

Table 20.2 from (1987AJ02): Energy levels of  $^{20}\text{F}$  <sup>a</sup>

$E_x$ (MeV $\pm$ keV)	$J^\pi; T$	$\tau$	Decay	Reactions
0	$2^+; 1$	$\tau_{1/2} = 11.00 \pm 0.02$ sec	$\beta^-$	1, 2, 4, 6, 7, 9, 10, 11, 14, 16, 17, 19, 20
0.65600 $\pm$ 0.04	$3^+$	$\tau_m = 0.39 \pm 0.03$ psec	$\gamma$	6, 7, 9, 10, 11, 14, 19
0.82268 $\pm$ 0.08	$4^+$	$79 \pm 6$ psec	$\gamma$	5, 6, 7, 9, 10, 11, 14, 17, 19
0.98371 $\pm$ 0.05	$1^-$	$2.0 \pm 0.2$ psec	$\gamma$	6, 7, 9, 11, 14, 17, 19
1.056818 $\pm$ 0.004	$1^+$	$45 \pm 13$ fsec	$\gamma$	6, 7, 9, 10, 11, 14, 15, 16, 17, 19
1.30934 $\pm$ 0.05	$2^-$	$1.6 \pm 0.3$ psec	$\gamma$	6, 7, 9, 11, 14, 16, 17, 19
1.8244 $\pm$ 1.2	$5^+$	$\leq 65$ fsec	( $\gamma$ )	2, 6, 9, 10, 14, 19
1.84397 $\pm$ 0.08	$2^-$	$30 \pm 20$ fsec	$\gamma$	2, 7, 9, 11, 14, 17
1.97080 $\pm$ 0.07	( $3^-$ )		$\gamma$	2, 5, 6, 7, 9, 11, 14, 19
2.04405 $\pm$ 0.06	$2^+$	$37 \pm 16$ fsec	$\gamma$	2, 6, 7, 9, 11, 14, 17, 19
2.19436 $\pm$ 0.08	( $3^+$ )	$< 12$ fsec	$\gamma$	2, 6, 7, 9, 10, 11, 14, 17, 19
2.8649 $\pm$ 1.5	( $3^-$ )		( $\gamma$ )	6, 7, 9, 14, 19
2.96616 $\pm$ 0.08	$3^+$	$60 \pm 40$ fsec	$\gamma$	6, 7, 9, 11, 14, 19
2.968 $\pm$ 1.5	( $4^-$ )		( $\gamma$ )	5, 6, 7, 19
3.17258 $\pm$ 0.42	( $1^+$ )		$\gamma$	6, 7, 9, 11, 14, 19
3.48849 $\pm$ 0.06	$1^+$	$44 \pm 11$ fsec	$\gamma$	6, 7, 9, 11, 14, 15, 19
3.52628 $\pm$ 0.07	$0^+$	$30 \pm 15$ fsec	$\gamma$	9, 11, 14
3.58656 $\pm$ 0.09	(1, 2) <sup>+</sup>	$\leq 60$ fsec	$\gamma$	6, 7, 9, 11, 14, 19
3.68013 $\pm$ 0.06	1, 2		$\gamma$	6, 7, 9, 11, 14, 19
3.7611 $\pm$ 1.9	( $2^-, 3^+$ )		( $\gamma$ )	6, 7, 9, 14, 19
3.96519 $\pm$ 0.16	$1^+$		$\gamma$	6, 7, 9, 11, 14, 19
4.08208 $\pm$ 0.11	(1) <sup>+</sup>		$\gamma$	6, 7, 9, 11, 14, 19
4.1989 $\pm$ 2.7			( $\gamma$ )	6, 14

