

^{146}Gd $Z = 64$ $N = 82$ adopted link ENSDF link

Based on ENSDF from Oct 2022, and mass evaluation from 2020

BE = 1204.428 (0.004) MeV

Qbeta+ = 1.032 (0.007) MeV

| | Energy T | J+ | J- | J-other | T1/2 |
|----------|----------|----------|-------|----------------|--------------|
| ----- | | | | | |
| S-alpha= | -0.471 | (0.004) | ----- | | |
| 146GD 1 | 0.000 | 0+ | | | 1 48.27 D 9 |
| 146GD 2 | | | 1.579 | 3- | 2 1.06 NS 12 |
| 146GD 3 | 1.972 | 2+ | | | 3 0.7 PS LT |
| 146GD 4 | 2.165 | 0+ | | | 4 375 PS 40 |
| 146GD 5 | 2.612 | 4+ | | | 5 |
| 146GD 6 | | | 2.658 | 5- | 6 |
| 146GD 7 | 2.968 | 4+ | | | 7 |
| 146GD 8 | | | 2.982 | 7- | 8 6.73 NS 10 |
| 146GD 9 | 2.986 | 2+ | | | 9 |
| 146GD 10 | | | 2.997 | 4- | 10 |
| ----- | | | | | |
| 146GD 11 | 3.020 | 0+ | | | 11 |
| 146GD 12 | 3.031 | 3+ | | | 12 |
| 146GD 13 | | | 3.099 | 6- | 13 |
| 146GD 14 | | | 3.183 | 8- | 14 |
| 146GD 15 | 3.186 | 2+ | | | 15 |
| 146GD 16 | 3.233 | 2+ | | | 16 |
| 146GD 17 | 3.287 | 3+ | | | 17 |
| 146GD 18 | | | 3.290 | 7- | 18 |
| 146GD 19 | | | 3.294 | 8- | 19 300 PS LT |
| 146GD 20 | | | 3.313 | 5- | 20 |
| ----- | | | | | |
| 146GD 21 | | | | 3.320 | 21 |
| 146GD 22 | 3.357 | 2+ | | | 22 |
| 146GD 23 | | | | 3.364 4 | 23 |
| 146GD 24 | 3.381 | 2+ | | | 24 |
| 146GD 25 | | | | 3.383 | 25 |
| 146GD 26 | | | 3.384 | 6- | 26 |
| 146GD 27 | | | | 3.389 (2,1,4+) | 27 |
| 146GD 28 | 3.412 | 4+ | | | 28 |
| 146GD 29 | 3.417 | 4+ | | | 29 |
| 146GD 30 | | | 3.423 | 3- | 30 |
| ----- | | | | | |
| 146GD 31 | | | 3.428 | 9- | 31 300 PS LT |
| 146GD 32 | 3.436 | 4+ | | | 32 |
| 146GD 33 | 3.457 | 4+ | | | 33 |
| 146GD 34 | | | | 3.461 (5-) | 34 |
| 146GD 35 | | | 3.464 | 5- | 35 |
| 146GD 36 | | | | 3.469 | 36 |

