Table 19.6 from (1987AJ02): Energy levels of ^{19}F [a]

E_x (MeV ± 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		7, 9, 10, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 28, 29, 30, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53
0.109894 ± 0.005	$\frac{1}{2}^-$	$\frac{1}{2}^-$	$\tau_m = 0.853 \pm 0.010$ nsec	γ	7, 9, 13, 15, 16, 21, 23, 29, 30, 33, 34, 35, 37, 40, 49, 51, 53
0.197143 ± 0.004	$\frac{5}{2}^+$	$\frac{1}{2}^+$	128.8 ± 1.5 nsec $\|g\| = 1.441 \pm 0.003$	γ	6, 7, 10, 13, 14, 15, 16, 21, 22, 23, 29, 30, 34, 35, 36, 37, 40, 42, 44, 49, 51
1.34567 ± 0.13	$\frac{5}{2}^-$	$\frac{1}{2}^-$	4.13 ± 0.06 psec $\|g\| = 0.27 \pm 0.04$	γ	7, 9, 10, 14, 15, 16, 21, 23, 29, 30, 34, 35, 36, 37, 40
1.4587 ± 0.3	$\frac{3}{2}^-$	$\frac{1}{2}^-$	90 ± 20 fsec	γ	9, 10, 15, 16, 21, 29, 33, 34, 35, 36, 37, 40, 44, 51
1.554038 ± 0.009	$\frac{3}{2}^+$	$\frac{1}{2}^+$	5 ± 3 fsec	γ	7, 14, 15, 16, 21, 22, 23, 28, 29, 30, 34, 35, 36, 37, 40, 42, 44, 49, 51
2.779849 ± 0.034	$\frac{9}{2}^+$	$\frac{1}{2}^+$	280 ± 30 fsec	γ	2, 3, 5, 7, 10, 12, 14, 15, 16, 19, 21, 22, 28, 29, 34, 35, 36, 40, 42, 44, 50, 51
3.90817 ± 0.20	$\frac{3}{2}^+$	$\frac{3}{2}^+$	9 ± 5 fsec	γ	7, 15, 16, 21, 23, 29, 30, 33, 34, 36, 40, 51
3.9987 ± 0.7	$\frac{7}{2}^-$	$\frac{1}{2}^-$	19 ± 7 fsec	γ	7, 15, 16, 21, 28, 29, 34, 36, 40, 51
4.0325 ± 1.2	$\frac{9}{2}^-$	$\frac{1}{2}^-$	67 ± 15 fsec	γ	7, 10, 14, 15, 16, 21, 28, 34, 36, 40, 51

