Energy levels and branching ratios [91Aj01]. $^{15}_{8}$O

E^* [keV]	$2J^\pi$	$2T$	ℓ_p	S'^+_p (d,n)	σ (d,n) μb/sr	S_N (d,n)	S_N (τ,d)	S_N (τ,α)	S_N (τ,α)	S_N (p,d)	ℓ_n	S^-_n (τ,α)	S^-_n (p,d)	$T_{1/2}$ or Γ_{cm}	Ref.
0.0	1^-	1	1	0.87	4000	0.96	1.0	3.3	3.3	3.2	1	0.9	2.2	122.24(16) s	91Aj01
5183(1)	1^+		⟨0⟩	0.0			0.02				0	≤0.1		5.7(7) fs	91Aj01
5240.9(3)	5^+		2	⟨0.03⟩			0.05				2	0.04		2.25(21) ps	91Aj01
6176.3(17)	3^-		1	0.04	2200	0.03	0.10	4.5	3.7	8.1	1	1.0	3.8	<1.74 fs	69Ba05
6793.1(17)	3^+		0	≤0.3			0.42				2			<20 fs	91Aj01
6859.4(9)	5^+		2	0.38			0.43				2			11.1(17) fs	91Aj01
7275.9(6)	7^+		2	0.42	12000	0.36	0.46							0.49(11) ps	91Aj01
7556.5(4)	1^+		0	0.4	21200	0.32	0.46							0.99(10) keV	70Ri01
8284.0(5)	3^+		0				0.04							3.6(7) keV	91Aj01
8743(6)	1^+													32 keV	
8922(2)	5^+													3.3(3) keV	
8922(2)	1^+													7.5 keV	
8982.1(17)	$\langle 1\rangle^-$													3.9(4) keV	
9484(8)	$\langle 3\rangle^+$													≈200 keV	
9488(3)	5^-													10.1(5) keV	
9609(2)	3^-													8.8(5) keV	
9662(3)	$\langle 7,9\rangle^-$													2(1) keV	
10290	$\langle 5^-\rangle$													3(1) keV	
10300	5^+													11(2) keV	
10461(5)	$\langle 9^+\rangle$													<2 keV	
10480	$\langle 3^-\rangle$													25(5) keV	
10506	$\langle 3\rangle^+$													140(40) keV	
10917(12)	7^+													90 keV	
10938(3)	1^+													99(5) keV	
11025(3)	1^-													25(2) keV	
11151(7)														<10 keV	
11218(3)	3^+													40(4) keV	
11565(15)														<10 keV	
11569(15)	5^-													20(15) keV	
11616(15)	$\langle 3,1\rangle^-$													80(50) keV	
11719(8)														<10 keV	
11748(3)	5^+													99(5) keV	
11846(3)	5^-													65(3) keV	
11980(10)	5^-													20(5) keV	
12129(15)	5^+													200(50) keV	
12222(20)														100(50) keV	
12255(13)	5^+	3												135(15) keV	
12295(10)															
12471(3)	5^-													77(4) keV	
12600(10)															
12800														≈250 keV	
12835(3)														16(1) keV	
13008(3)														215(3) keV	
13025(3)														40(30) keV	
13450	$\langle 1,3\rangle^+$													≈1000 keV	

(continued) $^{15}_{8}\mathrm{O}$

E^*	$2J^\pi$	$2T$	ℓ_p	S'^{+}_p	σ (d,n)	S_N	S_N	S_N	S_N	S_N	ℓ_n	S^-_n	S^-_n	$T_{1/2}$ or	Ref.
[keV]				(d,n)	μb/sr	(d,n)	(τ,d)	(τ,α)	(τ,α)	(p,d)		(τ,α)	(p,d)	Γ_cm	
13490	$\langle 3^+\rangle$														
13600	5^+														
13700	3^-														
13790	3^-														
13870														≈150 keV	
14030(40)	$\langle 1^-,3^-\rangle$													160(20) keV	
14170	5^-														
14270(10)	1^+													340(30) keV	
14340	5^+													240 keV	
14465(10)	$3^+,5^+$													100(10) keV	
14700(40)														170(35) keV	
14950(40)														400(25) keV	
15050(10)	$\langle 13^+\rangle$														
15100	$\langle 1,3\rangle^+$													≈1000 keV	
15450(30)														70(20) keV	
15540(10)															
15600(10)															
15650(10)															
15800(10)															
15900(15)	$1^-,3^-$													350 keV	
16050(20)														≈185 keV	
16100(20)															
16210(20)														≈140 keV	
16430(75)	1^+													560(100) keV	
16750(50)															
17050(60)	$\langle 1,3\rangle^+$	1												700(70) keV	
17460(20)															
17510(20)	$1^-,3^-$													640(120) keV	
17990(50)	$1^-,3^-$													200 keV	
18230(50)															
18670(60)	$\langle 1,3\rangle^+$	1												520(110) keV	
19030(50)														1120(300) keV	
19570(80)	$\langle 1,3\rangle^+$	1												780(270) keV	
19910(50)															
20420(70)	$\langle 3,1\rangle^+$	1												970(240) keV	
21560(70)	$\langle 3,1\rangle^+$	1												730(120) keV	
23800(100)														≤500 keV	
26000	$\langle 13^-\rangle$													≈600 keV	
28000	$\langle 9^-,1^-\rangle$													≈2500 keV	
29000														≈2500 keV	

(continued) $^{15}_{8}$O

E^* [keV]	$2J^\pi$	$2T$	ℓ_p	S'^{+}_{p} (d,n)	σ (d,n) μb/sr	S_N (d,n)	S_N (τ,d)	S_N (τ,α)	S_N (τ,α)	S_N (p,d)	ℓ_n	S^-_n (τ,α)	S^-_n (p,d)	$T_{1/2}$ or Γ_{cm}	Ref.
				71Bo35	70Ri01	70Ri01		80Lu03		80Lu03		91Aj01			Ref.
							69Al04		80Lu03				69Ba05		Ref.

Additional data on this isotope can be found in [73Ma21, 68Bo14].
S'^{+}_{p} and S_N in [91Aj01] were obtained as evaluation of data on ^{14}N(d,n)^{15}O [71Bo35], ^{14}N(h,d)^{15}O [69Al04] and ^{16}O($^{3}He,\alpha$)^{15}O reactions from many experimental works (see full references there); results from measurements of the (d,n) and (τ,d) reactions [71Bo35, 70Ri01] are given separately.