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|-------|----|-------|-----|-------|----|-------|------------|--|--------------|
| 146GD | 37 | | | | | 3.478 | | | 37 |
| 146GD | 38 | 3.482 | 3+ | | | | | | 38 |
| 146GD | 39 | 3.485 | 6+ | | | | | | 39 |
| 146GD | 40 | 3.485 | 0+ | | | | | | 40 |
| ----- | | | | | | | | | |
| 146GD | 41 | 3.547 | 2+ | | | | | | 41 |
| 146GD | 42 | | | | | 3.563 | (4+,2+) | | 42 |
| 146GD | 43 | | | | | 3.585 | 4 | | 43 |
| 146GD | 44 | 3.641 | 0+ | | | | | | 44 |
| 146GD | 45 | | | | | 3.656 | 3 | | 45 |
| 146GD | 46 | | | | | 3.660 | (6+) | | 46 |
| 146GD | 47 | | | 3.687 | 5- | | | | 47 |
| 146GD | 48 | | | | | 3.730 | | | 48 |
| 146GD | 49 | | | | | 3.744 | (2+,3-) | | 49 |
| 146GD | 50 | | | | | 3.761 | (4+) | | 50 |
| ----- | | | | | | | | | |
| 146GD | 51 | | | | | 3.779 | (8+) | | 51 |
| 146GD | 52 | | | | | 3.784 | (3,5)+ | | 52 |
| 146GD | 53 | | | | | 3.789 | (2-,3-,4-) | | 53 |
| 146GD | 54 | | | | | 3.854 | (3-) | | 54 |
| 146GD | 55 | | | 3.854 | 7- | | | | 55 |
| 146GD | 56 | 3.865 | 10+ | | | | | | 56 300 PS LT |
| 146GD | 57 | | | 3.867 | 5- | | | | 57 |
| 146GD | 58 | | | | | 3.908 | (3+) | | 58 |
| 146GD | 59 | | | | | 3.947 | (6)+ | | 59 |
| 146GD | 60 | | | | | 3.973 | (3-) | | 60 |
| ----- | | | | | | | | | |
| 146GD | 61 | | | | | 3.987 | | | 61 |
| 146GD | 62 | | | | | 4.007 | (4+) | | 62 |
| 146GD | 63 | | | | | 4.027 | (6,8) | | 63 |
| 146GD | 64 | | | | | 4.077 | | | 64 |
| 146GD | 65 | 4.108 | 8+ | | | | | | 65 |
| 146GD | 66 | | | | | 4.113 | | | 66 |
| 146GD | 67 | | | | | 4.118 | | | 67 |
| 146GD | 68 | | | | | 4.123 | (5-) | | 68 |
| 146GD | 69 | | | | | 4.131 | (3,5) | | 69 |
| 146GD | 70 | | | | | 4.152 | (2,4) | | 70 |
| ----- | | | | | | | | | |
| 146GD | 71 | | | | | 4.167 | (4,6) | | 71 |
| 146GD | 72 | | | | | 4.179 | (6) | | 72 |
| 146GD | 73 | | | | | 4.216 | (2,4) | | 73 |
| 146GD | 74 | | | | | 4.230 | (5-) | | 74 |
| 146GD | 75 | | | | | 4.248 | (7,9) | | 75 |
| 146GD | 76 | | | | | 4.260 | | | 76 |
| 146GD | 77 | | | | | 4.286 | | | 77 |
| 146GD | 78 | | | | | 4.300 | (2+) | | 78 |
| 146GD | 79 | | | | | 4.319 | (6-,7+,8-) | | 79 |
| 146GD | 80 | | | | | 4.327 | (3,5) | | 80 |
| ----- | | | | | | | | | |
| 146GD | 81 | | | | | 4.341 | (4-) | | 81 |

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|-----------|-------|-----|-------|-------|----------|-----|
| 146GD 82 | | | | 4.355 | (5) | 82 |
| 146GD 83 | | | | 4.372 | (4+) | 83 |
| 146GD 84 | | | | 4.376 | (4+) | 84 |
| 146GD 85 | | | | 4.390 | (5,7) | 85 |
| 146GD 86 | | | | 4.399 | (5-,7-) | 86 |
| 146GD 87 | | | | 4.409 | | 87 |
| 146GD 88 | | | | 4.417 | (10-,8-) | 88 |
| 146GD 89 | | | | 4.459 | (7-,9) | 89 |
| 146GD 90 | | | | 4.484 | (4+) | 90 |
| ----- | | | | | | |
| 146GD 91 | | | | 4.485 | (11-) | 91 |
| 146GD 92 | 4.502 | 10+ | | | | 92 |
| 146GD 93 | | | | 4.521 | | 93 |
| 146GD 94 | | | | 4.529 | | 94 |
| 146GD 95 | | | | 4.533 | (3,5) | 95 |
| 146GD 96 | 4.534 | 0+ | | | | 96 |
| 146GD 97 | 4.541 | 10+ | | | | 97 |
| 146GD 98 | | | | 4.580 | 7 | 98 |
| 146GD 99 | | | | 4.596 | (2+,3-) | 99 |
| 146GD 100 | | | | 4.608 | 8,10- | 100 |
| ----- | | | | | | |
| 146GD 101 | | | | 4.638 | (5-,6+) | 101 |
| 146GD 102 | | | | 4.646 | (11-) | 102 |
| 146GD 103 | | | | 4.656 | | 103 |
| 146GD 104 | | | | 4.667 | (12+) | 104 |
| 146GD 105 | | | | 4.686 | (2+,3-) | 105 |
| 146GD 106 | | | 4.719 | 4- | | 106 |
| 146GD 107 | | | | 4.726 | (2+,3-) | 107 |
| 146GD 108 | | | | 4.730 | (9+,7+) | 108 |
| 146GD 109 | | | | 4.747 | (2+,3-) | 109 |
| 146GD 110 | | | | 4.781 | | 110 |
| ----- | | | | | | |
| 146GD 111 | | | | 4.782 | 8,6 | 111 |
| 146GD 112 | | | | 4.793 | (2+,3-) | 112 |
| 146GD 113 | | | | 4.802 | | 113 |
| 146GD 114 | | | | 4.825 | (2+,3-) | 114 |
| 146GD 115 | | | | 4.829 | (4,5)- | 115 |
| 146GD 116 | | | | 4.848 | (9,7) | 116 |
| 146GD 117 | | | | 4.880 | (2+,3-) | 117 |
| 146GD 118 | | | | 4.880 | (10,8) | 118 |
| 146GD 119 | | | | 4.898 | (9,7) | 119 |
| 146GD 120 | | | | 4.905 | | 120 |
| ----- | | | | | | |
| 146GD 121 | | | | 4.941 | (2+) | 121 |
| 146GD 122 | | | | 4.943 | | 122 |
| 146GD 123 | | | | 4.976 | (2+,3-) | 123 |
| 146GD 124 | | | | 5.044 | (2+) | 124 |
| 146GD 125 | | | | 5.056 | | 125 |
| 146GD 126 | | | | 5.086 | (2+,3-) | 126 |
| 146GD 127 | 5.095 | 11+ | | | | 127 |

