

Table 19.6 from (1978AJ03): Energy levels of ^{19}F ^a

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
0	$\frac{1}{2}^+; \frac{1}{2}$	$\frac{1}{2}^+$	stable		1, 3, 4, 7, 8, 12, 13, 14, 15, 17, 18, 20, 22, 23, 28, 29, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60
0.109894 ± 0.005	$\frac{1}{2}^-$	$\frac{1}{2}^-$	$\tau_m = 0.853 \pm 0.010$ nsec	γ	8, 12, 13, 14, 15, 23, 29, 31, 32, 33, 39, 40, 42, 45, 55, 58
0.19724 ± 0.19	$\frac{5}{2}^+$	$\frac{1}{2}^+$	128.8 ± 1.5 nsec $\mu = +3.60$ n.m. $Q = 0.11$ b	γ	8, 12, 13, 14, 15, 23, 29, 32, 39, 40, 41, 42, 44, 45, 55, 58
1.34567 ± 0.13	$\frac{5}{2}^-$	$\frac{1}{2}^-$	4.8 ± 0.5 psec	γ	8, 13, 14, 15, 23, 29, 39, 40, 41, 43, 45
1.4587 ± 0.3	$\frac{3}{2}^-$	$\frac{1}{2}^-$	75 ± 13 fsec	γ	8, 13, 14, 15, 23, 29, 33, 40, 41, 43, 45, 49, 55
1.5540 ± 0.2	$\frac{3}{2}^+$	$\frac{3}{2}^+$	$4.4^{+2.4}_{-2.0}$ fsec	γ	8, 13, 14, 15, 23, 28, 29, 32, 39, 40, 41, 43, 45, 54, 55
2.7798 ± 0.6	$\frac{9}{2}^+$	$\frac{1}{2}^+$	259 ± 30 fsec	γ	6, 8, 11, 13, 14, 15, 23, 29, 39, 40, 41, 45, 54, 55
3.9057 ± 0.8	$\frac{3}{2}^+$		9 ± 5 fsec	γ	8, 14, 15, 23, 28, 33, 41, 45, 54, 55
3.9987 ± 0.7	$\frac{7}{2}^-$	$\frac{1}{2}^-$	< 40 fsec	γ	8, 14, 15, 23, 28, 29, 39, 41, 45, 54, 55
4.0325 ± 1.2	$\frac{9}{2}^-$	$\frac{1}{2}^-$	71 ± 10 fsec	γ	8, 11, 13, 14, 15, 29, 39, 41, 45, 54, 55
4.3767 ± 0.7	$\frac{7}{2}^+$		< 11 fsec	γ	8, 13, 14, 15, 21, 28, 29, 32, 41, 45, 54, 55
4.5499 ± 0.8	$\frac{5}{2}^+$		< 50 fsec	γ	14, 25, 28, 29, 39, 41, 45, 55
4.5561 ± 0.5	$\frac{3}{2}^-$		17^{+10}_{-8} fsec	γ	14, 15, 28, 41, 45, 54, 55
4.647 ± 20	$\frac{13}{2}^+$	$\frac{1}{2}^+$	2.2 ± 0.3 psec	γ	11, 13, 14, 15, 23, 45, 55
4.6825 ± 0.7	$\frac{5}{2}^-$		15.4 ± 3.0 fsec	γ, α	8, 14, 28, 29, 41, 45, 54, 55
5.1053 ± 1.7	$\frac{5}{2}^+$		< 30 fsec	γ, α	8, 14, 15, 28, 29, 41, 45, 54, 55
5.337 ± 2	$\frac{1}{2}^+$		≤ 15 fsec	γ, α	8, 14, 15, 29, 41, 45, 54
5.425 ± 7	$\frac{7}{2}^-$			γ, α	8, 13, 14, 23, 29, 39, 41, 45, 54
5.465 ± 2	$\frac{7}{2}^+$	$\frac{1}{2}^+$	$\Gamma < 1$ keV	γ, α	8, 13, 14, 15, 21, 41, 45, 54
5.500 ± 3	$\frac{3}{2}^+$		$\Gamma = 4 \pm 1$	γ, α	8, 9, 15, 29, 41, 45
5.54 ± 5	$\frac{5}{2}^+$			γ, α	8, 29, 41, 45, 54
5.623 ± 3	$\frac{3}{2}^-$		$\tau_m < 45$ fsec	γ, α	8, 28, 41, 45, 54, 55
5.939 ± 3	$\frac{1}{2}^+$			γ, α	8, 29, 41, 55
6.070 ± 1	$\frac{7}{2}^+$		$\Gamma = 1.2$	γ, α	8, 9, 15, 41, 54
6.090 ± 3	$\frac{3}{2}^-$		4	γ, α	8, 9, 13, 15, 29, 41, 54, 55