Table 19.6 from (1987AJ02): 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
4.377700 ± 0.042	$\frac{7}{2}^+$	$\frac{3}{2}^+$	< 11 fsec	γ	7, 14, 15, 16, 21, 22, 23, 28, 29, 30, 34, 36, 40, 51
4.5499 ± 0.8	$\frac{5}{2}^+$	$\frac{3}{2}^+$	< 50 fsec	γ	7, 15, 16, 21, 23, 34, 36, 40, 51
4.5561 ± 0.5	$\frac{3}{2}^-$		17^{+10}_{-8} fsec	γ	7, 15, 16, 23, 28, 29, 34, 36, 40, 51
4.648 ± 1	$\frac{13}{2}^+$	$\frac{1}{2}^+$	3.7 ± 0.4 psec	γ	14, 15, 16, 21, 22, 23, 34, 40, 51
4.6825 ± 0.7	$\frac{5}{2}^-$		15.4 ± 3.0 fsec	γ, α	7, 15, 19, 21, 23, 28, 29, 34, 36, 40, 51
5.1066 ± 0.9	$\frac{5}{2}^+$		< 30 fsec	γ, α	7, 15, 16, 21, 23, 28, 29, 34, 36, 40, 51
5.337 ± 2	$\frac{1}{2}^{(+)}$		≤ 0.1 fsec	γ, α	7, 15, 16, 21, 23, 29, 34, 36, 40, 51
5.418 ± 1	$\frac{7}{2}^-$		$\Gamma = (2.6 \pm 0.7) \times 10^{-3}$	γ, α	3, 7, 15, 21, 23, 29, 34, 36, 40
5.4635 ± 1.5	$\frac{7}{2}^+$	$\frac{1}{2}^+$	$\tau_m \leq 0.26$ fsec	γ, α	7, 10, 14, 15, 16, 21, 22, 23, 34, 36, 40
5.5007 ± 1.7	$\frac{3}{2}^+$		$\Gamma = 4 \pm 1$ keV	γ, α	7, 8, 16, 21, 23, 34, 36, 40
5.535 ± 2	$\frac{5}{2}^+$			γ, α	7, 21, 23, 34, 36, 40, 51
5.621 ± 1	$\frac{5}{2}^-$		$\tau_m < 1.3$ fsec	γ, α	7, 21, 23, 28, 29, 34, 36, 40, 50, 51
5.938 ± 1	$\frac{1}{2}^+$			γ, α	7, 23, 28, 29, 34, 36, 51
6.070 ± 1	$\frac{7}{2}^+$		$\Gamma = 1.2$	γ, α	7, 21, 34, 36
6.088 ± 1	$\frac{3}{2}^-$		4	γ, α	7, 10, 15, 16, 21, 23, 34, 36, 51
6.100 ± 2	$\frac{9}{2}^-$			γ	23, 34
6.1606 ± 0.9	$\frac{7}{2}^-$		$(3.7 \pm 1.0) \times 10^{-3}$	γ, α	3, 7, 23, 34, 36, 51
6.255 ± 1	$\frac{1}{2}^+$		8	α	8, 21, 23, 28, 29, 34, 36, 51
6.282 ± 2	$\frac{5}{2}^+$		2.4	γ, α	7, 8, 14, 21, 23, 28, 34, 36
6.330 ± 2	$\frac{7}{2}^+$		2.4	γ, α	7, 8, 10, 21, 34, 36

Table 19.6 from (1987AJ02): Energy levels of ^{19}F [a] (continued)