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$E_x$ (MeV $\pm$ keV)	$J^\pi; T$	$\tau$	Decay	Reactions
4.2077 $\pm$ 2.6			( $\gamma$ )	7, 14, 19
4.27722 $\pm$ 0.14	(1, 2) <sup>+</sup>		$\gamma$	6, 7, 11, 14, 19
4.3154 $\pm$ 2.0	(0, 1) <sup>+</sup>		( $\gamma$ )	14
4.37138 $\pm$ 0.12	(2 <sup>+</sup> )		$\gamma$	6, 7, 11, 14, 19
4.5087 $\pm$ 0.4	1 <sup>+</sup> (2)		$\gamma$	6, 7, 11, 14, 19
4.5808 $\pm$ 1.8			( $\gamma$ )	6, 7, 14
4.5922 $\pm$ 2.9			( $\gamma$ )	14, 19
4.7310 $\pm$ 2.0	(3 <sup>-</sup> , 4 <sup>-</sup> , 4 <sup>+</sup> , 5 <sup>+</sup> )		( $\gamma$ )	6, 7, 14, 19
4.7656 $\pm$ 2.0			( $\gamma$ )	6, 7, 14, 19
4.8916 $\pm$ 2.8			( $\gamma$ )	6, 14, 19
4.8982 $\pm$ 2.8			( $\gamma$ )	7, 14
5.047 $\pm$ 4	(2) <sup>-</sup>		( $\gamma$ )	6, 14, 19
5.068 $\pm$ 3	(1 <sup>-</sup> , 2, 3 <sup>+</sup> )		( $\gamma$ )	6, 14
5.1310 $\pm$ 2.5	(2 <sup>-</sup> , 3, 4 <sup>+</sup> )		( $\gamma$ )	6, 14, 19
5.2239 $\pm$ 2.3	(1, 2) <sup>-</sup>		( $\gamma$ )	6, 7, 14, 19
5.2819 $\pm$ 2.5			( $\gamma$ )	6, 14, 19
5.31887 $\pm$ 0.17	0, 1, 2		$\gamma$	6, 11, 14, 19
5.349 $\pm$ 0.4	(3) <sup>+</sup>		( $\gamma$ )	6, 14
5.4131 $\pm$ 0.6			$\gamma$	6, 7, 14, 19
5.4503 $\pm$ 3.8			( $\gamma$ )	14, 19
5.4554 $\pm$ 3.2			( $\gamma$ )	14
5.463 $\pm$ 3	(1, 2, 3) <sup>+</sup>		( $\gamma$ )	14
5.55534 $\pm$ 0.13	1, 2 <sup>+</sup>		$\gamma$	7, 11, 14, 19
5.5881 $\pm$ 1.5			( $\gamma$ )	14
5.620 $\pm$ 3			( $\gamma$ )	7, 14, 19
5.713 $\pm$ 2			$\gamma$	6, 14, 19
5.7640 $\pm$ 2.5	(3) <sup>+</sup>		( $\gamma$ )	6, 14, 19
5.8104 $\pm$ 2.5	(1 <sup>+</sup> )		( $\gamma$ )	6, 14, 19
5.93609 $\pm$ 0.05	2 <sup>-</sup>		$\gamma$	11, 14, 19
6.01777 $\pm$ 0.03	2 <sup>-</sup>		$\gamma$	11, 14
6.04498 $\pm$ 0.08	0, 1, 2		$\gamma$	11, 14, 19
6.090 $\pm$ 7	(0 <sup>-</sup> )		( $\gamma$ )	6

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$E_x$ (MeV $\pm$ keV)	$J^\pi; T$	$\tau$	Decay	Reactions
6.161 $\pm$ 4	(2, 3 <sup>+</sup> )		( $\gamma$ )	6, 19
6.200 $\pm$ 4	(2 <sup>-</sup> , 3, 4 <sup>+</sup> )		( $\gamma$ )	6, 19
6.240 $\pm$ 7			( $\gamma$ )	19
6.299 $\pm$ 4			( $\gamma$ )	6, 19
6.339 $\pm$ 4			( $\gamma$ )	6, 19
6.375 $\pm$ 4			( $\gamma$ )	6, 19
6.416 $\pm$ 4			( $\gamma$ )	6, 19
6.441 $\pm$ 9			( $\gamma$ )	19
6.474 $\pm$ 3			( $\gamma$ )	6, 19
6.519 $\pm$ 3	0 <sup>+</sup> ; $T = 2$		$\gamma$	9, 18
6.588 $\pm$ 5			( $\gamma$ )	19
6.6270 $\pm$ 0.3	2 <sup>-</sup>	0.31 $\pm$ 0.02	$\gamma$ , n	11, 12
6.6426 $\pm$ 0.3	(3, 4)	< 0.08	$\gamma$ , n	11
6.6475 $\pm$ 0.4	1 <sup>-</sup>	1.59 $\pm$ 0.10	$\gamma$ , n	11, 12
6.6934 $\pm$ 0.6	1 <sup>-</sup>	13.8 $\pm$ 0.8	$\gamma$ , n	6, 11, 12
6.7661 $\pm$ 0.9	(2 <sup>-</sup> , 3, 4 <sup>+</sup> )	$\leq$ 0.6	$\gamma$ , n	6, 11, 19
6.825 $\pm$ 5			n	6, 12, 19
6.8567 $\pm$ 1.0	2	10 $\pm$ 2	$\gamma$ , n	11
6.905 $\pm$ 8				19
6.936 $\pm$ 4				6
6.9678 $\pm$ 1.0	1 <sup>-</sup>	5 $\pm$ 1	$\gamma$ , n	6, 11, 12
(7.0670 $\pm$ 1.2)	0 <sup>-</sup>	(2.4 $\pm$ 0.6)	$\gamma$ , n	11, 12
7.08	(1 <sup>+</sup> )	24	n	6, 12
7.166 $\pm$ 2	2 <sup>(+)</sup>	8 $\pm$ 1	$\gamma$ , n	6, 11, 12, 13
7.232 $\pm$ 7				6
7.283 $\pm$ 4				6
7.319 $\pm$ 8	(1)	33	$\gamma$ , n	6, 11, 12
7.37 $\pm$ 20	(1)	19	n	6, 12
7.42 $\pm$ 20	(2 <sup>+</sup> )	10	$\gamma$ , n	6, 11, 12
7.495 $\pm$ 5	(2)	80	$\gamma$ , n	6, 11, 12
7.655 $\pm$ 5	(2 <sup>+</sup> )	65	$\gamma$ , n	6, 11, 12
7.734 $\pm$ 6		140	n	6, 12