Table 19.6 from (1978AJ03): Energy levels of ^{19}F ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
6.160 \pm 1	$\frac{7}{2}^-$			γ, α	8, 29, 41, 55
6.252 \pm 6	$\frac{1}{2}^+$		8	α	9, 29, 41, 55
6.282 \pm 2	$\frac{5}{2}^+$		2.4	γ, α	8, 9, 13, 41
6.330 \pm 2	$\frac{7}{2}^+$		2.4	γ, α	8, 9, 41
6.429 \pm 8	$\frac{1}{2}^-$		280	α	9
6.498 \pm 1.5	$\frac{3}{2}^+$			γ, α	8, 15, 29, 55
6.500 \pm 1.5	$\frac{11}{2}^+$			γ, α	8, 15, 21, 55
6.526 \pm 2	$\frac{3}{2}^+$		4	γ, α	8, 9, 13, 15
6.554 \pm 2	$\frac{7}{2}^-$		1.6	γ, α	8, 9
6.592 \pm 2	$\frac{9}{2}^+$			γ, α	8, 13, 29
6.785 \pm 2	$\frac{3}{2}^-$		2.4	γ, α	8, 9, 29, 54, 55
6.836 \pm 2	$\frac{5}{2}^+$		1.2	γ, α	8, 9
6.891 \pm 4	$\frac{3}{2}^-$		28	γ, α	8, 9, 15
6.925 \pm 2	$\frac{7}{2}^-$		2.4	γ, α	8, 9, 13, 29
7.00 \pm 10	$\frac{1}{2}^-$		51	α	9
7.11 \pm 10	$\frac{7}{2}^+$		32	α	9, 29
7.1662 \pm 0.7	$\frac{11}{2}^-$			γ, α	8, 29
7.265 \pm 10			$\lesssim 6$	α	9, 13, 15, 29
7.364 \pm 5	$(\frac{1}{2}^+)$			α	9, 29
7.538 \pm 2	$\frac{5}{2}^+; T = \frac{3}{2}$			γ, α	8, 9, 13, 29
7.56 \pm 10	$\frac{7}{2}^+$		$\lesssim 90$	α	9
7.660 \pm 2	$\frac{3}{2}^+; T = \frac{3}{2}$			γ, α	8, 29, 33, 57
7.702 \pm 5	$(\frac{3}{2}^-)$				29
7.73	$\frac{1}{2}^-$		$\lesssim 30$	α	9, 13, 15
7.79			$\lesssim 6$	α	9
7.90			$\lesssim 200$	α	9
7.929 \pm 3	$\frac{7}{2}^+, \frac{9}{2}$			γ, α	8, 13, 15
7.937 \pm 3	$\frac{11}{2}^+$			γ, α	8, 15, 21
8.015 \pm 5 ^b	$\frac{5}{2}^+$		($\lesssim 4$)	γ, α	8, 9, 29
8.086 \pm 5					29
8.135 \pm 5	$\frac{1}{2}^+$		$\lesssim 5$	α	9, 29
(8.16)			$\lesssim 50$	α	9
8.198 \pm 5	$(\frac{5}{2}^+)$		$\lesssim 8$	α	9, 29
8.255 \pm 5	$(\frac{5}{2}^+)$				29
8.288 \pm 2	$\frac{13}{2}^-$			γ, α	8, 11, 13, 29
8.310 \pm 5					29
(8.53 \pm 20)					15
8.591 \pm 1	$\frac{3}{2}$		2.0 \pm 0.1	γ, p	13, 23, 25, 29