Energy levels and branching ratios [91Aj01]. Part 2 $^{15}_{8}$O

E^*	$2J^\pi$		Branching ratios in percentage						
		E^*_f:	0.0	5183	5241	6176	6793	6859	7276
[keV]		$2J^\pi_f$:	1^-	1^+	5^+	3^-	3^+	5^+	7^+
5183(1)	1^+		100						
5240.9(3)	5^+		100						
6176.3(17)	3^-		100						
6793.1(17)	3^+		100						
6859.4(9)	5^+				100				
7275.9(6)	7^+		3.8(12)		96.2(12)				
7556.5(4)	1^+		3.5(5)	15.8(6)		57.5(4)	23.2(6)	<6	
8284.0(5)	3^+		53.2(3)	1.2(1)	42.2(5)	2.2(6)		1.2(3)	
8743(6)	1^+			64(3)		36(3)			
8922(2)	5^+		22(11)	5(2)	22(2)	9(4)	14(2)	9(4)	4(4)
8982.1(17)	$\langle 1\rangle^-$		94.0(10)	6.0(10)					
9484(8)	$\langle 3\rangle^+$		100						
9488(3)	5^-		85		6.4	0.7		3.4	5.0
9609(2)	3^-		79		19	2.0			
10461(5)	$\langle 9^+\rangle$				62(6)			<4.0	38(6)
10480	$\langle 3^-\rangle$		60(6)		40(6)	<4	<4		
10938(3)	1^+		44(8)	34(3)		22(8)	<8		
11025(3)	1^-		100						
11218(3)	3^+		74(5)	14(5)	12(5)		<4		
11569(15)	5^-		18(9)		62(9)	20(9)	<3		
11748(3)	5^+				47(7)	53(7)			
11846(3)	5^-				100				

Energy levels and branching ratios [93Ti07]. $^{16}_{8}$O

E^*	J^π	T	ℓ_p	S'^+_p	S'^+_p	ℓ_n	$d\sigma/d\Omega$	C^2S	C^2S	S^-_n	σ (p,p′)	$T_{1/2}$ or	Ref.
[keV]				(d,n)	(τ,d)	(d,t)	(d,t)	(d,t)	(d,t)	(τ,α)	μb/sr	Γ_{cm}	
0.0	0^+	0	1	2.5*	1.33	2	1736(22)	1.034(84)	0.74	0.88		Stable	71Bo02
6049.4(10)	0^+	0	1	small	0.05	2	17.9(22)	0.016(4)		0.009	10(1)	67(5) ps	93Ti07
						0							
6129.89(4)	3^-		2	0.80	0.40	1	527(22)	0.578(137)	0.46	0.37	23(1)	18.4(5) ps	93Ti07
						3		0.373(81)					
6917.1(6)	2^+		1+3	≈0	0.04	$\langle 2\rangle$	79(12)	0.030(4)		0.022	249(7)	4.70(13) fs	93Ti07
7116.9(1)	1^-		0+2	0.32	0.20	1	39(3)	0.055(6)	0.04	0.007	19(1)	8.3(5) fs	93Ti07
8871.9(5)	2^-		2	0.44	0.36	1	289(24)	0.335(86)	0.33	0.26	12(1)	125(11) fs	93Ti07
						1		0.137(48)					93Ti07
9585(11)	1^-		0	small	0.01							420(20) keV	
9844(1)	2^+			small		2	12.9(27)	0.007(3)		0.025	64(2)	0.62(10) keV	93Ti07
10356(3)	4^+		3	small	0.02	2	19.9(35)	0.016(4)		0.025	11(1)	26(3) keV	93Ti07
10957(1)	0^-		0	0.76	0.50		6.7(34)			0.008	22(2)	5.5(35) fs	93Ti07
11080(3)	3^+		3	0.30	0.09	2					24(2)	<12 keV	93Ti07
11097(2)	4^+				incl		26.1(53)				incl	0.28(5) keV	93Ti07
11260	$\langle 0^+\rangle$											2500 keV	
11520(4)	2^+						20(18)				137(5)	71(3) keV	93Ti07
11600(20)	3^-											800(100) keV	
12049(2)	0^+										72(3)	1.5(5) keV	
12440(2)	1^-	0	0	0.40	0.25(10)						36(2)	91(6) keV	93Ti07
12530(1)	2^-	0	2	0.72	0.45(10)	1	54(22)	0.234(46)	0.07		57(2)	111(10) eV	93Ti07
						1		0.036(15)					93Ti07
12796(4)	0^-	1	0	0.44	0.40(10)		30(5)				24(2)	40(4) keV	93Ti07
12969(1)	2^-	1	2	0.40	0.35(10)	1	356(22)	0.396(101)	0.69	0.38	176(6)	1.34(4) keV	93Ti07
13020(10)	2^+	0									498(14)	150(10) keV	02Ka32
13090(8)	1^-	1		0.58	≤0.4	1				0.1	incl	130(5) keV	93Ti07
13129(10)	3^-	0		0.32	0.12(5)	1	62(17)	0.058(19)				110(30) keV	93Ti07
						1		0.019(12)					93Ti07
13259(2)	3^-	1	2	0.46	0.27(10)	1	335(22)	0.562(106)	0.70	0.34		21(1) keV	93Ti07
13664(3)	1^+	0										64(3) keV	
13869(2)	4^+	0				$\langle 2\rangle$	10.3(46)	0.015(3)				89(2) keV	93Ti07
13980(2)	2^-					1	11.9(47)	0.016(4)				20(2) keV	93Ti07
14032(15)	0^+											185(35) keV	
14100(10)	3^-											750(200) keV	
14302(3)	$4^{\langle -\rangle}$						24(9)					34(12) keV	93Ti07
14399(2)	5^+						8(6)					27(5) keV	93Ti07
14620(20)	$4^{\langle +\rangle}$											490(15) keV	
14660(20)	5^-											670(15) keV	
14815.3(16)	6^+	0										70(8) keV	
14926(2)	2^+											54(5) keV	
15097(5)	0^+											166(30) keV	
15196(3)	2^-	0				1	38(17)	0.106(30)	0.12			63(4) keV	93Ti07
15260(50)	2^+	$\langle 0\rangle$										300(100) keV	
15408(2)	3^-	0				1	76(17)	0.242(38)	0.37			132(7) keV	93Ti07
15785(5)	3^+											40(10) keV	