E_x (MeV ± keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
6.429 ± 8	$\frac{1}{2}^-$		280	α	8, 34
6.4967 ± 1.4	$\frac{3}{2}^+$			γ, α	7, 16, 21, 23, 29, 34
6.5000 ± 0.9	$\frac{11}{2}^+$	$\frac{3}{2}^+$		γ, α	7, 16, 22, 23, 34
6.5275 ± 1.4	$\frac{3}{2}^+$		4	γ, α	7, 14, 16, 21, 23, 34
6.554 ± 2	$\frac{7}{2}^{(+)}$		1.6	γ, α	7, 21, 34
6.592 ± 2	$\frac{9}{2}^+$	$\frac{3}{2}^+$	$(7.6 \pm 1.8) \times 10^{-3}$	γ, α	3, 7, 14, 21, 23, 29, 34
6.787 ± 2	$\frac{3}{2}^-$		$(6.9 \pm 1.1) \times 10^{-3}$	γ, α	7, 8, 21, 23, 29, 34
6.8384 ± 0.9	$\frac{5}{2}^+$		1.2	γ, α	7, 8, 21, 23, 34
6.891 ± 4	$\frac{3}{2}^-$		28	γ, α	7, 8, 21, 34
6.9265 ± 1.7	$\frac{7}{2}^-$		2.4	γ, α	7, 8, 10, 14, 15, 21, 23, 29, 34
6.989 ± 3	$\frac{1}{2}^-$		51	α	8, 23, 34
7.114 ± 6	$\frac{7}{2}^+$		32	α	8, 29, 34
7.1662 ± 0.7	$\frac{11}{2}^-$		$(6.9 \pm 1.1) \times 10^{-3}$	γ, α	3, 7, 23, 34
7.262 ± 2	$\frac{3}{2}^+$		< 6	α	8, 14, 15, 16, 23, 28, 29, 34, 42
7.364 ± 4	$\frac{1}{2}^+$			α	16, 23, 28, 29, 34
7.5396 ± 0.9	$\frac{5}{2}^+; \frac{3}{2}$		(c)	γ, α	7, 8, 10, 14, 23, 29, 34
7.56 ± 10	$\frac{7}{2}^+$		< 90	α	8
7.587	$(\frac{5}{2}^-)$			γ	34
7.6606 ± 0.9	$\frac{3}{2}^+; \frac{3}{2}$			γ, α	7, 23, 29, 33, 34, 52
7.702 ± 5	$\frac{1}{2}^-$		< 30	α	8, 14, 23, 29, 34
7.74 ± 40	$(\frac{5}{2}, \frac{7}{2})^-$		< 6		34, 42
(7.90)			< 200	α	8
7.929 ± 3	$\frac{7}{2}^+; \frac{9}{2}$			γ, α	7, 14, 16
7.937 ± 3	$\frac{11}{2}^+$			γ, α	7, 22
8.0140 ± 1.0	$\frac{5}{2}^+$			p	29
8.084 ± 3			≤ 3	p, α	8, 27, 29
8.1377 ± 1.2	$\frac{1}{2}^+$		≤ 0.3	γ, p, α	8, 23, 27, 28, 29
(8.16)			< 50	α	8
8.1990 ± 1.0	$(\frac{5}{2}^+)$		≤ 1	γ, p, α	8, 23, 27, 29
8.2543 ± 2.6	$(\frac{5}{2}, \frac{7}{2})^-$		≤ 1.5	γ, p	23, 29, 42

Table 19.6 from (1987AJ02): Energy levels of ^{19}F [a] (continued)

