

$^{147}\text{Eu}$        $Z = 63$        $N = 84$       adopted link      ENSDF link

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

BE = 1214.740 ( 0.003) MeV

Qbeta+ = 1.721 ( 0.003) MeV

|          | Energy T | J+       | J-    | J-other | T1/2                |
|----------|----------|----------|-------|---------|---------------------|
| -----    |          |          |       |         |                     |
| S-alpha= | -2.991   | ( 0.004) | ----- |         |                     |
| 147EU 1  | 0.000    | 5/2+     |       |         | 1 24.1 D 6          |
| 147EU 2  | 0.229    | 7/2+     |       |         | 2 0.18 NS 2         |
| 147EU 3  |          |          | 0.625 | 11/2-   | 3 0.765 US 15       |
| 147EU 4  |          |          |       | 0.755   | 3/2+,5/2+ 4         |
| 147EU 5  | 0.776    | 9/2+     |       |         | 5                   |
| 147EU 6  | 0.778    | 7/2+     |       |         | 6                   |
| 147EU 7  |          |          |       | 0.828   | (3/2+,5/2+,7/2+) 7  |
| 147EU 8  |          |          |       | 0.862   | 5/2+,7/2+ 8         |
| 147EU 9  |          |          | 0.995 | 9/2-    | 9                   |
| 147EU 10 |          |          |       | 0.996   | (+) 10              |
| -----    |          |          |       |         |                     |
| 147EU 11 |          |          |       | 1.007   | 5/2+,7/2+,9/2+ 11   |
| 147EU 12 |          |          |       | 1.012   | 5/2+,7/2+,9/2+ 12   |
| 147EU 13 | 1.034    | 11/2+    |       |         | 13                  |
| 147EU 14 |          |          | 1.069 | 7/2-    | 14                  |
| 147EU 15 | 1.123    | 7/2+     |       |         | 15                  |
| 147EU 16 |          |          |       | 1.213   | 5/2-,7/2- 16        |
| 147EU 17 |          |          | 1.236 | 7/2-    | 17                  |
| 147EU 18 |          |          | 1.244 | 11/2-   | 18                  |
| 147EU 19 |          |          |       | 1.289   | (11/2-) 19          |
| 147EU 20 |          |          |       | 1.338   | 5/2+,7/2+,9/2+ 20   |
| -----    |          |          |       |         |                     |
| 147EU 21 |          |          |       | 1.339   | 7/2-,9/2-,11/2- 21  |
| 147EU 22 |          |          | 1.346 | 15/2-   | 22                  |
| 147EU 23 |          |          | 1.360 | 9/2-    | 23                  |
| 147EU 24 |          |          |       | 1.378   | + 24                |
| 147EU 25 |          |          |       | 1.390   | 5/2-,7/2-,9/2- 25   |
| 147EU 26 | 1.399    | 3/2+     |       |         | 26                  |
| 147EU 27 |          |          | 1.415 | 13/2-   | 27                  |
| 147EU 28 | 1.421    | 13/2+    |       |         | 28                  |
| 147EU 29 |          |          |       | 1.465   | (5/2-,7/2-,9/2- 29) |
| 147EU 30 |          |          |       | 1.475   | (3/2+) 30           |
| -----    |          |          |       |         |                     |
| 147EU 31 |          |          | 1.554 | 9/2-    | 31                  |
| 147EU 32 |          |          |       | 1.565   | 7/2+,9/2+ 32        |
| 147EU 33 | 1.647    | 15/2+    |       |         | 33                  |
| 147EU 34 | 1.696    | 7/2+     |       |         | 34                  |
| 147EU 35 |          |          |       | 1.757   | (11/2,15/2) 35      |
| 147EU 36 |          |          |       | 1.772   | 5/2+,7/2+,9/2+ 36   |

