

Adopted Levels, Gammas

| Type            | Author          | History<br>Citation | Literature Cutoff Date |
|-----------------|-----------------|---------------------|------------------------|
| Full Evaluation | R. B. Firestone | NDS 127, 1 (2015)   | 15-Jan-2015            |

$Q(\beta^-)=5684.2$  18;  $S(n)=8101.5$  18;  $S(p)=11132.7$  20;  $Q(\alpha)=-10344$  15    [2012Wa38](#)

Populated by  $^{22}\text{O}$   $\beta$ -n decay and  $^{23}\text{O}$   $\beta$ -2n decay. No level data measured.

 $^{21}\text{F}$  LevelsCross Reference (XREF) Flags

|          |                                                             |          |                                           |
|----------|-------------------------------------------------------------|----------|-------------------------------------------|
| <b>A</b> | $^{19}\text{F}(t,p),(t,p\gamma)$                            | <b>D</b> | $^{21}\text{O}$ $\beta^-$ decay           |
| <b>B</b> | $^{22}\text{Ne}(t,\alpha)$                                  | <b>E</b> | $^{19}\text{F}(\alpha,^2\text{He})$       |
| <b>C</b> | $^{22}\text{Ne}(d,^3\text{He}),(\text{pol } d,^3\text{He})$ | <b>F</b> | $^{208}\text{Pb}(^{22}\text{Ne},X\gamma)$ |

| E(level)   | $J^\pi$             | $T_{1/2}$  | XREF   | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------|---------------------|------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.0        | $5/2^+$             | 4.158 s 20 | ABCDEF | $\% \beta^- = 100$<br>$\mu = 3.93$ 5; $Q = 0.11$ 2<br>$\mu, Q$ : From <a href="#">2011StZZ</a> .<br>$T_{1/2}$ : From <a href="#">1981Wa06</a> , others: 4.27 s 5 ( <a href="#">1963Bu04</a> ), 4.34 s 4 ( <a href="#">1965Fo05</a> ).<br>$J^\pi$ : L=2 in (d, $\tau$ ).<br>$J^\pi$ : L=0 in (d, $\tau$ ).<br>$J^\pi$ : L=1 in (d, $\tau$ ).<br>$J^\pi$ : L=2 in (d, $\tau$ ).<br>$T_{1/2}$ : From $^7\text{Li}(^{18}\text{O},\alpha\gamma)$ ( <a href="#">1983Ko01</a> ).<br>$J^\pi$ : From $^{19}\text{F}(\alpha,^2\text{He})$ L=4.<br>$J^\pi$ : L=1 in (d, $\tau$ ). |
| 279.93 6   | $1/2^+$             | 6.1 ns 6   | ABCDEF |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1100.9 20  | $1/2^-$             | 0.30 fs 6  | ABC    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1730.40 6  | $3/2^+$             | 0.05 ps 4  | ABCDE  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1754.83 8  | $(7/2^+, 9/2^+)$    | 2.4 ps 3   | A DE   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2039.8 12  | $3/2^-$             | <35 fs     | A C    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2071 2     |                     | 55 fs 21   | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2410 30    | $(1/2, 3/2)^-$      |            | C      | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3459.64 9  | $(3/2, 5/2)^+$      | <0.7 ps    | ABCD   | $J^\pi$ : L=2 in (d, $^3\text{He}$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3517.67 7  | $(3/2, 5/2)^+$      | <0.7 ps    | ABCD   | $J^\pi$ : L=2 in (d, $^3\text{He}$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3638.95 12 | $(3/2^+, 5/2^+)$    |            | AB DE  | $J^\pi$ : From $^{19}\text{F}(\alpha,^2\text{He})$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3966 5     |                     |            | AB     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3996 5     |                     |            | AB     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4064 5     |                     |            | AB     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4172 5     | $(3/2, 5/2)^+$      |            | ABC    | $J^\pi$ : L=2 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4451 5     |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4572.38 25 | $(3/2, 5/2, 7/2)^+$ |            | CD     | $J^\pi$ : L=2 in (d, $\tau$ ) to 4572+4584, log $ft=4.60$ from (5/2 $^+$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4584.0 3   | $(3/2, 5/2)^+$      |            | A CD   | $J^\pi$ : L=2 in (t,p).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4669 5     |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4924 5     |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5029 5     | $3/2^-$             |            | A C    | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5079 5     | $(3/2, 5/2)^+$      |            | A      | $J^\pi$ : L=2 in (t,p).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5350 20    |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5486 20    |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5566? 20   |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5592 20    | $(3/2, 5/2)^+$      |            | A E    | $J^\pi$ : L=2 in (t,p), $^{19}\text{F}(\alpha,^2\text{He})$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5787 20    |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5881 20    |                     |            | A      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 6590       | $(3/2^+, 5/2^+)$    |            | E      | $J^\pi$ : From $^{19}\text{F}(\alpha,^2\text{He})$ , L=2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 7190 20    | $(1/2, 3/2)^-$      |            | C      | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 7470 20    | $3/2^-$             |            | C      | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 7740 20    | $(1/2, 3/2)^-$      |            | C      | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 8090       | $(3/2^+, 5/2^+)$    |            | E      | $J^\pi$ : From $^{19}\text{F}(\alpha,^2\text{He})$ , L=2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 8170 20    | $(1/2, 3/2)^-$      |            | C      | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 8560? 20   | $(1/2, 3/2)^-$      |            | C      | $J^\pi$ : L=1 in (d, $\tau$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ${}^{21}\text{F}$  Levels (continued)

