

${}^{90}\text{Zr}(p,n\gamma)$ 1972Yo03

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

1972Yo03: E(p)=6.90-9.50 MeV. Measured excit with Ge(Li) at 90°.

 ${}^{90}\text{Nb}$ Levels

| E(level) [†] | J ^π [‡] | E(level) [†] | J ^π [‡] | E(level) [†] | J ^π [‡] | E(level) [†] | J ^π [‡] |
|-----------------------|-----------------------------|-----------------------|-----------------------------|-----------------------|-----------------------------|-----------------------|-----------------------------|
| 0.0 | 8 ⁺ | 822.6 | | 1372.0 12 | (2 ⁻) | ≈1907? | |
| 122.4 | 6 ⁺ | 827.5 | (2) ⁺ | 1414 1 | | 1972 1 | |
| 124.8 5 | 4 ⁻ | 847.8 7 | | 1433 1 | | 1991 1 | |
| 171.2 3 | 7 ⁺ | 854.3 | 2 ⁺ | 1631 1 | | ≈2007? | |
| 285.3 | 5 ⁺ | 1128.3 3 | | 1647 1 | | 2125.6 | (1) ⁺ |
| 328.0 3 | 4 ⁺ | 1196 1 | | 1769.0 | (1) ⁺ | ≈2160? | |
| 362.4 6 | 5 ⁻ | 1280 1 | | 1816 1 | | | |
| 382.1 | 1 ⁺ | 1344.1 | (1) ⁺ | 1836 1 | | | |
| 651.2 | 3 ⁺ | 1363 1 | | 1844.5 | (1) ⁺ | | |

[†] From 1972Yo03.

[‡] As proposed by 1972Yo03.

 $\gamma({}^{90}\text{Nb})$

For measured ce spectrum, see 1972Pi13.

| E_γ | $E_i(\text{level})$ | J_i^π | E_f | J_f^π | Comments |
|------------------------|---------------------|-------------------|-------|------------------|--|
| (2.4) | 124.8 | 4 ⁻ | 122.4 | 6 ⁺ | |
| 42.7 3 | 328.0 | 4 ⁺ | 285.3 | 5 ⁺ | |
| 122.37 [†] 22 | 122.4 | 6 ⁺ | 0.0 | 8 ⁺ | |
| 162.93 [†] 9 | 285.3 | 5 ⁺ | 122.4 | 6 ⁺ | |
| 171.2 3 | 171.2 | 7 ⁺ | 0.0 | 8 ⁺ | |
| 203.13 [†] 10 | 854.3 | 2 ⁺ | 651.2 | 3 ⁺ | |
| 237.6 3 | 362.4 | 5 ⁻ | 124.8 | 4 ⁻ | |
| 257.34 [†] 4 | 382.1 | 1 ⁺ | 124.8 | 4 ⁻ | |
| 323.20 [†] 18 | 651.2 | 3 ⁺ | 328.0 | 4 ⁺ | |
| 440.5 [†] 6 | 822.6 | | 382.1 | 1 ⁺ | |
| 445.37 [†] 21 | 827.5 | (2) ⁺ | 382.1 | 1 ⁺ | |
| 472.2 [†] 3 | 854.3 | 2 ⁺ | 382.1 | 1 ⁺ | |
| 477.1 3 | 1128.3 | | 651.2 | 3 ⁺ | |
| 485.4 3 | 847.8 | | 362.4 | 5 ⁻ | |
| 489.8 [†] 4 | 1344.1 | (1) ⁺ | 854.3 | 2 ⁺ | |
| 517.7 [†] 7 | 1372.0 | (2 ⁻) | 854.3 | 2 ⁺ | |
| 641 1 | 1836 | | 1196 | | |
| 711 1 | 1363 | | 651.2 | 3 ⁺ | |
| 722 1 | 847.8 | | 124.8 | 4 ⁻ | |
| 763 1 | 1414 | | 651.2 | 3 ⁺ | |
| 941.5 [†] 4 | 1769.0 | (1) ⁺ | 827.5 | (2) ⁺ | |
| 946.4 [†] 8 | 1769.0 | (1) ⁺ | 822.6 | | |
| 981 1 | 1363 | | 382.1 | 1 ⁺ | E _γ : Authors' value of 891 in their Table I is a misprint. |

Continued on next page (footnotes at end of table)

${}^{90}\text{Zr}(\text{p},\text{n}\gamma)$ **1972Yo03 (continued)** $\gamma({}^{90}\text{Nb})$ (continued)