(continued) $^{16}_{8}$O

E^* [keV]	J^π	T	ℓ_p	S'^+_p (d,n)	S'^+_p (τ,d)	ℓ_n (d,t)	$d\sigma/d\Omega$ (d,t)	C^2S (d,t)	C^2S (d,t)	S^-_n (τ,α)	σ (p,p′) μb/sr	$T_{1/2}$ or Γ_{cm}	Ref.
15828(30)	3^-											700(120) keV	
16200(90)	1^-	0										580(60) keV	
16209(2)	1^+	1										19(3) keV	
16275(7)	6^+											420(20) keV	
16352(8)	$\langle 2^+\rangle$											61(8) keV	
16442.3(16)	2^+	1										25(2) keV	
16817(2)	$\langle 3^+\rangle$	⟨1⟩				⟨2⟩	72(4)	0.015(5)				28(3) keV	93Ti07
16844(21)	4^+											570(60) keV	
16930(50)	2^+											≈280 keV	
17090(40)	1^-	1										380(40) keV	
17129(5)	2^+											107(14) keV	
17140(10)	1^+	1										34(3) keV	
17197(17)	2^+											160(60) keV	
17282(11)	1^-	1										78(5) keV	
17510(26)	1^-											180(60) keV	
17555(21)	$\langle 6^+\rangle$											180(70) keV	
17609(7)	2^+	⟨1⟩										114(14) keV	
17720	$\langle 0^+,2^+\rangle$											≈75 keV	
17775(11)	4^-	0				1	48(13)	0.089(45)	0.17			45(7) keV	93Ti07
17784(15)	4^+											400(40) keV	
17877(6)	$\langle 2\rangle^-$	1										24(3) keV	
18016(1)	4^+	⟨0⟩										14(2) keV	
18029(5)	$3^{\langle -\rangle}$	1				1	76(21)	0.102(23)	0.12			26(4) keV	93Ti07
18089(25)	$\langle 0^+\rangle$											288(44) keV	
18202(8)	2^+											220(50) keV	
18290												≈380 keV	
18404(12)	5^-											550(40) keV	
18430(15)	2^+	0										90(40) keV	
18484(6)	$1^-,2^-$					1	95(26)	0.129(28)	0.25			35(6) keV	93Ti07
18600	$\langle 1^-,5^-\rangle$											≈150 keV	
18600	$\langle 4^+\rangle$											≈300 keV	
18640(15)	$\langle 5^+\rangle$											22(7) keV	
18773(22)	1^-											215(45) keV	
18785(6)	4^+											260(20) keV	
18790(10)	1^+	1										120(20) keV	
18977(6)	4^-	1				1	502(11)	0.706(65)	0.73			8(4) keV	93Ti07
19001(24)	2^-	1										420(50) keV	
19080(30)	2^+	⟨1⟩										≈120 keV	
19206(12)	3^-	1				1	227(10)	0.338(36)	0.50			68(10) keV	93Ti07
19253(30)	$\langle 5^-\rangle$											50(45) keV	
19257(9)	2^+	⟨1⟩										155(25) keV	
19319(14)	$\langle 6^+\rangle$											65(35) keV	
19375(2)	4^+											23(4) keV	
19470(30)	1^-	1										200(70) keV	
19539(19)	2^+	0										255(75) keV	

(continued)

$^{16}_{8}$O

E^* [keV]	J^π	T	ℓ_p	$S_p'^+$ (d,n)	$S_p'^+$ (τ,d)	ℓ_n (d,t)	$d\sigma/d\Omega$ (d,t)	C^2S (d,t)	C^2S (d,t)	S_n^- (τ,α)	σ (p,p′) μb/sr	$T_{1/2}$ or Γ_{cm}	Ref.
19754(16)	2^+											290(50) keV	
19808(11)	4^-	0				1	281(127)	0.423(116)	0.52			32(4) keV	93Ti07
19895(7)	3	1										42(9) keV	
20055(13)	2^+	0										400(32) keV	
20412(17)	$\langle 2^-,4^+\rangle$	1										190(20) keV	
20510(25)	$\langle 4^-\rangle$	$\langle 1\rangle$				1	65(10)	0.015(18)				50(30) keV	93Ti07
						1		0.144(29)	0.21				78Ma16
20541(2)	5^-	1										11(2) keV	
20560(2)												<5 keV	
20615(3)												<10 keV	
20800												≈60 keV	
20857(14)	7^-											900(60) keV	
20945(20)	1^-	1				1	16(6)	0.032(9)				300(10) keV	93Ti07
21050(50)	$\langle 2^+\rangle$	$\langle 0\rangle$										298(43) keV	
21052(6)	6^+											205(15) keV	
21175(15)													
21500	$\langle 1–4\rangle$											120 keV	
21623(11)	7^-											60(30) keV	
21648(3)	6^+											115(8) keV	
21776(9)	3^-											43(20) keV	
22040	0^+											60 keV	
22150(10)	1^-	1										680(10) keV	
22350	2^+											175 keV	
22500(10)	3^-											400(50) keV	
22650(30)												60 keV	
22721(3)	0^+	2										12.5(25) keV	
22890(10)	1^-	1				1	50(12)	0.109(23)				300(10) keV	93Ti07
23000(10)	6^+											≤500 keV	
23100												≈20 keV	
23235(62)	$\langle 1^-\rangle$	$\langle 1\rangle$										560(150) keV	
23510(30)	$\langle 5^-\rangle$											300 keV	
23879(6)	6^+											26(4) keV	
24070(30)	1^-	1										550(40) keV	
24360(70)	$\langle 2^+,3^-\rangle$	0										424(45) keV	
24522(11)	2^+	2										<50 keV	
24760(50)	$\langle 2,4\rangle^+$	1										340(60) keV	
25120(50)	1^-	1										3000(300) keV	
25500(15)	1^-	1										1300(300) keV	
25600	$\langle 3^-\rangle$	1										450 keV	
26000(10)	1^-	$\langle 1\rangle$										750(250) keV	
26363(62)	$\langle 2,4\rangle^+$	1										550(70) keV	
27350(10)	$\langle 2,4\rangle^+$	1										830(110) keV	
27500	$\langle 3^-\rangle$	$\langle 0\rangle$										≈2500 keV	
28200	7^-											1000 keV	
28600(20)													