E_x (MeV ± keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
8.288 ± 2	$\frac{13}{2}^-$	$(\frac{1}{2}^-)$	< 1 [c]	γ, α	3, 7, 8, 9, 10, 11, 12, 14, 15
8.3100 ± 1.2	$\frac{5}{2}^+$		0.047 ± 0.019	γ, p, α	7, 23, 27, 29
8.370 ± 4	$\frac{7}{2}, \frac{5}{2}^+$		7.5 ± 1.5	γ, α	7
8.5835 ± 1.6	$\frac{5}{2}^+$		≤ 0.5	γ, p, α	7, 23
8.5919 ± 1.0	$\frac{3}{2}^-$		2.0 ± 0.1	γ, p, α	7, 14, 23, 25, 27, 29
8.629 ± 4	$\frac{7}{2}^-$		< 1 [c]	γ, α	7, 8, 42
8.65	$\frac{1}{2}^+$		≈ 300	γ, p, α	23, 25, 27
8.7932 ± 1.5	$\frac{1}{2}^+; \frac{3}{2}$		46 ± 2	γ, p	23, 25, 27, 29
8.864 ± 4	$< \frac{9}{2}$		≈ 1	γ, α	7
8.9267 ± 2.8	$\frac{3}{2}^-$		3.6 ± 0.2	γ, p, α	14, 15, 23, 25, 27
8.953 ± 3	$\frac{11}{2}^-$		≈ 1 [c]	γ, α	3, 7, 8, 9, 10, 11, 12
9.030 ± 5	$\frac{5}{2}, \frac{7}{2}$		4.2 ± 1	γ, α	7
9.0997 ± 0.7	$\frac{7}{2}^-$		0.57 ± 0.03	γ, p, α	7, 23, 25, 27
9.101 ± 4	$\frac{7}{2}^+, \frac{9}{2}^+$		≈ 1	γ, α	7, 29
9.167 ± 1.4	$\frac{1}{2}^+$		6.2 ± 0.5	γ, p, α	7, 25, 27, 29
9.204 ± 7	$\frac{3}{2}$		10.2 ± 1.5	γ, α	7
9.267 ± 4	$\frac{11}{2}^+, \frac{9}{2}^+$		2 ± 1	γ, α	7
9.280 ± 5	$(\frac{7}{2}, \frac{9}{2})^+$		< 1.5	γ, α	7, 42
9.318 ± 2	$\frac{3}{2}^+$		3.4 ± 0.7	γ, p, α	7, 14, 23
9.321 ± 1.1	$\frac{1}{2}^+$		5.0 ± 0.2	p, α	25, 27
9.329 ± 4	$< \frac{5}{2}$		≈ 6	γ, α	7
9.509 ± 4	$\frac{5}{2}^+, \frac{7}{2}^+$ [c]		< 1 [c]	γ, α	7, 8
9.527 ± 6	$(\frac{5}{2})$		28	p, α	25, 27
9.5364 ± 2.0	$\frac{5}{2}^+$		6.3 ± 1.5	γ, p, α	7, 23
9.566 ± 3	$\frac{3}{2}^-$		26 ± 3	γ, p	23
9.575 ± 4	$\frac{3}{2}^-$		67 ± 3	γ, p, α	23, 25, 27
9.586 ± 3	$\frac{7}{2}$		8.9 ± 1.2	γ, p, α	7, 23, 29
9.642 ± 6	$\frac{3}{2}, \frac{5}{2}$		≈ 8	γ, α	7
9.654 ± 6	$\frac{3}{2}, \frac{5}{2}$		≈ 6	γ, α	7
9.6675 ± 1.5	$\frac{3}{2}^+$		3.6 ± 0.4	γ, p, α	7, 23, 25, 27, 29
9.710 ± 4	$\frac{9}{2}^+, \frac{11}{2}^-$ [c]		< 1 [c]	γ, α	3, 7, 8, 14
9.820 ± 1.0	$\frac{5}{2}^-$		0.3 ± 0.05	γ, p, α	7, 23, 25, 27

Table 19.6 from (1987AJ02): Energy levels of ^{19}F [a] (continued)

