

$^{68}\text{Zn}(^{19}\text{F},\text{p}3\text{n}\gamma)$ **1990DoZX,1990DoZT**

| Type | Author | History Citation | Literature Cutoff Date |
|-----------------|-----------------|---------------------|------------------------|
| Full Evaluation | E. A. Mccutchan | NDS 125, 201 (2015) | 31-Dec-2014 |

$E(^{19}\text{F})=72$ MeV. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$, γ -particle coincidences using the NORDBALL array consisting of 18 Compton-suppressed HPGe detectors, 10 BaF₂ detectors, and the HYSTRIX system for charged particles. [1990DoZX](#) and [1990DoZT](#) report results from the same experiment; [1990DoZX](#) provides only information on the positive parity levels whereas [1990DoZT](#) focuses on the negative parity excitations.

^{83}Sr Levels

| E(level) [†] | J ^π [‡] | Comments |
|-----------------------|-----------------------------|--|
| 0 | 7/2 ⁺ | |
| 35.47 [#] 6 | 9/2 ⁺ | |
| 259.0 | 1/2 ⁻ | |
| 754.1 | (5/2 ⁻) | |
| 800.2 | 11/2 ⁺ | |
| 835.2 | | J ^π : (9/2 ⁻) proposed by 1990DoZT . |
| 894.0 | 11/2 ⁺ | |
| 910.0 | 13/2 ⁺ | |
| 1448.1 | (9/2 ⁻) | |
| 1574.7 | (9/2) ⁺ | J ^π : (13/2 ⁻) proposed by 1990DoZT . |
| 1590.2 | | J ^π : (11/2 ⁻) proposed by 1990DoZT . |
| 1856.5 | 15/2 ⁺ | |
| 1987.0 | 17/2 ⁺ | |
| 2046.1 | (13/2 ⁻) | |
| 2107.2 | (13/2 ⁻) | |
| 2539.5 | (15/2) | J ^π : (15/2 ⁻) proposed by 1990DoZT . |
| 2643.4 | (17/2 ⁻) | |
| 2848.0 | (17/2 ⁻) | |
| 3008.8 | (19/2 ⁺) | |
| 3047.2 | (19/2 ⁻) | |
| 3115.9 | 21/2 ⁺ | |
| 3349.2 | (21/2 ⁺) | |
| 3470.2 | (21/2 ⁻) | |
| 3526.3 | (21/2 ⁻) | |
| 3643.7 | 23/2 ⁺ | |
| 4044.1 | (23/2 ⁻) | |
| 4167.8 | 25/2 ⁺ | |
| 4196.2 | (23/2 ⁻) | |
| 4395.8 | (25/2 ⁺) | |
| 4634.5 | (25/2 ⁻) | |
| 4751.8 | (27/2 ⁺) | |
| 4947.9? | (-) | |
| 5090.7 | (27/2 ⁺) | |
| 5207.8 | (27/2 ⁻) | |
| 5377.7 | 29/2 ⁺ | |
| 5395.2 | (-) | |
| 5611.6 | (29/2 ⁺) | |
| 5854.6 | (29/2 ⁻) | |
| 6204.3 | 31/2 ⁺ | |
| 6428.8 | (31/2 ⁻) | |
| 6751.5 | 33/2 ⁺ | |
| 7101.6? | (+) | J ^π : π=(+) proposed by 1990DoZT,1990DoZX . |
| 7233.6? | (-) | J ^π : π=(-) proposed by 1990DoZT . |
| 7739.8 | (35/2 ⁻) | |

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$^{68}\text{Zn}(^{19}\text{F,p3n}\gamma)$ 1990DoZX,1990DoZT (continued) ^{83}Sr Levels (continued)

| <u>E(level)[†]</u> | <u>J^π[‡]</u> |
|-----------------------------|----------------------------------|
| 8119.5 | 37/2 ⁺ |
| 9278.8 | (39/2 ⁻) |
| 9649.5 | 41/2 ⁺ |
| 11461.6 | 45/2 ⁺ |

[†] From a least-squares fit to E_γ , by the evaluator, except where noted.

[‡] From the Adopted Levels. Differences with the assignments of 1990DoZX and 1990DoZT are indicated in the comments.

From the Adopted Levels.