Table 19.6 from (1978AJ03): Energy levels of ^{19}F ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
8.637	$\frac{1}{2}^+$		95	p	25
8.795 \pm 1.5	$\frac{1}{2}^+; T = \frac{3}{2}$		45 \pm 1	γ, p, α	23, 25, 27, 29
8.928 \pm 0.8	$\frac{3}{2}^-$		3.6 \pm 0.2	p, α	13, 15, 25, 27
8.957 \pm 2	$\frac{11}{2}^+$			γ, α	8, 11, 15
9.099 \pm 1	$\frac{7}{2}^+; T = \frac{3}{2}$		$(24 \pm 23) \times 10^{-3}$	γ, p, α	23, 25, 27, 29
9.167 \pm 1	$\frac{1}{2}^+$		5.8 \pm 0.3	p, (α)	25, 27, 29
9.27	$\frac{11}{2}^+$			γ, α	8
9.321 \pm 1	$\frac{1}{2}^+$		4.9 \pm 0.2	γ, p, α	9, 13, 23
9.527 \pm 6	$(\frac{5}{2})$		29	p, α	15, 25, 27
9.573 \pm 6	$\frac{3}{2}^-$		26	p, α	25, 27, 29
9.668 \pm 2	$\frac{3}{2}^+$		3.8 \pm 1.0	γ, p, α	23, 25, 27, 29
9.819 \pm 0.8	$\frac{5}{2}^-$		0.29 \pm 0.05	γ, p, α	15, 23, 25, 27
9.872	$\frac{11}{2}^-$			γ, α	8, 13
9.888 \pm 4	$\frac{1}{2}^+$		29	p, α	25, 27
(9.898 \pm 2)					13
10.136 \pm 0.8	$\frac{3}{2}^-$		4.7 \pm 1.0	γ, p	23, 27
10.161 \pm 3	$\frac{1}{2}^+$		31	p, α	25, 27
10.231 \pm 3	$\frac{1}{2}^+$		4.3	(γ), p, α	23, 25, 27
10.253 \pm 3	$\frac{3}{2}^+$		22	(γ), p, α	23, 25, 27, 29
10.307 \pm 4	$\frac{3}{2}^+$		9.2	(γ), p, α	15, 25, 27, 29
10.411 \pm 3	$\frac{13}{2}^+$		< 1	γ, α	8, 13, 15
10.496 \pm 1	$\frac{9}{2}^+$		4.3	(γ), n, p, α	23, 24, 25, 27, 29
10.542			2.5 \pm 0.2	(γ), n, p	23, 24, 29
10.555 \pm 3	$\frac{3}{2}^{(+)}; (\frac{3}{2})$		8 \pm 2	(γ), p, α	23, 25, 27
10.566 \pm 1				n, p	24
10.580 \pm 4	$(\frac{5}{2}^+)$		22 \pm 3	(γ), p, α	23, 25, 27
10.613 \pm 1.6	$\frac{5}{2}^+; T = \frac{3}{2}$		4.7 \pm 0.5	(γ), n, p, α	23, 24, 25, 27
10.763 \pm 3	$\frac{1}{2}^-$		6 \pm 3	n, p, α	13, 24, 25, 27
10.859 \pm 2	$\frac{5}{2}^+$		24.0 \pm 1.5	n, p, α	24, 25, 27
10.974 \pm 3	$(\frac{3}{2}, \frac{5}{2})^+$		14 \pm 2	n, p, α	24, 25, 27
10.989 \pm 2.5			7 \pm 2	n, p	24
11.071 \pm 2.5	$\frac{1}{2}^+$		35 \pm 4	n, p, α	24, 25, 27
11.187 \pm 4	$(\frac{1}{2}^-)$		17 \pm 4	n, p, α	24, 25, 27
11.217	$\frac{11}{2}^+$			γ, α	8
11.272 \pm 3			7 \pm 2	n, p	24
11.285 \pm 8	$\frac{5}{2}^+$		22 \pm 5	n, p, α	24, 25, 27
11.35 \pm 25	$\frac{1}{2}^+$		270 \pm 30	p	25
11.451 \pm 4	$\frac{1}{2}^-$		38 \pm 7	n, p, (α)	13, 24, 25, 27