| E(level) | $J^\pi$          | XREF     | Comments                                                          |
|----------|------------------|----------|-------------------------------------------------------------------|
| 8820     | $(3/2^+, 5/2^+)$ | <b>E</b> | $J^\pi$ : From ${}^{19}\text{F}(\alpha, {}^2\text{He})$ , $L=2$ . |
| 9430? 20 | $(1/2, 3/2)^-$   | <b>C</b> | $J^\pi$ : $L=1$ in $(d, \tau)$ .                                  |

 $\gamma({}^{21}\text{F})$ 

| $E_i(\text{level})$ | $J_i^\pi$           | $E_\gamma$ | $I_\gamma$ | $E_f$   | $J_f^\pi$        | Mult. | Comments               |
|---------------------|---------------------|------------|------------|---------|------------------|-------|------------------------|
| 279.93              | $1/2^+$             | 279.92 6   | 100        | 0.0     | $5/2^+$          | (E2)  | $B(E2)(W.u.)=15.7$ 16  |
| 1100.9              | $1/2^-$             | 821 2      | 100        | 279.93  | $1/2^+$          | [E1]  | $B(E1)(W.u.)=5.4$ 11   |
| 1730.40             | $3/2^+$             | 1450.5 2   | 22.0 25    | 279.93  | $1/2^+$          | [M1]  | $B(M1)(W.u.)=0.026$ 21 |
|                     |                     | 1730.28 8  | 100.0 25   | 0.0     | $5/2^+$          | [M1]  | $B(M1)(W.u.)=0.07$ 6   |
| 1754.83             | $(7/2^+, 9/2^+)$    | 1754.74 8  | 100        | 0.0     | $5/2^+$          |       |                        |
| 2039.8              | $3/2^-$             | 1759.0 15  | 32 8       | 279.93  | $1/2^+$          | [E1]  | $B(E1)(W.u.)>0.0011$   |
|                     |                     | 2041.1 20  | 100 8      | 0.0     | $5/2^+$          | [E1]  | $B(E1)(W.u.)>0.0023$   |
| 2071                |                     | 2070.9 20  | 100        | 0.0     | $5/2^+$          |       |                        |
| 3459.64             | $(3/2, 5/2)^+$      | 1729.2 10  | 77 5       | 1730.40 | $3/2^+$          |       |                        |
|                     |                     | 3179.43 10 | 100 6      | 279.93  | $1/2^+$          |       |                        |
|                     |                     | 3459.38 13 | 56 5       | 0.0     | $5/2^+$          |       |                        |
| 3517.67             | $(3/2, 5/2)^+$      | 1787.16 8  | 92 4       | 1730.40 | $3/2^+$          | [M1]  | $B(M1)(W.u.)>0.0026$   |
|                     |                     | 3517.40 10 | 100 4      | 0.0     | $5/2^+$          | [M1]  | $B(M1)(W.u.)>0.00038$  |
| 3638.95             | $(3/2^+, 5/2^+)$    | 1884.01 9  | 100        | 1754.83 | $(7/2^+, 9/2^+)$ |       |                        |
| 3966                |                     | 2236 5     | 100        | 1730.40 | $3/2^+$          |       |                        |
| 4572.38             | $(3/2, 5/2, 7/2)^+$ | 933.2 3    | 100 4      | 3638.95 | $(3/2^+, 5/2^+)$ |       |                        |
|                     |                     | 4572.2 4   | 82 4       | 0.0     | $5/2^+$          |       |                        |
| 4584.0              | $(3/2, 5/2)^+$      | 4583.5 3   | 100        | 0.0     | $5/2^+$          |       |                        |

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

