

⁹⁰Zr(e,e') 1975Si21,1980Me13,1984He02

| Type | Author | Citation | Literature Cutoff Date |
|-----------------|-----------------------------|------------------|------------------------|
| Full Evaluation | S. K. Basu, E. A. Mccutchan | NDS 165,1 (2020) | 1-Mar-2020 |

1975Si21: E=53.75-112.2 MeV. Measured $\sigma(E,\theta)$, momentum transfer=0.29-1.07 fm⁻¹, FWHM≈0.15%, enriched target. DWBA analysis.

1980Me13: E=24-66 MeV. Measured $\sigma(E,\theta)$, momentum transfer=0.20-0.62 fm⁻¹, FWHM≈30 keV, enriched target. DWBA analysis.

1984He02: E=70-368 MeV. Measured $\sigma(E,\theta)$, momentum transfer=0.4-3.1 fm⁻¹, FWHM<40 keV, enriched target. DWBA analysis.

Others: [1983Sc01](#), [1982Sc08](#), [1982Fa11](#), [1974Si01](#), [1973Ph02](#), [1991Ta23](#), [1970Be07](#).

The radius of the g(9/2) proton orbit was determined from the density of the 3589, 8⁺ level as R=5.04 fm 5 ([1984He02](#)).

Configuration assignments are from [1984He02](#).

For summed M1 and M2 strength in the region 8-10 MeV, see [1980Me13](#).

For deformation parameters, see [1975Si21](#).

⁹⁰Zr Levels

| E(level) [†] | J ^π # | Comments |
|-----------------------|-----------------------------------|--|
| 0 | | |
| 2180 13 | 2 ⁺ | B(E2) [†] =0.0653 21 (1984He02); Configuration=(π 1g _{9/2}) ⁺² B(E2) [†] : Other: 0.067 6 (1975Si21). |
| 2310 11 | 5 ⁻ | |
| 2738 15 | 3 ⁻ | B(E3) [†] =0.087 10 (1975Si21) |
| 3060 15 | 4 ⁺ | Configuration=(π 1g _{9/2}) ⁺² B(E4) [†] : Other: 0.0030 9 (1975Si21). |
| 3290 25 | 2 ⁺ | B(E2) [†] =0.0078 8 (1984He02); Configuration=(π 1g _{9/2} 0 ⁺)(CORE 2 ⁺) |
| 3456 [‡] | 6 ⁺ | Configuration=(π 1g _{9/2}) ⁺² |
| 3589 [‡] | 8 ⁺ | Configuration=(π 1g _{9/2}) ⁺² |
| 3835 14 | 2 ⁺ | B(E2) [†] =0.0224 13 (1984He02); Configuration=(π 1g _{9/2} 2 ⁺)(CORE 2 ⁺) |
| 3955 23 | 5 ⁻ | |
| 4067 22 | (4 ⁺) | Configuration=(π 1g _{9/2} 2 ⁺)(CORE 2 ⁺) |
| 4223 [‡] 2 | (2 ⁺) | |
| 4228 [‡] 2 | (4 ⁻) | |
| 4231 [‡] 2 | (6 ⁻) | |
| 4334 [‡] 2 | 4 ⁺ | Configuration=((ν 2d _{5/2})(ν 1g _{9/2}) ⁻¹) |
| 4460 [‡] | (5 ⁺) | Configuration=((ν d _{5/2})(ν 1g _{9/2}) ⁻¹) |
| 4471 12 | 4 ⁺ | |
| 4542 [‡] | 6 ⁻ | Configuration=((π 1g _{9/2})(π 2p _{3/2}) ⁻¹) |
| 4548 [‡] 4 | 6 ⁺ | Configuration=((ν 2d _{5/2})(ν 1g _{9/2}) ⁻¹) |
| 4690 [‡] | 2 ⁺ | Configuration=(π 1g _{9/2} 0 ⁺)(CORE 2 ⁺) |
| 5061 [‡] | 7 ⁺ | Configuration=((ν 2d _{5/2})(ν 1g _{9/2}) ⁻¹) |
| 5070 [‡] | (2 ⁺) | Configuration=(π 1g _{9/2} 0 ⁺)(CORE 2 ⁺) |
| 5620 20 | 3 ⁻ | B(E3) [†] =0.0068 10 (1975Si21) |
| 5770 32 | 3 ⁻ | B(E3) [†] =0.00145 22 (1975Si21) |
| 7774 10 | (1 ⁺ ,2 ⁻) | |
| 7806 10 | (2 ⁻) | |
| 7868 10 | (1 ⁺ ,2 ⁻) | |
| 7907 10 | | |
| 7996 10 | (3 ⁻) | |
| 8032 10 | 2 ⁻ | |
| 8113 10 | 1 ⁻ ,(2 ⁻) | |
| 8142 10 | 1 ⁺ ,(2 ⁻) | |
| 8233 10 | 1 ⁺ | |