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$E_x$ (MeV $\pm$ keV)	$J^\pi; T$	$\tau$	Decay	Reactions
7.843 $\pm$ 11	1 <sup>-</sup>	(50 $\pm$ 10)	$\gamma, n$	6, 11
7.985 $\pm$ 4	1	14 $\pm$ 2	$\gamma, n$	6, 11
8.05 $\pm$ 100	2 <sup>+</sup> ; $T = 2$			18
8.062 $\pm$ 8				6
8.113 $\pm$ 4		195	$\gamma, n$	6, 11, 12
8.147 $\pm$ 6		15	n	6, 12
8.268 $\pm$ 12				6
8.349 $\pm$ 4				6
8.421		27	n	12
8.50		140	n	12
8.72		$\leq 30$	n	6, 12
8.77		76	n	6, 12
8.94		73	n	6, 12
9.01				6
9.2			n	10, 12
9.52		110	n	12
9.65		100	n	12
9.83		33	n	12
9.85		120	n	12
(9.886 $\pm$ 10)			n	12
9.90		$\leq 30$	n	12
(9.929 $\pm$ 10)			n	12
(9.981 $\pm$ 10)			n	12
10.024 $\pm$ 10		150	n, $\alpha$	12, 13
10.10 $\pm$ 50			n, $\alpha$	13
10.228 $\pm$ 10	0 <sup>-</sup> , 1	$\approx 200$	n, $\alpha$	12, 13
10.480 $\pm$ 10		$\approx 10$	n, $\alpha$	12, 13
10.641 $\pm$ 10	1, 2	70	n	12
10.807 $\pm$ 10	0 <sup>-</sup> , 1	$\approx 310$	n, $\alpha$	12, 13
10.99		190	n	12
(11.045 $\pm$ 10)		$\approx 30$	n	12
(11.130 $\pm$ 10)		< 25	n	12

Table 20.2 from (1987AJ02): Energy levels of  $^{20}\text{F}$  <sup>a</sup> (continued)

$E_x$ (MeV $\pm$ keV)	$J^\pi; T$	$\tau$	Decay	Reactions
(11.244 $\pm$ 10)		< 25	n	<a href="#">12</a>
(11.287 $\pm$ 10)			n	<a href="#">12</a>
11.49 $\pm$ 50			n, $\alpha$	<a href="#">13</a>
12.0			n, $\alpha$	<a href="#">13</a>
12.2 $\pm$ 100			n, $\alpha$	<a href="#">13</a>
12.4			n, $\alpha$	<a href="#">13</a>
12.7			n, $\alpha$	<a href="#">10</a> , <a href="#">13</a>
13.2			n, $\alpha$	<a href="#">13</a>
13.7			n, $\alpha$	<a href="#">12</a> , <a href="#">13</a>
14.0			n, $\alpha$	<a href="#">13</a>

<sup>a</sup> See also Tables [20.3](#), [20.4](#) and [20.5](#).