| E_γ | $E_i(\text{level})$ | J_i^π | E_f | J_f^π | E_γ | $E_i(\text{level})$ | J_i^π | E_f | J_f^π |
|----------------------------|---------------------|------------------|-------|----------------|----------------------------|---------------------|------------------|-------|----------------|
| 990.2 [†] 6 | 1844.5 | (1) ⁺ | 854.3 | 2 ⁺ | 1309 <i>I</i> | 1433 | | 124.8 | 4 ⁻ |
| 1003 <i>I</i> | 1128.3 | | 124.8 | 4 ⁻ | 1340 <i>I</i> | 1991 | | 651.2 | 3 ⁺ |
| 1035 <i>I</i> | 1363 | | 328.0 | 4 ⁺ | 1387.4 [†] 5 | 1769.0 | (1) ⁺ | 382.1 | 1 ⁺ |
| 1053 [‡] <i>I</i> | ≈1907? | | 854.3 | 2 ⁺ | 1463.5 [†] 9 | 1844.5 | (1) ⁺ | 382.1 | 1 ⁺ |
| 1071 <i>I</i> | 1196 | | 124.8 | 4 ⁻ | 1506 <i>I</i> | 1631 | | 124.8 | 4 ⁻ |
| 1105 <i>I</i> | 1433 | | 328.0 | 4 ⁺ | 1522 <i>I</i> | 1647 | | 124.8 | 4 ⁻ |
| 1155 <i>I</i> | 1280 | | 124.8 | 4 ⁻ | 1625 [‡] <i>I</i> | ≈2007? | | 382.1 | 1 ⁺ |
| 1184 <i>I</i> | 1836 | | 651.2 | 3 ⁺ | 1691 <i>I</i> | 1816 | | 124.8 | 4 ⁻ |
| 1238 <i>I</i> | 1363 | | 124.8 | 4 ⁻ | 1778 [‡] <i>I</i> | ≈2160? | | 382.1 | 1 ⁺ |
| 1248 <i>I</i> | 1372.0 | (2) ⁻ | 124.8 | 4 ⁻ | 1847 <i>I</i> | 1972 | | 124.8 | 4 ⁻ |
| 1271.3 [†] 6 | 2125.6 | (1) ⁺ | 854.3 | 2 ⁺ | 1865 <i>I</i> | 1991 | | 124.8 | 4 ⁻ |

[†] From ${}^{90}\text{Mo}$ ε decay. Values are mostly from [1966Pe10](#), as quoted by [1968Co05](#).

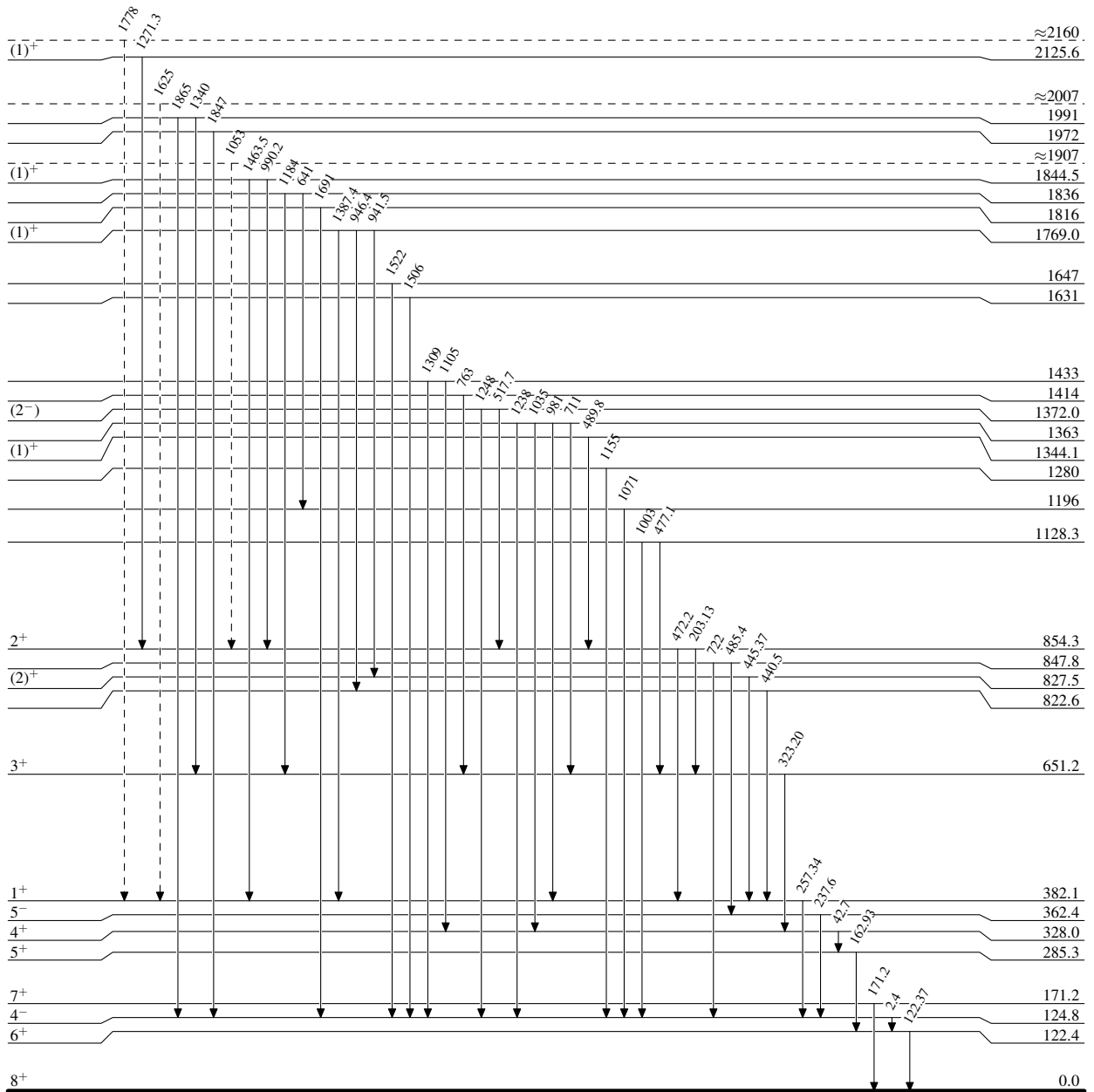
[‡] Placement of transition in the level scheme is uncertain.

$^{90}\text{Zr}(p,\gamma)$ 1972Yo03

Legend

Level Scheme

-----► γ Decay (Uncertain)



$^{90}_{41}\text{Nb}_{49}$