 $\gamma(^{83}\text{Sr})$

| <u>E_γ</u> | <u>$E_i(\text{level})$</u> | <u>J_i^π</u> | <u>E_f</u> | <u>J_f^π</u> | <u>Comments</u> |
|------------------------------|---------------------------------------|-----------------------------|-------------------------|-----------------------------|--|
| 104 | 2643.4 | (17/2 ⁻) | 2539.5 | (15/2) | |
| 199 | 3047.2 | (19/2 ⁻) | 2848.0 | (17/2 ⁻) | |
| 205 | 2848.0 | (17/2 ⁻) | 2643.4 | (17/2 ⁻) | |
| 233 | 3349.2 | (21/2 ⁺) | 3115.9 | 21/2 ⁺ | E_γ : 223 keV in figure 1 of 1990DoZX is incorrect because it does not fit the level diagram. Evaluator assumes 223 is typographical error. |
| 259 | 259.0 | 1/2 ⁻ | 0 | 7/2 ⁺ | |
| 260 | 5207.8 | (27/2 ⁻) | 4947.9? | (-) | |
| 294 | 3643.7 | 23/2 ⁺ | 3349.2 | (21/2 ⁺) | |
| 308 | 2848.0 | (17/2 ⁻) | 2539.5 | (15/2) | |
| 404 | 3047.2 | (19/2 ⁻) | 2643.4 | (17/2 ⁻) | |
| 423 | 3470.2 | (21/2 ⁻) | 3047.2 | (19/2 ⁻) | |
| 432 | 2539.5 | (15/2) | 2107.2 | (13/2 ⁻) | |
| 479 | 3526.3 | (21/2 ⁻) | 3047.2 | (19/2 ⁻) | |
| 495 | 754.1 | (5/2 ⁻) | 259.0 | 1/2 ⁻ | |
| 517 | 2107.2 | (13/2 ⁻) | 1590.2 | | |
| 521 | 5611.6 | (29/2 ⁺) | 5090.7 | (27/2 ⁺) | |
| 524 | 4167.8 | 25/2 ⁺ | 3643.7 | 23/2 ⁺ | |
| 528 | 3643.7 | 23/2 ⁺ | 3115.9 | 21/2 ⁺ | |
| 536 | 2643.4 | (17/2 ⁻) | 2107.2 | (13/2 ⁻) | |
| 547 | 6751.5 | 33/2 ⁺ | 6204.3 | 31/2 ⁺ | |
| 573 | 5207.8 | (27/2 ⁻) | 4634.5 | (25/2 ⁻) | |
| 574 | 4044.1 | (23/2 ⁻) | 3470.2 | (21/2 ⁻) | |
| 584 | 4751.8 | (27/2 ⁺) | 4167.8 | 25/2 ⁺ | |
| 590 | 4634.5 | (25/2 ⁻) | 4044.1 | (23/2 ⁻) | |
| 593 | 6204.3 | 31/2 ⁺ | 5611.6 | (29/2 ⁺) | |
| 598 | 2643.4 | (17/2 ⁻) | 2046.1 | (13/2 ⁻) | |
| 626 | 5377.7 | 29/2 ⁺ | 4751.8 | (27/2 ⁺) | |
| 647 | 5854.6 | (29/2 ⁻) | 5207.8 | (27/2 ⁻) | |
| 656 | 2643.4 | (17/2 ⁻) | 1987.0 | 17/2 ⁺ | |
| 659 | 2107.2 | (13/2 ⁻) | 1448.1 | (9/2 ⁻) | |
| 670 | 4196.2 | (23/2 ⁻) | 3526.3 | (21/2 ⁻) | |
| 680 | 1574.7 | (9/2 ⁺) | 894.0 | 11/2 ⁺ | |
| 694 | 1448.1 | (9/2 ⁻) | 754.1 | (5/2 ⁻) | |
| 695 | 5090.7 | (27/2 ⁺) | 4395.8 | (25/2 ⁺) | |
| 726 | 4196.2 | (23/2 ⁻) | 3470.2 | (21/2 ⁻) | |
| 752 | 4395.8 | (25/2 ⁺) | 3643.7 | 23/2 ⁺ | |
| 755 | 1590.2 | | 835.2 | | |
| 765 | 800.2 | 11/2 ⁺ | 35.47 | 9/2 ⁺ | |
| 787 | 2643.4 | (17/2 ⁻) | 1856.5 | 15/2 ⁺ | |
| 800 | 800.2 | 11/2 ⁺ | 0 | 7/2 ⁺ | |