Table 19.6 from (1978AJ03): Energy levels of ^{19}F ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
11.478 \pm 5			7 \pm 3	n, p	24, 25
11.502 \pm 5			4 \pm 2	n, p	24, 25
11.540 \pm 8	$\frac{5}{2}^+$		22 \pm 5	n, p, α	24, 25, 27
11.568 \pm 7	$(T = \frac{3}{2})$		15 \pm 10	n, p	24
11.602 \pm 12	$\frac{3}{2}^-$		63 \pm 7	p	25
11.652 \pm 4	$\frac{3}{2}^+; (\frac{3}{2})$		45 \pm 10	n, p, (α)	13, 24, 25, 27
11.84 \pm 10			< 50	n, p	24
11.93 \pm 10			90	n, p	24
12.06 \pm 30	$\frac{1}{2}^-$		70 \pm 25	(n), p, α	24, 25, 27
12.14 \pm 10	$\frac{3}{2}^-, T = \frac{3}{2}$		105 \pm 15	γ , n, p, (α)	24, 25, 27, 34
12.221 \pm 12	$\frac{3}{2}^+$		74 \pm 1	n, p, α	24, 25, 27
12.521 \pm 7	$\frac{1}{2}^-$		15 \pm 4	p	25
12.576 \pm 10	$\frac{5}{2}^+$		47 \pm 10	(n), p, α	24, 25, 27
12.58 \pm 25	$\frac{1}{2}^-; T = \frac{3}{2}$		285 \pm 50	p	25
12.78 \pm 10	$\frac{5}{2}^+; T = \frac{3}{2}$		95 \pm 40	n, p, (α)	13, 24, 25, 27
12.86 \pm 30	$\frac{3}{2}^+; T = \frac{3}{2}$		275 \pm 40	p	25
12.94 \pm 25	$\frac{5}{2}^+$		70 \pm 25	p, α	25, 27
12.98 \pm 50	$\frac{1}{2}^-$		125 \pm 40	p	25
13.068 \pm 4	$\frac{1}{2}^+$		\leq 10	n, p, t	12, 24
13.09 \pm 75	$\frac{3}{2}^-$		285 \pm 70	p	25
13.17 \pm 15			70	n, p	24
13.245 \pm 10	$\frac{1}{2}^-$		7	t	12
13.270 \pm 10	$\frac{1}{2}^+$		4.5	t	12
13.317 \pm 6	$\frac{7}{2}^-; (\frac{3}{2})$		28 \pm 6	n, p, α	24, 25, 27
13.36 \pm 25	$\frac{3}{2}^-$		40 \pm 20	p	25
13.532 \pm 10	$\frac{1}{2}^+$		22	t	12
13.731 \pm 11	$\frac{7}{2}^-; T = \frac{3}{2}$		52 \pm 10	n, p, (α)	24, 25, 27
13.878 \pm 15	$\frac{1}{2}^+$		101	γ , n, t	12, 34
14.147 \pm 20	$\frac{1}{2}^+$		21	t	12, 13
14.24 \pm 15			350	n, p, α	24, 25, 27
14.255 \pm 15	$\frac{3}{2}^+$		51	t	12
14.352 \pm 10	$\frac{1}{2}^+$		154	t	12
14.46 \pm 25	$\frac{3}{2}^+$		179	t	12
14.46 \pm 25	$\frac{5}{2}^+$		46	t	12
14.78 \pm 20			300	n, p	24
15.00 \pm 20				n, p	13, 24
15.75 \pm 25			150	n, p	24
16.27 \pm 25			200	γ , n, p	24, 34

Table 19.6 from (1978AJ03): Energy levels of ^{19}F ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
16.80 \pm 30				n, p	24
17.9				p, α	25, 27

^a See also Tables [19.7](#) and [19.10](#).

^b I am particularly indebted for the comments by Prof. C. Rolfs on the states near the proton binding energy.