(continued) $^{16}_{8}$O

E^* [keV]	J^π	T	ℓ_p	S'^+_p (d,n)	S'^+_p (τ,d)	ℓ_n (d,t)	$d\sigma/d\Omega$ (d,t)	C^2S (d,t)	C^2S (d,t)	S^-_n (τ,α)	σ (p,p′) μb/sr	$T_{1/2}$ or Γ_{cm}	Ref.
29000	7^-											1000 keV	
29800(10)	9^-,8^+											750(250) keV	
31800(60)													
34000	10^+,⟨9^-⟩											2300 keV	
35000													
				72Bo49			90Sa27	90Sa27	78Ma16	71Bo02	02Ka32		Ref.
					71Bo02								Ref.

Additional data on this isotope can be found in [03Fe04, 02Ti03, 02Ka32, 02Ho05, 01Lu18, 01Br23, 01Du11, 01Du12, 01Bu20, 01Bu23, 01Ku09, 00Br54, 68Ho0A].
Abundance: 99.76(2) %.
* S'^+_p=3.1 given as the "best value" in compilations [77Aj02, 93Ti07] is based on measurements in [69Fu08, 72Bo49, 75Hs01]; here are values S'^+_p from [72Bo49]; C^2S [90Sa27] and S^-_n [71Bo02] were selected in the evaluation [93Ti07].
Four values S'^+_p of highly-excited T=1 levels in ^{16}O are in agreement with values S_N=0.46, 0.55, 0.52 and 0.54 obtained in measurement of the (d,p) reaction [72Bo49] for the corresponding T=1 low-lying levels of ^{16}N.
Two independent values C^2S from measurement of the (d,t) reaction [90Sa27, 78Ma16] are given for comparison.
Cross section σ (p,p′) corresponds to 0°, see data for 4° and discussion in [02Ka32].
Only data for the levels with known S_N are given here.
Data for this isotope are considered in vol. LB I/18A.

Energy levels and branching ratios [93Ti07]. Part 2 $^{16}_{8}$O

E^*	J^π		Branching ratios in percentage					
		E^*_f:	0.0	6049	6130	6917	7116.85	8871.9
[keV]		J^π_f:	0^+	0^+	3^-	2^+	1^-	2^-
6049.4(10)	0^+		x					
6129.89(4)	3^-		100					
6917.1(6)	2^+		100	0.027(3)	≤0.008			
7116.9(1)	1^-		100	<0.0006	0.070(14)			
8871.9(5)	2^-		7.2(8)	0.12(4)	78(16)	3.6(5)	11.4(5)	
9585(11)	1^-		89(14)			11(4)		
9844(1)	2^+		61(4)	18(4)		21(4)		
10356(3)	4^+		$9(3)\cdot10^{-7}$		<1.6	100		
10957(1)	0^-						100	
11097(2)	4^+				55(23)	45(11)		
11520(4)	2^+		91.7(12)	4.2(7)		4.0(10)	≤0.8	
12049(2)	0^+		x					
12440(2)	1^-		99	1.2(4)				
12530(1)	2^-		6.0(6)		49(2)	<1	12.0(7)	33(2)
12796(4)	0^-						100	

(continued) $^{16}_{8}$O

E^*	J^π		Branching ratios in percentage					
		E^*_f:	0.0	6049	6130	6917	7116.85	8871.9
[keV]		J^π_f:	0^+	0^+	3^-	2^+	1^-	2^-
12969(1)	2^-		2.1(4)		50(2)		6(1)	42(2)
13020(10)	2^+		100					
13090(8)	1^-		96	0.56(12)			3.0(8)	

Energy levels and branching ratios [93Ti07]. $^{17}_{8}$O

E^* [keV]	$2J^\pi$	$2T$	ℓ_n	C^2S (d,t)	C^2S (τ,α)	S_N (d,p)	S_N (α,τ)	σ (α,τ) μb	$T_{1/2}$ or Γ_{cm}	Ref.
0.0	5^+		2	1.53		≈0.9	1.3	12100	Stable	93Ti07
870.73(10)	1^+		0	0.21		≈0.9	0.90	230	179.2(18) ps	93Ti07
3055.36(16)	1^-		1	1.08					0.08(+6-4) ps	93Ti07
3842.8(4)	5^-		>2						≤18 fs	
4553.8(16)	3^-		1	0.12		0.23			40(5) keV	93Ti07
5084.8(9)	3^+		2	0.10		1.25	0.67	770	96(5) keV	93Ti07
5215.8(5)	9^-								<0.1 keV	
5379.2(14)	3^-		1	0.53					28(7) keV	93Ti07
5697.3(4)	7^-					≈0.15	0.17	1420	3.4(3) keV	77Aj02
5732.8(5)	⟨5^-⟩								<1 keV	
5869.1(6)	3^+						0.06	80	6.6(7) keV	92Ya08
5939(4)	1^-		1	0.06					32(3) keV	93Ti07
6356(8)	1^+								124(12) keV	
6862(2)	⟨5^+⟩								<1 keV	
6972(2)	⟨7^-⟩						0.08	150	<1 keV	92Ya08
7165.7(8)	5^-								1.38(5) keV	
7202(10)	3^+								280(30) keV	
7379.2(10)	5^+								0.64(23) keV	
7382.2(10)	5^-								0.96(20) keV	
7559(20)	3^-								500(50) keV	
7576(2)	⟨7^-⟩						0.01	70	<0.1 keV	92Ya08
7688.2(9)	7^-						0.10	450	14.4(3) keV	92Ya08
7757(9)	11^-							620		92Ya08
7956(6)	1^+								90(9) keV	
7990(50)	1^-								270(30) keV	
8070(10)	3^+								85(9) keV	
8200(7)	3^-		1	0.15					60 keV	93Ti07
8342.4(9)	1^+								11.4(5) keV	
8402.3(8)	5^+						0.15	290	6.17(13) keV	92Ya08
8466.0(8)	7^+								2.13(11) keV	
8500.7(8)	5^-								6.89(22) keV	
8687.0(10)	3^-		1	0.10					55.3(6) keV	93Ti07
8885(14)	7^-,9^-								6 keV	

