Table 20.22 from (1983AJ01): States of $^{20}$Ne from $^{16}$O($^6$Li, d), $^{16}$O($^7$Li, t) and $^{16}$O($^{12}$C, $^8$Be) $^a$

<table>
<thead>
<tr>
<th>$E_x$ (MeV ± keV)</th>
<th>$\Gamma_{c.m.}$ (keV)</th>
<th>$\Gamma_{\alpha\alpha}/\Gamma$ $^b$</th>
<th>$S$ $^c$</th>
<th>$J^\pi$</th>
<th>$K^\pi$ $^{a,b,c}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>($^6$Li, d)</td>
<td>($^7$Li, t)</td>
<td>($^{12}$C, $^8$Be) $^b$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>1.00</td>
<td>$0^+$</td>
</tr>
<tr>
<td>1</td>
<td>1.63</td>
<td>1.63</td>
<td></td>
<td>0.41</td>
<td>$2^+$</td>
</tr>
<tr>
<td>2</td>
<td>4.25</td>
<td>4.25</td>
<td></td>
<td>0.22</td>
<td>$4^+$</td>
</tr>
<tr>
<td>3</td>
<td>4.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5.62</td>
<td></td>
<td></td>
<td>0.06</td>
<td>$3^-$</td>
</tr>
<tr>
<td>5</td>
<td>5.78</td>
<td>5.78</td>
<td></td>
<td>0.54</td>
<td>$1^-$</td>
</tr>
<tr>
<td>6</td>
<td>6.72</td>
<td></td>
<td></td>
<td>0.56</td>
<td>$0^+$</td>
</tr>
<tr>
<td>7</td>
<td>7.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>7.16</td>
<td>7.16</td>
<td>7.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>7.42</td>
<td></td>
<td></td>
<td>0.13</td>
<td>$2^+$</td>
</tr>
<tr>
<td>10</td>
<td>8.45</td>
<td></td>
<td></td>
<td>0.04</td>
<td>$5^-$</td>
</tr>
<tr>
<td>11</td>
<td>8.78</td>
<td>8.78</td>
<td>8.78</td>
<td></td>
<td>$6^+$</td>
</tr>
<tr>
<td>12</td>
<td>10.3 ± 100</td>
<td>10.26</td>
<td>10.26</td>
<td>145 ± 40</td>
<td>$0^-$</td>
</tr>
<tr>
<td>13</td>
<td>10.7 ± 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>11.95</td>
<td>11.95</td>
<td>11.95</td>
<td>$0.85 \pm 0.15$</td>
<td>$8^+$</td>
</tr>
<tr>
<td>15</td>
<td>12.15</td>
<td></td>
<td></td>
<td>$0.05$</td>
<td>$6^+$</td>
</tr>
<tr>
<td>16</td>
<td>12.6 ± 100</td>
<td>12.591 ± 10</td>
<td>12.59</td>
<td>$110 \pm 40$</td>
<td>$0.80 \pm 0.10$</td>
</tr>
<tr>
<td>17</td>
<td>13.9</td>
<td>13.904 ± 20</td>
<td></td>
<td>$\approx 100$</td>
<td>$6^+$</td>
</tr>
<tr>
<td>18</td>
<td>14.3</td>
<td>14.310 ± 20</td>
<td></td>
<td>$&lt; 100$</td>
<td>$6^+$</td>
</tr>
<tr>
<td>19</td>
<td>15.35 ± 100</td>
<td>15.336 ± 15</td>
<td>15.34</td>
<td>380 ± 60</td>
<td>$0.90 \pm 0.10$</td>
</tr>
<tr>
<td>20</td>
<td>15.9 ± 100</td>
<td></td>
<td></td>
<td>$&lt; 250$</td>
<td>$7^-$</td>
</tr>
</tbody>
</table>

$^a$ Indicates the states of $^{20}$Ne from $^{16}$O($^6$Li, d), $^{16}$O($^7$Li, t) and $^{16}$O($^{12}$C, $^8$Be) transitions.

$^b$ The uncertainties are shown for the $^{12}$C, $^8$Be reactions.

$^c$ Lower limits are indicated for $\Gamma_{\alpha\alpha}/\Gamma$.
Table 20.22 from (1983AJ01): States of $^{20}$Ne from $^{16}$O($^6$Li, d), $^{16}$O($^7$Li, t) and $^{16}$O($^{12}$C, $^8$Be) \(^a\) (continued)

<table>
<thead>
<tr>
<th>(E_x) (MeV ± keV)</th>
<th>(\Gamma_{c.m.}) (keV)</th>
<th>(\Gamma_{\alpha})/(\Gamma) (^b)</th>
<th>(S) (^c)</th>
<th>(J^\pi)</th>
<th>(K^\pi) (^a,b,c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>((^6\text{Li, d)})</td>
<td>((^7\text{Li, t)})</td>
<td>((^{12}\text{C, }^8\text{Be)})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>16.7 ± 100</td>
<td>16.63 ± 20</td>
<td>16.63</td>
<td>190 ± 40</td>
<td>0.90 ± 0.10</td>
</tr>
<tr>
<td>22</td>
<td>17.35 ± 100</td>
<td>17.30 ± 20</td>
<td>17.30</td>
<td>220 ± 40</td>
<td>≥ 0.40 ± 0.10</td>
</tr>
<tr>
<td>23</td>
<td>18.7 ± 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>19.4 ± 100</td>
<td></td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>19.9 ± 100</td>
<td></td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>20.67 ± 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>20.8 ± 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>21.08 ± 30</td>
<td>21.08</td>
<td>100 ± 50</td>
<td>0.65 ± 0.15</td>
</tr>
<tr>
<td>29</td>
<td>21.3 ± 100</td>
<td></td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>21.8 ± 100</td>
<td></td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>22.3 ± 100</td>
<td></td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>22.87 ± 40</td>
<td>22.87</td>
<td>225 ± 40</td>
<td>0.90 ± 0.10</td>
</tr>
<tr>
<td>33</td>
<td>23.5 ± 100</td>
<td>23.70 ± 30</td>
<td></td>
<td>≤ 200</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>24.21 ± 25</td>
<td></td>
<td>≈ 500</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>25.10 ± 50</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>36</td>
<td></td>
<td>25.67 ± 50 (^f)</td>
<td></td>
<td>≈ 500</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>27.1 ± 100 (^d)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>38</td>
<td>28.1 ± 100 (^d)</td>
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<td></td>
</tr>
<tr>
<td>39</td>
<td>(29.4) (^d)</td>
<td></td>
<td>(33.4) (^d)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
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<td></td>
</tr>
</tbody>
</table>
For complete references see Table 20.24 in (1978AJ03).

(1979SA29): $E(^{12}\text{C}) = 78$ MeV.

Relative $\alpha$-particle spectroscopic factors (1979AN01): $E(^6\text{Li}) = 32$ MeV (DWBA). $S_\alpha$ values are reported by (1981TA06, 1981TA23: $E(^6\text{Li}) = 75.4$ MeV). See also Table 20.24 in (1978AJ03), (1978BE43) and (1979BR03).

(1977AR18): $E(^6\text{Li}) = 57.8$ MeV.

(1979FO20) suggest an admixture of $6^+$ or $8^+$ in the d-$\alpha$ angular correlation involving $^{20}\text{Ne}^*(16.6)$ and a doublet ($8^+ + 7^-)$ at $E_x = 17.4$ MeV.