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$^{68}\text{Zn}(^{19}\text{F},\text{p}3\text{n}\gamma)$ **1990DoZX,1990DoZT** (continued) $\gamma(^{83}\text{Sr})$ (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 |
|-------------------|---------------------|----------------------|--------|----------------------|-------------------|---------------------|----------------------|--------|----------------------|
| 800 | 835.2 | | 35.47 | 9/2 ⁺ | 1165 [‡] | 4634.5 | (25/2 ⁻) | 3470.2 | (21/2 ⁻) |
| 827 [‡] | 6204.3 | 31/2 ⁺ | 5377.7 | 29/2 ⁺ | 1197 | 2107.2 | (13/2 ⁻) | 910.0 | 13/2 ⁺ |
| 835 | 835.2 | | 0 | 7/2 ⁺ | 1199 | 5395.2 | (-) | 4196.2 | (23/2 ⁻) |
| 858 | 894.0 | 11/2 ⁺ | 35.47 | 9/2 ⁺ | 1210 | 5377.7 | 29/2 ⁺ | 4167.8 | 25/2 ⁺ |
| 860 | 5611.6 | (29/2 ⁺) | 4751.8 | (27/2 ⁺) | 1213 | 2107.2 | (13/2 ⁻) | 894.0 | 11/2 ⁺ |
| 875 | 910.0 | 13/2 ⁺ | 35.47 | 9/2 ⁺ | 1216 [‡] | 5611.6 | (29/2 ⁺) | 4395.8 | (25/2 ⁺) |
| 883 | 3526.3 | (21/2 ⁻) | 2643.4 | (17/2 ⁻) | 1220 | 5854.6 | (29/2 ⁻) | 4634.5 | (25/2 ⁻) |
| 904 | 4947.9? | (-) | 4044.1 | (23/2 ⁻) | 1221 | 6428.8 | (31/2 ⁻) | 5207.8 | (27/2 ⁻) |
| 946 | 1856.5 | 15/2 ⁺ | 910.0 | 13/2 ⁺ | 1246 | 2046.1 | (13/2 ⁻) | 800.2 | 11/2 ⁺ |
| 963 | 1856.5 | 15/2 ⁺ | 894.0 | 11/2 ⁺ | 1280 | 4395.8 | (25/2 ⁺) | 3115.9 | 21/2 ⁺ |
| 964 | 2539.5 | (15/2) | 1574.7 | (9/2 ⁺) | 1311 | 7739.8 | (35/2 ⁻) | 6428.8 | (31/2 ⁻) |
| 1022 | 3008.8 | (19/2 ⁺) | 1987.0 | 17/2 ⁺ | 1351 | 5395.2 | (-) | 4044.1 | (23/2 ⁻) |
| 1052 | 4167.8 | 25/2 ⁺ | 3115.9 | 21/2 ⁺ | 1362 | 3349.2 | (21/2 ⁺) | 1987.0 | 17/2 ⁺ |
| 1077 | 1987.0 | 17/2 ⁺ | 910.0 | 13/2 ⁺ | 1368 | 8119.5 | 37/2 ⁺ | 6751.5 | 33/2 ⁺ |
| 1108 [†] | 4634.5 | (25/2 ⁻) | 3526.3 | (21/2 ⁻) | 1374 | 6751.5 | 33/2 ⁺ | 5377.7 | 29/2 ⁺ |
| 1108 [†] | 4751.8 | (27/2 ⁺) | 3643.7 | 23/2 ⁺ | 1379 [‡] | 7233.6? | (-) | 5854.6 | (29/2 ⁻) |
| 1114 [‡] | 6204.3 | 31/2 ⁺ | 5090.7 | (27/2 ⁺) | 1452 | 6204.3 | 31/2 ⁺ | 4751.8 | (27/2 ⁺) |
| 1129 | 3115.9 | 21/2 ⁺ | 1987.0 | 17/2 ⁺ | 1490 [‡] | 7101.6? | (+) | 5611.6 | (29/2 ⁺) |
| 1137 | 2046.1 | (13/2 ⁻) | 910.0 | 13/2 ⁺ | 1530 | 9649.5 | 41/2 ⁺ | 8119.5 | 37/2 ⁺ |
| 1149 | 4196.2 | (23/2 ⁻) | 3047.2 | (19/2 ⁻) | 1539 | 9278.8 | (39/2 ⁻) | 7739.8 | (35/2 ⁻) |
| 1152 [†] | 2046.1 | (13/2 ⁻) | 894.0 | 11/2 ⁺ | 1630 | 2539.5 | (15/2) | 910.0 | 13/2 ⁺ |
| 1152 [†] | 3008.8 | (19/2 ⁺) | 1856.5 | 15/2 ⁺ | 1812 | 11461.6 | 45/2 ⁺ | 9649.5 | 41/2 ⁺ |
| 1164 | 5207.8 | (27/2 ⁻) | 4044.1 | (23/2 ⁻) | | | | | |