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| 146GD 128 | | | | 5.115 | | 128 |
| 146GD 129 | | | | 5.151 | | 129 |
| 146GD 130 | | | | 5.165 | (11,9) | 130 |
| ----- | | | | | | |
| 146GD 131 | | | | 5.177 | | 131 |
| 146GD 132 | | | | 5.217 | | 132 |
| 146GD 133 | | | | 5.258 | (2+) | 133 |
| 146GD 134 | | 5.278 | 11+ | | | 134 |
| 146GD 135 | | | | 5.289 | | 135 |
| 146GD 136 | | | | 5.321 | | 136 |
| 146GD 137 | | | | 5.342 | (4+,5-) | 137 |
| 146GD 138 | | 5.351 | 12+ | | | 138 |
| S-p | = | 5.383 | (0.005) | ----- | | |
| 146GD 139 | | | | 5.388 | | 139 |
| 146GD 140 | | | | 5.443 | | 140 |
| ----- | | | | | | |
| 146GD 141 | | 5.448 | 12+ | | | 141 |
| 146GD 142 | | | | 5.482 | | 142 |
| 146GD 143 | | | | 5.528 | | 143 |
| 146GD 144 | | | | 5.529 | (12+) | 144 |
| 146GD 145 | | | | 5.549 | | 145 |
| 146GD 146 | | | | 5.701 | (12)+ | 146 |
| 146GD 147 | | | | 5.730 | (12)+ | 147 |
| 146GD 148 | | 5.792 | 13+ | | | 148 |
| 146GD 149 | | 5.894 | 14+ | | | 149 |
| 146GD 150 | | 5.996 | 14+ | | | 150 |
| ----- | | | | | | |
| 146GD 151 | | 6.120 | 15+ | | | 151 |
| 146GD 152 | | 6.399 | 16+ | | | 152 |
| 146GD 153 | | | | 6.470 | | 153 |
| 146GD 154 | | | | 6.820 | 17(+) | 154 |
| 146GD 155 | | | | 7.034 | 16- | 155 |
| 146GD 156 | | | | 7.165 | 17- | 156 |
| 146GD 157 | | | | 7.202 | | 157 |
| 146GD 158 | | 7.513 | 16+ | | | 158 |
| 146GD 159 | | | | 7.566 | 17- | 159 |
| 146GD 160 | | | | 7.659 | | 160 |
| ----- | | | | | | |
| 146GD 161 | | 7.739 | 17+ | | | 161 |
| 146GD 162 | | | | 8.000 | (18+) | 162 |
| 146GD 163 | | 8.030 | 18+ | | | 163 1.5 NS 6 |
| 146GD 164 | | | | 8.077 | | 164 |
| 146GD 165 | | | | 8.368 | (18+) | 165 |
| 146GD 166 | | | | 8.650 | (19-) | 166 |
| 146GD 167 | | | | 8.666 | (19+) | 167 |
| S-2p | = | 8.698 | (0.004) | ----- | | |
| 146GD 168 | | | | 8.804 | | 168 |
| 146GD 169 | | | 8.916 | 20- | | 169 4.3 NS 3 |
| 146GD 170 | | | | 9.083 | (20+) | 170 |
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|-----------|--|--|--|-------|-------|-----|
| 146GD 171 | | | | 9.226 | (21-) | 171 |
| 146GD 172 | | | | 9.254 | | 172 |
| 146GD 173 | | | | 9.257 | (21-) | 173 |
| 146GD 174 | | | | 9.482 | (22-) | 174 |
| 146GD 175 | | | | 9.495 | | 175 |
| 146GD 176 | | | | 9.527 | (22-) | 176 |
| 146GD 177 | | | | 9.745 | | 177 |
| 146GD 178 | | | | 9.963 | (22-) | 178 |

S-p = 5.383 (0.005)-----
S-n = 11.230 (0.020)-----
S-2p = 8.698 (0.004)-----
S-2n = 20.469 (0.028)-----
S-alpha= -0.471 (0.004)-----

S+p = -1.946 (0.009)
S+n = -7.343 (0.004)
S+2p = -6.352 (0.010)
S+2n = -16.326 (0.004)
S+alpha = 4.351 (0.006)

gap p = 3.437 (0.010)
gap n = 3.888 (0.021)
gap 2p = 2.347 (0.011)
gap 2n = 4.143 (0.029)
gap alpha = 3.880 (0.007)