)		8(3)							
651.210(3)	$\langle 4 \rangle^-$	31(8)									
659.858(3)	$\langle 4 \rangle^-$			87(17)							
666.148(4)	2^-		74(7)			16(7)					
701.968(4)	3^-		17(2)								
719.550(3)	$\langle 3 \rangle^-$	6(1)	7(2)							31(8)	
723.978(6)	3^+				18(2)				30(13)		
740.130(4)	$\langle 2 \rangle^-$			6.0(11)						47(6)	
749.088(6)	$\langle 2,3 \rangle^+$									7(3)	
781.392(4)	5^-	4.1(6)									19(2)
782.533(4)	$\langle 5^- \rangle$			3.6(7)							
817.016(4)	$\langle 4 \rangle^-$			8.3(8)				6(2)			8.3(12)

(continued) **$^{182}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	547.1	558.3	565.7	571.6	583.3	593.0	628.4	647.4	647.6	651.2
[keV]	J_f^π:	$\langle 3\rangle^-$	$\langle 1\rangle^-$	$\langle 3\rangle^-$	4^+	$\langle 0^-\rangle$	$\langle 1^+\rangle$	5^-	$\langle 2^+\rangle$	$\langle 2\rangle^-$	$\langle 4\rangle^-$
835.285(5)	3^-			15(8)							
856.053(4)	$\langle 4\rangle^-$	2.7(10)		10.4(9)							

Energy levels and branching ratios [95Si04]. Part 5 **$^{182}_{73}$Ta**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	659.9	666.1	702.0	719.5	740.1	776.4	782.5	817.0	835.3	856.0
[keV]	J_f^π:	$\langle 4\rangle^-$	2^-	3^-	$\langle 3\rangle^-$	$\langle 2\rangle^-$	7^-	$\langle 5^-\rangle$	$\langle 4\rangle^-$	3^-	$\langle 4\rangle^-$
719.550(3)	$\langle 3\rangle^-$	22(7)									
781.392(4)	5^-	15(1)									
782.533(4)	$\langle 5^-\rangle$	71(7)									
817.016(4)	$\langle 4\rangle^-$				49(6)						
835.285(5)	3^-					64(6)					
856.053(4)	$\langle 4\rangle^-$	2.1(10)	3.3(6)	54(5)				27(12)			
939.629(5)	5^-	12(2)			10(4)				50(7)		
960.411(6)	$\langle 4^-\rangle$									100	
960.527(5)	$\langle 5^-\rangle$	13(2)		17(2)					28(5)		42(8)
1116.04(6)	7^-						15(1)				

Energy levels and branching ratios [95Si04]. Part 6 **$^{182}_{73}$Ta**

E^*	J^π	Branching ratios in percentage	
		E_f^*:	1116.0
[keV]		J_f^π:	7^-
1336.84(12)	$\langle 8\rangle^-$		100

Energy levels and branching ratios [92Fi02]. **$^{183}_{73}$Ta**

E^*	$2J^\pi$	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	73.174	143.200	459.070	545.57	572.815	730.92
[keV]		Γ_{cm}	$2J_f^\pi$:	7^+	$\langle 9\rangle^-$	$\langle 9\rangle^+$	$\langle 5^+\rangle$		$\langle 7^+\rangle$	
0.0	7^+	5.1(1) d							
73.174(12)	$\langle 9\rangle^-$	107(11) ns		100					
143.200(12)	$\langle 9\rangle^+$			100					
368.29(7)					38(7)	62(12)			
459.070(11)	$\langle 5^+\rangle$			74(9)		26(18)			

(continued) **$^{183}_{73}$Ta**

E^*	$2J^\pi$	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	73.174	143.200	459.070	545.57	572.815	730.92
[keV]		Γ_{cm}	$2J_f^\pi$: 7^+	$\langle 9\rangle^-$	$\langle 9\rangle^+$	$\langle 5^+\rangle$		$\langle 7^+\rangle$	
545.57(6)					37(8)	63(13)			
572.815(22)	$\langle 7^+\rangle$					100			
730.92(8)								100	
735.06(8)			100						
806.42(5)			50(10)		26(5)			1.6(3)	22(5)
856.929(12)	$\langle 5^-\rangle$		0.17(6)	93(10)		4.8(6)	1.3(3)	0.55(7)	
940.19(7)					27(5)	73(15)			
948.64(6)				21(14)	48(14)			31(9)	
960.07(13)									
971.47(8)								64(13)	
1030.28(11)									
1127.81(9)					74(15)	15(3)			
1150.77(6)						95(19)			
1543.41(4)	$\langle 5^-\rangle$		≈0.6	85(12)					
1784.32(20)			100						