(continued) $^{17}_{8}$O

E^* [keV]	$2J^\pi$	$2T$	ℓ_n	C^2S (d,t)	C^2S (τ,α)	S_N (d,p)	S_N (α,τ)	σ (α,τ) μb	$T_{1/2}$ or Γ_{cm}	Ref.
8897(8)	3^+								101(3) keV	
8967.2(17)	7^-								26(2) keV	
9147(4)	1^-								4(3) keV	
9150(20)	9^-		1	0.10						93Ti07
9180	7^-								3 keV	
9193.9(8)	5^+								3.53(13) keV	
9420	3^-								120 keV	
9492(4)	5^-								15(1) keV	
9711.9(9)	7^+								23.1(3) keV	
9783.3(9)	3^+								11.7(3) keV	
9858.9(9)	$\langle 5^- \rangle$								4.01(23) keV	
9876.5(13)	$\langle 1^- \rangle$								16.7(17) keV	
9976(20)	5^+								≈80 keV	
10045(20)									≈100 keV	
10167.8(10)	7^-								49.1(8) keV	
10336(15)	$5^+,7^-$								150 keV	
10423(3)									14(3) keV	
10490	$5^+,7^-$								75(30) keV	
10559.1(10)	$\langle 7^- \rangle$								42.5(11) keV	
10777(3)	$1^+,7^-$								74(3) keV	
10913(3)	$\langle 5^+ \rangle$								41.7(14) keV	
11036(3)									31(3) keV	
11078.7(9)	1^-	3	1	0.96	0.49				2.4(3) keV	69De06
11238									80(3) keV	
11410(10)		1	⟨1⟩	0.04						93Ti07
11510	≥3	1							190 keV	
11622									65(2) keV	
11750(10)									40(25) keV	
11815(15)									12(3) keV	
12005(15)	≥3								270 keV	
12110(20)		1	⟨1⟩	0.24					150(50) keV	93Ti07
12220(20)									≤20 keV	
12274(15)									100(30) keV	
12380(20)										
12420(15)										
12466.0(10)	3^-	3	1	0.24	0.27				6.9(11) keV	93Ti07
12595(15)									75(30) keV	
12669(15)									≈5 keV	
12760(10)		1	⟨1⟩	0.17						93Ti07
12810(25)										
12930(20)									≥150 keV	
12944(5)	1^+	3	0	0.19(5)	0.096				6(2) keV	93Ti07
12998.2(10)	5^-	3							2.5(10) keV	
13076(15)									16(4) keV	
13484(15)									≈120 keV	

(continued) $^{17}_{8}O$

E^* [keV]	$2J^\pi$	$2T$	ℓ_n	C^2S (d,t)	C^2S (τ,α)	S_N (d,p)	S_N (α,τ)	σ (α,τ) μb	$T_{1/2}$ or Γ_{cm}	Ref.
13580(20)	$11^-,13^-$								68(19) keV	
13609(15)									250(100) keV	
13635.3(25)	$\langle 5\rangle^+$	3	2	0.29(12)	0.39				9(5) keV	93Ti07
13670									400 keV	
14150(10)	$\langle 9^+,11^+\rangle$								≈100 keV	
14230.3(17)	7^-	3							20.5(16) keV	
14286(3)		1							7.5(4) keV	
14451(3)									40(6) keV	
14720	9^-	3							35(11) keV	
14760(10)	$\langle\geq 3\rangle$								340 keV	
14791(3)	$\langle 1^-\rangle$	⟨3⟩							36(13) keV	
15000									180 keV	
15100(10)	$\langle 9^+,11^+\rangle$								≈500 keV	
15199(3)		1							52(14) keV	
15368(3)	$\langle 5^+\rangle$	⟨3⟩							40(6) keV	
15600		1							≈300 keV	
15780(20)	$\langle 13^-\rangle$	⟨3⟩							≤30 keV	
15950(15)	$\langle 9^+,11^+\rangle$								≈700 keV	
16243(4)	$\langle 9^+\rangle$	⟨3⟩							21(10) keV	
16580(10)	$\langle 1,3\rangle^-$	3	1	0.93					≈300 keV	93Ti07
16600(15)	$11^-,13^-$									
17060(20)	11^-	1							≤20 keV	
17436(11)		3							66(20) keV	
17920(20)									98(16) keV	
18110(4)	3^-	3	1	0.17					46(12) keV	93Ti07
18720(20)									87(33) keV	
19600(15)	$\langle 13^+,15^+\rangle$								≈250 keV	
19820(40)	3								550(50) keV	
20140(20)	11^-	1							31(5) keV	
20200(15)	$\langle 13^+,15^+\rangle$								≈250 keV	
20390(50)	$5,7^-$								660(70) keV	
20580(50)	1								570(80) keV	
20700(20)	$\langle 9^-\rangle$	⟨3⟩							≤20 keV	
21050(50)	3								470(60) keV	
21200	$\langle 13^+,15^+\rangle$									
21700(10)	5^+								≈750 keV	
22100(10)	7^-								≈750 keV	
22500(20)	$3^{\langle -\rangle}$								≈1000 keV	
23000									≈6000 keV	
23000	1^+								≈400 keV	
23500										
24400										

(continued) $^{17}_{8}$O

E^* [keV]	$2J^\pi$	$2T$	ℓ_n	C^2S (d,t)	C^2S (τ,α)	S_N (d,p)	S_N (α,τ)	σ (α,τ) μb	$T_{1/2}$ or Γ_{cm}	Ref.
				77Ma10	69De06	77Aj02	92Ya08	92Ya08		Ref.
						73Da17				Ref.

Additional data on this isotope can be found in [04St10, 03StZY, 01Du12, 94Do08, 90Pi05, 78Cl08].
Abundance: 0.038(1) %.
E1 transition is observed from the level at E^*=11078.7 keV to the first excited state.
Only data for the levels with known spectroscopic factors are given for $E^* > 8$ MeV.
Data for this isotope are considered in vol. LB I/18A.