E_x (MeV ± keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
9.834 ± 3	$\frac{11}{2} \rightarrow \frac{15}{2}$		< 1 [c]	γ, α	7, 8
9.8740 ± 1.8	$\frac{11}{2}^-$		$(2.6 \pm 0.6) \times 10^{-3}$	γ, p, α	3, 7, 8, 14, 15, 23
9.887 ± 3	$\frac{1}{2}^+$		25 ± 2	γ, p, α	23, 25, 27
9.926 ± 3	$\frac{9}{2}^+$ [c]		≈ 1 [c]	γ, α	3, 7, 8
10.088 ± 5	$\frac{5}{2}^-, \frac{7}{2}^-$ [c]		< 1.5 [c]	γ, α	7, 8, 10
10.137 ± 0.8	$\frac{3}{2}^-$		4.3 ± 0.6	γ, p, α	7, 23, 27
10.162 ± 3	$\frac{1}{2}^+$		31	p, α	25, 27
10.232 ± 3	$\frac{1}{2}^+$		< 1	p, α	8, 25, 27
10.254 ± 3	$\frac{1}{2}^+$		22	p, α	25, 27
10.308 ± 4	$\frac{3}{2}^+$		9.2	p, α	8, 16, 25, 27
10.365 ± 4	$\frac{7}{2} \rightarrow \frac{11}{2}$		3 ± 1.5	γ, α	7, 29
10.411 ± 3	$\frac{13}{2}^+$	$\frac{3}{2}^+$	< 1.5 [c]	γ, α	3, 7, 8, 10, 14, 15, 16, 23, 50
10.469 ± 4			11.0 ± 1.2	p, α	8
10.488 ± 4			4.8 ± 0.8	p, α	8
10.4963 ± 1.3	$\frac{3}{2}^+$		5.7 ± 0.6	n, p, α	8, 24, 25, 27
10.521 ± 4			14 ± 2	p, α	8, 29
10.5423 ± 1.1			2.5 ± 0.2	n, p, α	8, 24
10.555 ± 3	$\frac{3}{2}^+; (\frac{3}{2})$		4.0 ± 1.2	p, α	8, 25, 27
10.5647 ± 2.0			4.6 ± 0.7	n, p, α	8, 24
10.581 ± 4	$(\frac{5}{2}^+)$		22 ± 3	p, α	25, 27
10.6143 ± 1.6	$\frac{5}{2}^+; \frac{3}{2}$		4.7 ± 0.5	n, p, α	24, 25, 27
10.7633 ± 2.5	$\frac{1}{2}^-$		6 ± 3	n, p, α	14, 24, 25, 27
10.8597 ± 1.9	$\frac{5}{2}^+$		24.0 ± 1.5	n, p, α	24, 25, 27
10.927 ± 8				γ	3
10.9750 ± 2.5	$(\frac{3}{2}, \frac{5}{2})^+$		14 ± 2	n, p, α	24, 25, 27
10.989 ± 2.5			7 ± 2	n, p	24
11.072 ± 2.7	$\frac{1}{2}^+$		35 ± 4	n, p, α	24, 25, 27
11.188 ± 4	$(\frac{1}{2}^-)$		17 ± 4	n, p, α	24, 25, 27
11.273 ± 3			7 ± 2	n, p	24
11.286 ± 7	$\frac{5}{2}^+$		22 ± 5	n, p, α	24, 25, 27
11.35 ± 25	$\frac{1}{2}^+$		272 ± 31	p	25
11.450 ± 3.5	$\frac{1}{2}^-$		38 ± 7	n, p, (α)	14, 24, 25, 27

Table 19.6 from (1987AJ02): Energy levels of ^{19}F [a] (continued)

E_x (MeV ± keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
11.478 ± 5			7 ± 3	n, p	24
11.502 ± 5	$(\frac{3}{2}^-)$		4 ± 2	n, p, α	24, 25, 27
11.540 ± 7	$\frac{5}{2}^+$		22 ± 5	n, p, α	24, 25, 27
11.569 ± 7	$(T = \frac{3}{2})$		15 ± 10	n, p	24
11.603 ± 12	$\frac{3}{2}^-$		63 ± 7	n, p	24, 25
11.653 ± 4	$\frac{3}{2}^+; (\frac{3}{2})$		33 ± 6	n, p, (α)	10, 14, 24, 25, 27
11.84 ± 10			< 50	n, p	24
11.93 ± 10			90	n, p	24
12.04 ± 20	$\frac{1}{2}^-$		71 ± 24	p, α	10, 25, 27
12.136 ± 8	$\frac{3}{2}^-; \frac{3}{2}$		105 ± 14	n, p, (α)	24, 25, 27
12.222 ± 12	$\frac{3}{2}^+$		74 ± 1	n, p, α	24, 25, 27
12.522 ± 7	$\frac{1}{2}^-$		15 ± 4	p	25
12.577 ± 10	$\frac{5}{2}^+$		48 ± 10	p, α	25, 27
12.58 ± 25	$\frac{1}{2}^-; \frac{3}{2}$		285 ± 48	p	25
12.78 ± 10	$\frac{5}{2}^+; \frac{3}{2}$		95 ± 38	n, p, (α)	14, 24, 25, 27
12.86 ± 30	$\frac{3}{2}^+; \frac{3}{2}$		276 ± 38	p	25
12.94 ± 25	$\frac{5}{2}^+$		71 ± 24	p, α	25, 27
12.98 ± 50	$\frac{1}{2}^-$		124 ± 38	p	25
13.068 ± 4	$\frac{1}{2}^+$		≤ 10	n, p, t	13, 24
13.09 ± 75	$\frac{3}{2}^-$		285 ± 71	p	25
13.17 ± 15			70	n, p	24
13.245 ± 10	$\frac{1}{2}^-$		7	t	13
13.270 ± 10	$\frac{1}{2}^+$		4.5	t	13
13.317 ± 8	$\frac{7}{2}^-; (\frac{3}{2})$		28 ± 6	n, p, α	24, 25, 27
13.36 ± 25	$\frac{3}{2}^-$		38 ± 19	p	25
13.532 ± 10	$\frac{1}{2}^+$		22	t	13
13.732 ± 11	$\frac{7}{2}^-; \frac{3}{2}$		52 ± 10	n, p, (α)	15, 24, 25, 27
13.878 ± 15	$\frac{1}{2}^+$		101	t	13
14.04 ± 20	$\frac{5}{2}^+$		141 ± 28	p	25
14.10 ± 21	$\frac{3}{2}^-$		84 ± 28	p	10, 15, 25
14.147 ± 20	$\frac{1}{2}^+$		21	t	13
14.24 ± 15			350	n, p	24
14.255 ± 15	$\frac{3}{2}^+$		51	t	13