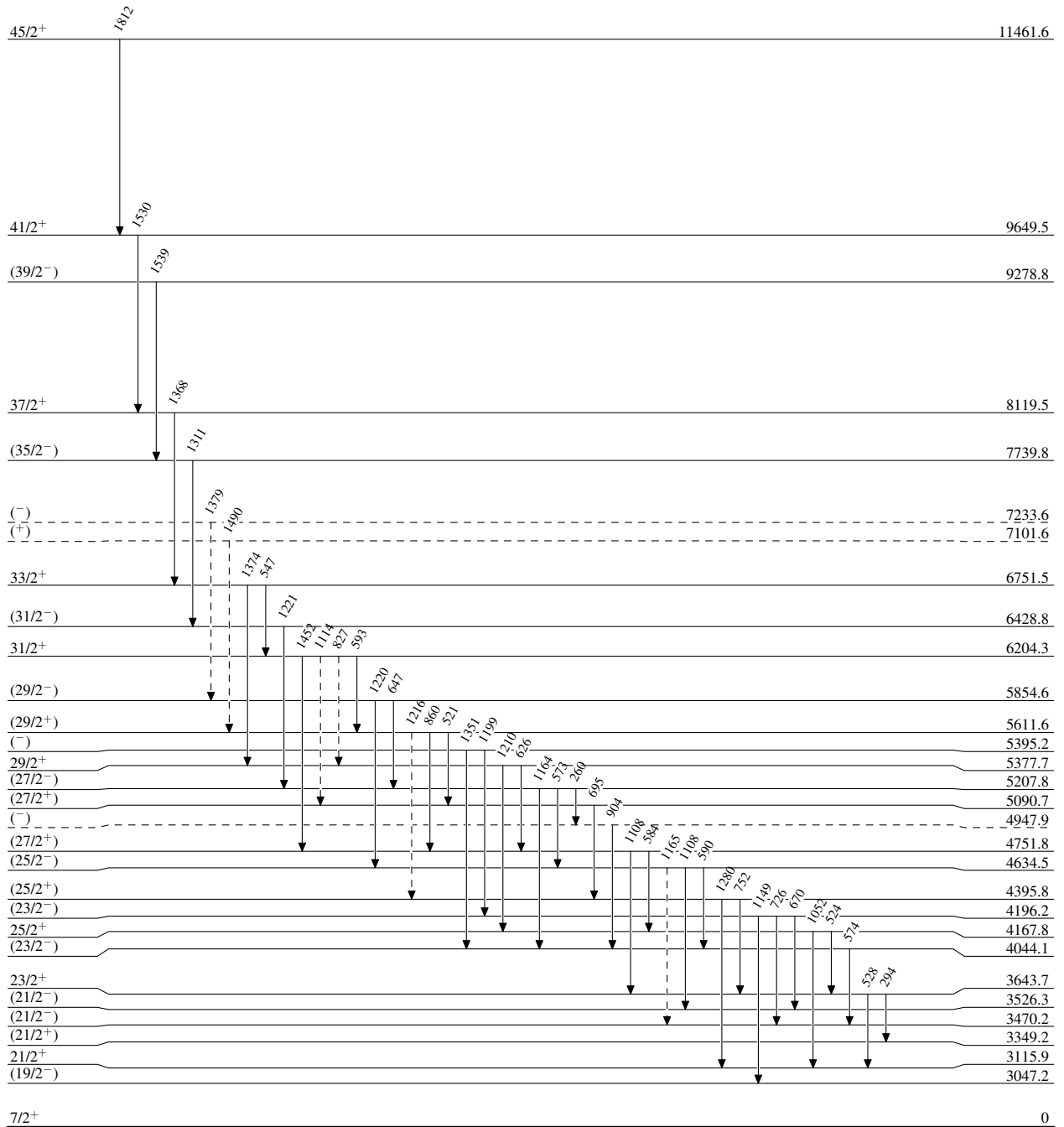
[†] Multiply placed.