Energy levels and branching ratios [93Ti07]. Part 2 $^{17}_{8}$O

E^* [keV]	$2J^\pi$	Branching ratios in percentage E_f^*: / $2J_f^\pi$:	0.0 / 5^+	870.73 / 1^+
870.73(10)	1^+		100	
3055.36(16)	1^-			100
3842.8(4)	5^-		100	
4553.8(16)	3^-		x	x

Energy levels and branching ratios [95Ti07]. $^{18}_{8}$O

E^* [keV]	J^π	T	ℓ	S_{dp}	S_N (α,τ)	σ (α,τ) μb/sr	σ (^{6}Li,p) μb	σ (^{7}Li,p) μb	C^2S (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
0.0	0^+		2	1.22	0.86	220	6.1(3)	41.7(17)	1.00	Stable	95Ti07
1982.07(9)	2^+		0	0.21	0.79	640	39(1)	243(4)	1.39	1.94(5) ps	95Ti07
			+2	0.83							95Ti07
3554.8(4)**	4^+		2	1.57	0.84	1590	56(1)	429(5)	≈0.1	17.2(8) ps	95Ti07
3633.76(11)	0^+		2	0.28			13(1)	58.5(10)	0.13(5)	0.96(11) ps	95Ti07
3920.44(14)	2^+		0	0.35			36(1)	209(3)	0.05(2)	18.4(20) fs	95Ti07
			+2	0.66							95Ti07
4455.54(10)	1^-		1	0.03			46(1)	164(2)	1.31	45(10) fs	95Ti07
5097.78(54)	3^-		3	0.03			74(1)	387(5)		43(17) fs	95Ti07
5254.8(9)	2^+		0	0.35			44(1)	353(4)	0.84(25)	7.0(3) fs	95Ti07
5336.4(6)	0^+		2	0.16				217(2)	0.40(16)	139(28) fs	95Ti07
5377.8(12)	3^+		0	1.01	1.04	120	35(1)	incl		<21 fs	95Ti07
5530.24(29)	2^-						45(1)	218(3)		<17 fs	88Sm01
6198.22(40)	1^-		1	0.03			37(1)	103(2)	0.70	2.6(4) fs	95Ti07
6351.3(6)	⟨2^-⟩		1	0.03			131(2)	521(4)	incl	<24 fs	95Ti07
6404.4(12)	3^-						incl	incl		21(10) fs	

(continued) $^{18}_{8}$O

E^* [keV]	J^π	T ℓ	S_{dp}	S_N (α,τ)	σ (α,τ) μb/sr	σ (^{6}Li,p) μb	σ (^{7}Li,p) μb	C^2S (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
6880.45(27)	0^-					5.3(4)	33.8(7)	1.03	<17 fs	78Fo29
7116.9(12)	4^+			0.31	90	208(2)	892(10)		<17 fs	95Ti07
7615.9(7)	1^-					33(1)	124(2)	0.42	<2.5 keV	88Sm01
7771.07(50)	2^-					37(1)	262(3)	incl	<50 keV	88Sm01
7864(5)	5^-				140	101(2)	487(6)			95Ti07
7977(4)	$\langle 3^+,4^- \rangle$					84(1)	380(4)			88Sm01
8037.8(7)	1^-					19(1)	80(1)		<2.5 keV	93Ha17
8125(2)	5^-				60	140(2)	500(6)			95Ti07
8213(4)	2^+					48(1)	508(6)		1.0(8) keV	88Sm01
8282(3)	3^-					103(2)	368(4)		8(1) keV	78Fo29
8410(8)	$\langle 2^- \rangle$					45(1)			8(6) keV	88Sm01
8521(6)						75(1)				88Sm01
8660(6)						20.8(10)				88Sm01
8817(12)	$\langle 1^+ \rangle$			0.55	40	13.0(9)			70(12) keV	88Sm01
8955(4)						16.3(10)			43(3) keV	88Sm01
9000(20)	$\langle 1^- \rangle$									
9030										
9100										
9270(20)	$\langle 0–2 \rangle^-$									
9361(6)	$\langle 3^- \rangle$								27(15) keV	
9414(18)									≈120 keV	
9480(24)									≈65 keV	
9672(7)	$\langle 3^- \rangle$								60(30) keV	
9713(7)						26.3(13)				88Sm01
9890(11)									≈150 keV	
10118(10)	3^-					30.6(15)			16(4) keV	88Sm01
10240(20)	$\langle 0–2 \rangle^-$					100(5)				88Sm01
10295(14)	4^+					incl			<50 keV	
10396(9)	3^-									
10430(40)	$\langle 2^- \rangle$								<50 keV	
10595(15)										
10670(20)	$\langle 2^- \rangle$					31.3(16)			<50 keV	88Sm01
10820(20)										
10910(20)						42.7(21)				88Sm01
10990(20)	$\langle 2^- \rangle$					84.8(42)			<50 keV	88Sm01
11060	$\langle 6^- \rangle$				180					95Ti07
11130(20)						17.7(9)		[0.65]		88Sm01
11260(20)*						34(2)				88Sm01
11390(20)	$\langle 2^+ \rangle$					47(2)				88Sm01
11410(20)	$\langle 4^+ \rangle$					incl				
11490(30)	$\langle 0–2 \rangle^-$									
11520(50)	$\langle 2^- \rangle$								<50 keV	
11620(20)	5^-					34(2)				88Sm01
11670(20)	$\langle 3^- \rangle$								112.00(2) keV	
11690(20)	6^+					75(4)				88Sm01