Table 19.6 from (1987AJ02): Energy levels of ^{19}F [a] (continued)

E_x (MeV ± keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
14.33 ± 20	$\frac{3}{2}^-$		76 ± 28	p	25
14.352 ± 10	$\frac{1}{2}^+$		154	t	13
14.46 ± 25	$\frac{3}{2}^+$		179	t	13
14.46 ± 25	$\frac{5}{2}^+$		46	t	13
14.70 ± 20	$\frac{3}{2}^-$		124 ± 38	p	25
14.72 ± 70	$\frac{1}{2}^-$		257 ± 67	α	27
14.74 ± 50	$\frac{1}{2}^+$		361 ± 67	p, α	25, 27
14.78 ± 20	$\frac{5}{2}^+$			n, p	24, 25
14.92 ± 30	$\frac{7}{2}^-$			p	10, 15, 25
15.00 ± 20				n, p	24
15.36 ± 20	$\frac{1}{2}^-$			p	25
15.40 ± 30	$\frac{5}{2}^+$			p	25
15.56 ± 30					15
15.77 ± 21	$\frac{3}{2}^-$		150	n, p	24
16.09 ± 50					10
16.20 ± 40	$\frac{3}{2}^+$			p	25
16.23 ± 30	$\frac{7}{2}^-$			p	25
16.28 ± 20	$\frac{3}{2}^-$		200	n, p	24, 25
16.45 ± 50					10
16.80 ± 30				n, p	24
17.05 ± 40	$\frac{3}{2}^-$		331 ± 67	p	25
17.16 ± 40	$\frac{7}{2}^-$		323 ± 67	p	25
17.45 ± 30	$\frac{3}{2}^-$		32 ± 19	p	10, 25
17.65 ± 60	$\frac{7}{2}^-$		95 ± 57	p	25
17.93 ± 40	$\frac{3}{2}^-$		255 ± 57	p	25
18.03 ± 60	$\frac{7}{2}^-$		365 ± 57	p	10, 25
18.92 ± 30					10
19.07 ± 60	$\frac{3}{2}^-$		555 ± 143	p	25
19.83 ± 150	$\frac{5}{2}^-$		369 ± 57	p	25
19.89 ± 30	$\frac{3}{2}^-$		473 ± 57	p	10, 25
20.81 ± 50	$\frac{1}{2}^-$		412 ± 57	p	25
20.93 ± 50	$\frac{3}{2}^-$		317 ± 48	p	25
21.05 ± 40 [b]	$\frac{7}{2}^-$		448 ± 29	p	25

[a] See also Tables 19.7 and 19.8.
[b] For evidence of additional states see reaction 32.
[c] See Table 19.11.