Continued on next page (footnotes at end of table)

${}^{90}\text{Zr}(e,e')$ [1975Si21](#), [1980Me13](#), [1984He02](#) (continued) ${}^{90}\text{Zr}$ Levels (continued)

| <u>E(level)[†]</u> | <u>J^π#</u> | <u>E(level)[†]</u> | <u>J^π#</u> | <u>E(level)[†]</u> | <u>J^π#</u> | <u>E(level)[†]</u> | <u>J^π#</u> |
|-----------------------------|-----------------------------------|-----------------------------|-----------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| 8291 <i>10</i> | 2 ⁻ | 8627 <i>10</i> | 2 ⁻ | 9000 <i>10</i> | 1 ⁺ | 9371 <i>10</i> | 1 ⁺ |
| 8316 <i>10</i> | (2 ⁻) | 8701 <i>10</i> | (2 ⁻) | 9061 <i>10</i> | 2 ⁻ | 9439 <i>10</i> | 1 ⁺ ,(2 ⁻) |
| 8366 <i>10</i> | (1 ⁺) | 8809 <i>10</i> | (2 ⁻) | 9101 <i>10</i> | 2 ⁻ | 9489 <i>10</i> | 2 ⁻ |
| 8400 <i>10</i> | (2 ⁻) | 8853 <i>10</i> | 2 ⁻ | 9127 <i>10</i> | 2 ⁻ | 9520 <i>10</i> | (1 ⁺ ,2 ⁻) |
| 8442 <i>10</i> | 2 ⁻ | 8882 <i>10</i> | 2 ⁻ | 9150 <i>10</i> | 1 ⁻ ,(2 ⁻) | 9541 <i>10</i> | 2 ⁻ |
| 8494 <i>10</i> | 1 ⁻ ,(2 ⁻) | 8911 <i>10</i> | 2 ⁻ | 9265 <i>10</i> | 2 ⁻ | 9601 <i>10</i> | (1 ⁻ ,2 ⁻) |
| 8542 <i>10</i> | 2 ⁻ | 8934 <i>10</i> | 2 ⁻ | 9294 <i>10</i> | 2 ⁻ | 9694 <i>10</i> | 2 ⁻ |
| 8602 <i>10</i> | (1 ⁺) | 8971 <i>10</i> | 2 ⁻ | 9327 <i>10</i> | 2 ⁻ | 9863 <i>10</i> | (1 ⁻ ,2 ⁻) |

[†] Data are from [1975Si21](#) for levels up to 6 MeV and from [1980Me13](#) for levels above 6 MeV, except where noted. ΔE as stated by [1980Me13](#), is 3-10 keV for levels above 6 MeV.

[‡] From [1984He02](#).

[#] As given by the authors, derived from a combination of literature and DWBA analysis by [1975Si21](#), [1984He02](#), and from DWBA analysis by [1980Me13](#).