Energy levels and branching ratios [92Fi02]. Part 2 **$^{183}_{73}$Ta**

E^*	$2J^\pi$	Branching ratios in percentage				
		E_f^*:	735.06	806.42	856.929	948.64
[keV]		$2J_f^\pi$:			$\langle 5^-\rangle$	
960.07(13)			100			
971.47(8)				36(7)		
1030.28(11)			100			
1127.81(9)				11(2)		
1150.77(6)				5.1(10)		
1543.41(4)	$\langle 5^-\rangle$				7.6(9)	7(4)

Energy levels and branching ratios [89Fi11]. **$^{184}_{73}$Ta**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage					
			E_f^*:	0.0	47.9	89.3	228.4	272.3
[keV]		Γ_{cm}	J_f^π:	$\langle 5^-\rangle$	$\langle 3^-\rangle$	$\langle 2^-\rangle$	$\langle 1^-\rangle$	$\langle 0^-\rangle$
0.0	$\langle 5^-\rangle$	8.7(1) h						
47.9(2)	$\langle 3^-\rangle$			100				
89.3(3)	$\langle 2^-\rangle$				100			
228.4(4)	$\langle 1^-\rangle$					100		
272.3(4)	$\langle 0^-\rangle$						100	

(continued) **$^{184}_{73}$Ta**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage					
			E_f^*:	0.0	47.9	89.3	228.4	272.3
[keV]		Γ_{cm}	J_f^π:	$\langle 5^- \rangle$	$\langle 3^- \rangle$	$\langle 2^- \rangle$	$\langle 1^- \rangle$	$\langle 0^- \rangle$
453.3(5)	$\langle 1^+ \rangle$							100
617.2(5)	$\langle 1^+ \rangle$							100

Energy levels and branching ratios [95Br04]. **$^{185}_{73}$Ta**

E^*	$2J^\pi$	S_N	$d\sigma/d\Omega$	A_γ	$T_{1/2}$ or	Ref.	Branching ratios in percentage	
							E_f^*:	0.0
[keV]		(t,α)	μb/sr		Γ_{cm}		$2J_f^\pi$:	$\langle 7^+ \rangle$
0.0	$\langle 7^+ \rangle$	0.79	73	+0.44(4)	49.4(15) m	80Lo10		
164.5	$\langle 9^- \rangle$	≈0.04,≈0.16	15	–0.29(10)		80Lo10		x
336(4)*	$\langle 11^- \rangle$	2.1	135	+0.31(3)		80Lo10		
409(4)	$\langle 1^+,3^+ \rangle$	<1.3	245	–0.16(3)		80Lo10		
527(4)	$\langle 13^- \rangle$		5	–0.23(18)		80Lo10		
590(4)	$\langle 5^+,7^+ \rangle$	≈0.16,≈0.58	76	+0.07(5)		80Lo10		
689(4)			5	+0.38(17)		80Lo10		
748(4)*	$\langle 15^- \rangle$		17	–0.25(10)		80Lo10		
811(4)	$\langle 3^+ \rangle$	0.11	20	–0.67(8)		80Lo10		
890(4)	$\langle 7^- \rangle$	0.35	73	+0.17(5)		80Lo10		
980(4)	$\langle 9^- \rangle$		25	+0.08(8)		80Lo10		
992.6(15)	$\langle 17^- \rangle$							
1018(4)			16	+0.06(10)		80Lo10		
1074(4)			16	+0.28(10)		80Lo10		
1153(4)	$\langle 11^- \rangle$	1.4	75	+0.28(5)		80Lo10		
1223(4)			15	–0.19(11)		80Lo10		
1258.5(16)	$\langle 19^- \rangle$							
1258.5+x	$\langle 21 \rangle$							
1378(4)		0.71	38	+0.33(8)		80Lo10		
1409(4)			32	–0.03(8)		80Lo10		
1475(4)	$\langle 5^+ \rangle$	0.52	112	+0.09(4)		80Lo10		
1583(4)			18	+0.15(10)		80Lo10		
1638(4)			25	+0.06(8)		80Lo10		
1744(4)			44	+0.00(6)		80Lo10		
1837(4)			21	–0.04(9)		80Lo10		
		80Lo10	80Lo10	80Lo10		Ref.		

Additional data on this isotope can be found in [05Wu07].
$S_N=(d\sigma_{exp})/(2 \times N \times (d\sigma/d\sigma_{DWBA}))$ with N=23 was introduced in [80Lo10, 89Br28].
* 9/2[514] rotational band, see other comments in [89Br28].