(continued) $^{18}_{8}$O

E^* [keV]	J^π	T	ℓ	S_{dp}	S_N (α,τ)	σ (α,τ) μb/sr	σ (^{6}Li,p) μb	σ (^{7}Li,p) μb	C^2S (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
11820(20)	$\langle 3^- \rangle$						82(4)		[0.72]		88Sm01
11900(30)	$\langle 2^- \rangle$									<50 keV	
12040(20)	$\langle 2^+ \rangle$										
12090(20)	$\langle 1^-,2^+ \rangle$						34(2)			<50 keV	88Sm01
12250(20)	$\langle 1^- \rangle$						32(2)		[0.89]		88Sm01
12330(20)	5^-						50(3)				88Sm01
12410(20)	$\langle 3^- \rangle$						96(5)			143(24) keV	88Sm01
12500(20)	4^+										
12520(20)							90(5)			<50 keV	88Sm01
12530(20)	6^+						incl			<250 keV	02Cu04
12660(20)	$\langle 2^- \rangle$									<50 keV	
12990(20)	$\langle 4^- \rangle$									68(18) keV	
13000	$\langle 2^+,4^+ \rangle$									<300 keV	02Cu04
13100	1^-						48(2)			700 keV	88Sm01
13230(30)*							99(5)				88Sm01
13400(20)	$\langle 2^- \rangle$						24.6(12)			108(20) keV	88Sm01
13600(30)*							29.0(15)				88Sm01
13800	1^-						159(8)			600 keV	88Sm01
13850(13)	$\langle 6^- \rangle$					20				≈200 keV	95Ti07
14170(40)	$\langle 6^- \rangle$					10	93(5)			140(50) keV	95Ti07
14450(50)										≈1070 keV	
14580	1^-									≈500 keV	02Cu04
15230(40)										≈300 keV	
15460										≈500 keV	02Cu04
15800	1^-						136(7)			700 keV	88Sm01
15950(30)										<50 keV	
16210(10)	$1^{\langle - \rangle}$										
16315(10)	$\langle 3,2 \rangle^-$									≈600 keV	02Cu04
16399(5)	2^-	2								<20 keV	
16880(30)	$4^-,2^-$	$\langle 1 \rangle$								<50 keV	
16948(10)	$\langle 3,2 \rangle^-$										
17025(10)	$\langle 3^- \rangle$	2								20(6) keV	
17050	$\langle 7^- \rangle$									≈350 keV	
17398(10)	1^-	$\langle 2 \rangle$								600 keV	
17450(10)	$\langle 1–3 \rangle^-$										
17460(30)	$\langle 4^- \rangle$	1								≈600 keV	
17500										≈150 keV	
17502(10)	$\langle 1–3 \rangle^-$										
17600(20)	$\langle 8^+ \rangle$										
17635(10)											
18049(10)											
18200										≈150 keV	
18450(20)	$\langle 3^- \rangle$	$\langle 1 \rangle$								75(27) keV	
18500										≈4300 keV	
18700(20)	$\langle 4^- \rangle$	2								<20 keV	

(continued) $^{18}_{8}$O

E^* [keV]	J^π	T	ℓ	S_{dp}	S_N (α,τ)	σ (α,τ) μb/sr	σ (^{6}Li,p) μb	σ (^{7}Li,p) μb	C^2S (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
18871(5)	1^+	2									
18927(10)	$\langle 1,2^+\rangle$										
18950	$\langle 7^-\rangle$									≈350 keV	
19027(10)	$\langle 1,3\rangle^-$										
19150(10)	$1^-,2^+,3^-$										
19240(20)	$\langle \geq 3\rangle$	2								<20 keV	
19400	1^-	$\langle 2\rangle$								900 keV	
19700										≈200 keV	
20200										≈180 keV	
20360(20)	$\langle 4^-\rangle$	2								<20 keV	
20860(20)										97(41) keV	
21000	1^-	$\langle 1\rangle$								≈150 keV	
21420(20)	$\langle 4^-\rangle$	$\langle 2\rangle$								<50 keV	
22400(20)	4^-	2								91(8) keV	
22700	1^-										
23100(20)										49(24) keV	
23800	1^-	$\langle 1\rangle$								≈1500 keV	
27000	1^-	$\langle 2\rangle$									
30000											
36000											
				76Li01	92Ya08	95Ti07	88Sm01	78Fo29	70Ka31		Ref.

Additional data on this isotope can be found in [04St10, 04To0A, 03Tr05, 02Tr11, 02Cu04, 02Ku22, 01Le23, 95Fo04, 93Ha17, 79Wo04, 76Kn07, 76Li01, 75Dr04].
Abundance: 0.200(14) %.
* not included in Adopted Levels [95Ti07]
** This state is clearly seen in the (α,^{2}He) reaction confirming its $(d_{5/2})^2$ character [78Ja10].
Only data for the levels with known spectroscopic factors are given for $E^* > 8$ MeV.
Data for this isotope are considered in vol. LB I/18A.

Energy levels and branching ratios [95Ti07]. Part 2 $^{18}_{8}$O

E^* [keV]	J^π	Branching ratios in percentage E^*_f: 0.0 J^π_f: 0^+	1982 2^+	3555 4^+	3634 0^+	3920 2^+	4455.54 1^-	5097.78 3^-	5254.8 2^+	5336.4 0^+	5377.8 3^+	6198.22 1^-
1982.07(9)	2^+	100										
3554.8(4)**	4^+		100									
3633.76(11)	0^+	0.30(6)	99.70(6)									
3920.44(14)	2^+	12.4(7)	87.6(7)									
4455.54(10)	1^-		27.1(26)		70.4(17)	2.5(9)						
5097.78(54)	3^-		76.1(8)	6.3(8)		17.6(7)						
5254.8(9)	2^+	30.3(9)	55.9(10)	1.1(6)	1.0(6)	8.7(4)	3.0(3)					
5336.4(6)	0^+	x	58(2)				42(2)					

(continued) $^{18}_{8}O$

E^* [keV]	J^π		Branching ratios in percentage										
		E_f^*:	0.0	1982	3555	3634	3920	4455.54	5097.78	5254.8	5336.4	5377.8	6198.22
		J_f^π:	0^+	2^+	4^+	0^+	2^+	1^-	3^-	2^+	0^+	3^+	1^-
5377.8(12)	3^+			86.5(22)			13.5(22)						
5530.24(29)	2^-			49(2)			24(2)	27(2)					
6198.22(40)	1^-		88.7(9)			2.5(3)		4.1(4)		3.6(4)	1.1(3)		
6351.3(6)	$\langle 2^- \rangle$			32(2)			56(2)	12(2)					
6404.4(12)	3^-			68.1(18)	7.4(12)		6.3(10)	2.8(10)	9.8(9)	5.6(9)			
6880.45(27)	0^-							100					
7116.9(12)	4^+			27.1(4)	69.2(7)		2.1(2)		1.3(2)	0.30(6)			
7615.9(7)	1^-		23(2)	62(3)				8(1)			6(1)		1(1)
7771.07(50)	2^-			53(3)				11(2)	36(3)				
7864(5)	5^-				[100]								
7977(4)	$\langle 3^+,4^- \rangle$				67(2)				12(2)			21(2)	
8037.8(7)	1^-		16(1)	70(2)		10(1)				4(1)			
8125(2)	5^-				99(1)				1(1)				
8213(4)	2^+		19(4)	29(3)	3(1)		3(1)	29(3)	17(1)				
8282(3)	3^-				61(3)			3(3)		36(3)			