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

$^{68}\text{Zn}(^{19}\text{F},\text{p}3\text{n}\gamma)$ 1990DoZX,1990DoZT

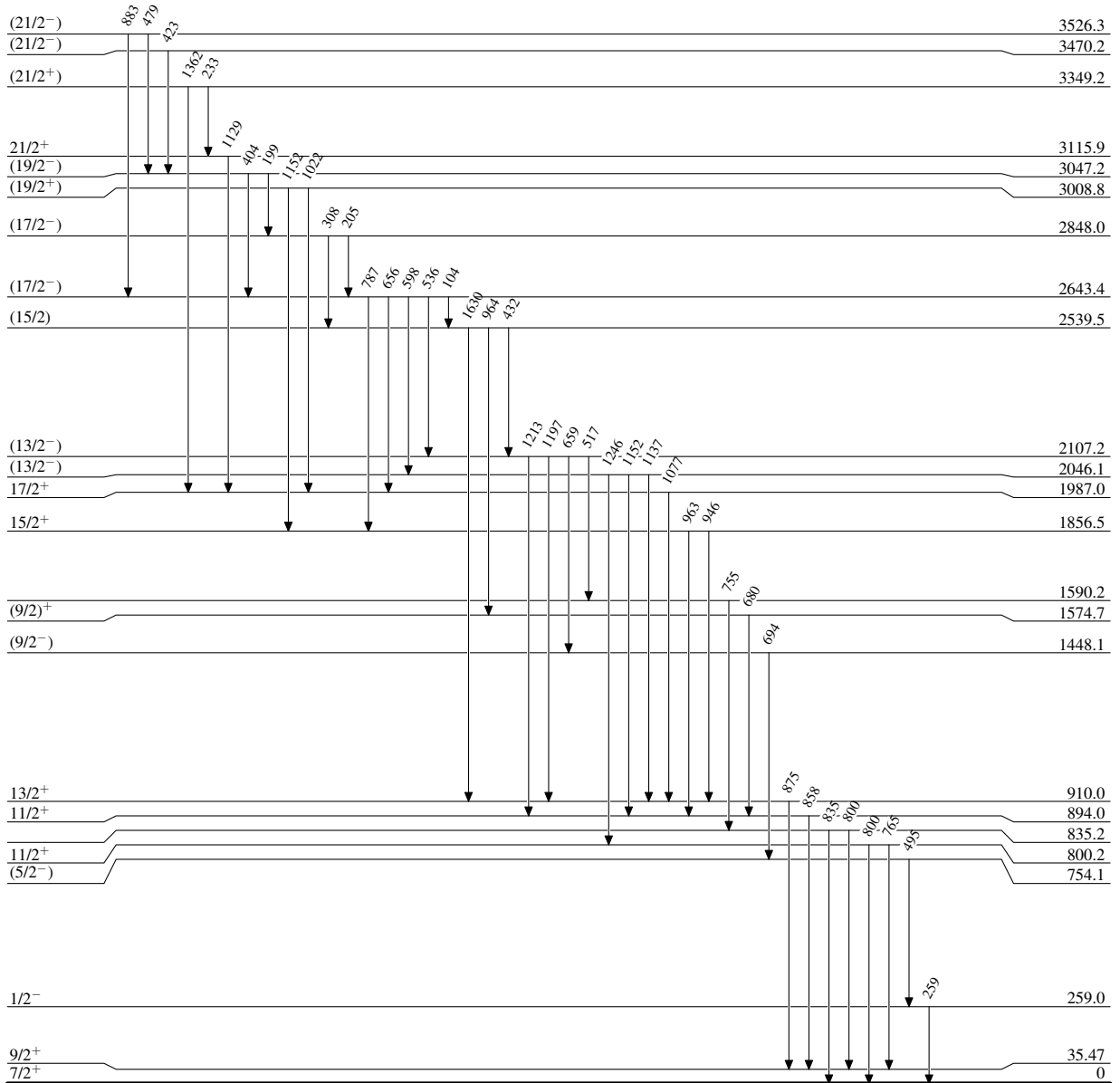
Legend

Level Scheme

-----► γ Decay (Uncertain)

$^{68}\text{Zn}(^{19}\text{F},\text{p}3\text{n}\gamma)$ 1990DoZX,1990DoZT

Level Scheme (continued)



$^{83}_{38}\text{Sr}_{45}$