Energy levels and branching ratios [95Ti07]. $^{19}_{8}O$

E^* [keV]	$2J^\pi$	L (d,p)	S_{dp}	σ (d,p) arb.u	L (t,p)	σ (t,p) arb.u	σ (α,τ) μb	S_N (α,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
0.0	5^+	2	0.57		0	10.5	2600	0.90	26.88(5) s	92Ya08
96.0(5)	3^+	2	0.01	0.28	2	1.75	190	0.09	1.39(5) ns	92Ya08
1471.7(4)	1^+	0	1.00	66.0	2	0.42	80	0.86	0.88(12) ps	92Ya08
2371.5(10)	9^+	2		<0.02		1.5			>2.4 ps	66Wi05
2779.0(9)	7^+	⟨2⟩		<0.1	2	4.4			64(13) fs	66Wi05
3067.4(16)	$\langle 3 \rangle^+$			<0.06		0.5	30	0.03	≥0.7 ps	92Ya08
3153.5(17)	5^+	2	0.06	1.02		4.2	60	0.03	≥0.7 ps	92Ya08
3231.6(23)	$1,3^-$			1.00		<0.04	50	0.05		92Ya08
3944.9(14)	3^-	1	0.11	4.6		0.31				66Wi05
4109.3(19)	3^+	2	0.33	0.7	⟨2⟩	0.49			<15 keV	66Wi05
4328.1(24)	3,5			<0.12		<0.17			<15 keV	66Wi05
4402.5(27)	3–7					0.45			<15 keV	66Wi05
4582.0(46)	3^-	1	0.15	2.8		<0.21			52(3) keV	66Wi05
4702.6(27)	5^+	2	0.02	<0.4		1.0	90	0.07	<15 keV	92Ya08
4968.3(55)	5,7					0.55				66Wi05
5007.0(45)	3,5								<15 keV	
5082.0(54)	1^-								49(5) keV	
5148.4(32)	$\geq 5^+$	2	0.08	1.0	[0]	9.0			3.4(10) keV	66Wi05
5384.0(28)	9–13									
5455(10)	$[3^+]$		[0.2]	28.0					320(25) keV	66Wi05
5503.5(31)						0.8			<15 keV	66Wi05

(continued) $^{19}_{8}$O

E^* [keV]	$2J^\pi$	L (d,p)	S_{dp}	σ (d,p) arb.u	L (t,p)	σ (t,p) arb.u	σ (α,τ) μb	S_N (α,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
5540	3^+	2	0.85				180	0.43	≈490 keV	92Ya08
5704.6(43)	7^-,5	2	0.17	1.8			140	0.05	7.8(14) keV	92Ya08
6119.6(32)	3^+								≈110 keV	
6191.6(55)										
6269.3(26)	7^-	3	0.13	4.0			310	0.13	19.2(24) keV	92Ya08
6405.8(31)										
6466.2(48)	7–11									
6583(6)										
6903(8)										
6988(9)										
7118(10)										
7242(8)										
7508(10)										
8048(20)										
8132(20)										
8247(20)										
8450(20)										
8561(20)										
8591(20)										
8916(20)										
8923(20)										
9022(20)										
9064(20)										
9253(20)										
9324(20)										
9430										
9560										
9600	7^-									
9900	7^-									
9930										
9980										
10210	7^-									
10660	7^-									
11250(50)									240 keV	
11580(50)									330 keV	
			95Ti07	66Wi05		66Wi05	92Ya08			Ref.
			66Wi05		78Aj03		95Ti07			Ref.

Additional data on this isotope can be found in [04St10, 03StZY, 02Ka34].
Five independent measurements of the (d,p) and (t,p) cross sections were considered in [78Aj03]; values L and S_{dp} are from this compilation (see references there).

Energy levels and branching ratios [95Ti07]. Part 2

$^{19}_{8}$O

E^* [keV]	$2J^\pi$	Branching ratios in percentage E_f^*: / $2J_f^\pi$:	0.0 5^+	96.0 3^+	1471.7 1^+
96.0(5)	3^+		100		
1471.7(4)	1^+		2.0(2)	98.0(2)	
2371.5(10)	9^+		100		
2779.0(9)	7^+		100		
3067.4(16)	$\langle 3\rangle^+$				100
3153.5(17)	5^+		8(4)	92(4)	
3944.9(14)	3^-		33(8)	39(8)	28(4)

Energy levels and branching ratios [98Ti06].

$^{20}_{8}$O

E^* [keV]	J^π	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage E_f^*: / J_f^π:	0.0 0^+
0.0	0^+	13.51(5) s			
1673.7(2)	2^+	7.3(3) ps			100
3570(7)*	4^+				
4072(4)	2^+				
4456(5)	0^+				
4850(15)	4^+				
5002(6)					
5234(5)	2^+				
5304(6)	2^+				
5350	1^-		02Tr11		
5387(6)	0^+				
5614(3)	$\langle 3^-\rangle$				
6555(8)	$\langle 2\rangle$				
6850	1^-		02Tr11		
7252(8)	5^-				
7622(7)	$3^-,4^+$				
7754(5)*	4^+				
7855(6)	$\langle 5^-\rangle$				
8554(8)	4^+				
8804(9)*	3^-				
8962(21)	$\langle 0^+\rangle$				
9770(8)	0^+				
10125(11)	2^+				

Additional data on this isotope can be found in [04St10, 04St08, 03Tr05, 03StZY, 02Tr11, 01Tr10, 01Be09, 98KhZY].

* This state is clearly seen in the (α,^{2}He) reaction [78Ja10].