|          |   |                |      |       |       |       |                 |    |
|----------|---|----------------|------|-------|-------|-------|-----------------|----|
| 147EU 37 |   |                |      |       |       | 1.774 | 5/2(-):9/2(-)   | 37 |
| 147EU 38 |   |                |      |       |       | 1.795 | 5/2-,7/2-       | 38 |
| 147EU 39 |   |                |      |       |       | 1.807 | 5/2+,7/2+,9/2+  | 39 |
| 147EU 40 |   |                |      |       |       | 1.816 | 5/2+,7/2+       | 40 |
| -----    |   |                |      |       |       |       |                 |    |
| 147EU 41 |   |                |      |       |       | 1.828 |                 | 41 |
| 147EU 42 |   |                |      |       |       | 1.833 | (17/2+)         | 42 |
| 147EU 43 |   |                |      |       |       | 1.838 |                 | 43 |
| 147EU 44 |   |                |      |       |       | 1.858 | 7/2-,9/2+       | 44 |
| 147EU 45 |   |                |      |       |       | 1.875 | 7/2-,9/2-       | 45 |
| 147EU 46 |   | 1.906          | 5/2+ |       |       |       |                 | 46 |
| 147EU 47 |   |                |      |       |       | 1.910 | 5/2,7/2,9/2+    | 47 |
| 147EU 48 |   |                |      | 1.926 | 19/2- |       |                 | 48 |
| 147EU 49 |   |                |      |       |       | 1.951 | 5/2-,7/2-,9/2-  | 49 |
| 147EU 50 |   |                |      |       |       | 1.961 | 5/2+,7/2,9/2+   | 50 |
| -----    |   |                |      |       |       |       |                 |    |
| 147EU 51 |   |                |      |       |       | 1.987 | 5/2(-),7/2,9/2+ | 51 |
| 147EU 52 |   |                |      |       |       | 1.995 | 7/2-,9/2-       | 52 |
| 147EU 53 |   |                |      |       |       | 2.002 |                 | 53 |
| 147EU 54 |   |                |      |       |       | 2.014 | (17/2-)         | 54 |
| 147EU 55 |   |                |      |       |       | 2.165 | 5/2-,7/2-,9/2-  | 55 |
| 147EU 56 |   |                |      | 2.293 | 23/2- |       |                 | 56 |
| 147EU 57 |   |                |      | 2.348 | 21/2- |       |                 | 57 |
| 147EU 58 |   |                |      |       |       | 2.504 | (19/2+)         | 58 |
| 147EU 59 |   |                |      |       |       | 2.845 | 19/2-,23/2-     | 59 |
| 147EU 60 |   |                |      | 2.900 | 27/2- |       |                 | 60 |
| -----    |   |                |      |       |       |       |                 |    |
| 147EU 61 |   |                |      |       |       | 2.996 | 23/2(+)         | 61 |
| 147EU 62 |   |                |      |       |       | 3.191 | 25/2(-)         | 62 |
| 147EU 63 |   |                |      |       |       | 3.230 | 27/2(+)         | 63 |
| 147EU 64 |   |                |      |       |       | 3.523 | 29/2(+)         | 64 |
| 147EU 65 |   |                |      |       |       | 3.795 | 31/2(+)         | 65 |
| -----    |   |                |      |       |       |       |                 |    |
| S-p      | = | 3.837 ( 0.004) |      |       | ----- |       |                 |    |
| 147EU 66 |   |                |      |       |       | 4.178 | 33/2(+)         | 66 |
| 147EU 67 |   |                |      |       |       | 4.242 | 31/2(-)         | 67 |
| 147EU 68 |   |                |      |       |       | 4.284 | 31/2(-)         | 68 |
| 147EU 69 |   |                |      |       |       | 4.612 | 33/2(+)         | 69 |
| 147EU 70 |   |                |      |       |       | 4.639 | (33/2-)         | 70 |
| -----    |   |                |      |       |       |       |                 |    |
| 147EU 71 |   |                |      |       |       | 4.677 | (35/2)          | 71 |
| 147EU 72 |   |                |      |       |       | 4.801 | 33/2(+)         | 72 |
| 147EU 73 |   |                |      |       |       | 4.862 | 35/2            | 73 |
| 147EU 74 |   |                |      |       |       | 4.881 | (35/2)          | 74 |
| 147EU 75 |   |                |      |       |       | 4.907 | 35/2            | 75 |
| 147EU 76 |   |                |      |       |       | 5.056 | 35/2(+)         | 76 |
| 147EU 77 |   |                |      |       |       | 5.083 | 37/2(+)         | 77 |
| 147EU 78 |   |                |      |       |       | 5.176 | 35/2,39/2       | 78 |
| 147EU 79 |   |                |      |       |       | 5.333 | 37/2(+)         | 79 |
| 147EU 80 |   |                |      |       |       | 5.373 | 35/2,39/2       | 80 |
| -----    |   |                |      |       |       |       |                 |    |

|                           |       |  |       |         |     |
|---------------------------|-------|--|-------|---------|-----|
| 147EU 81                  |       |  | 5.381 | 37/2(+) | 81  |
| 147EU 82                  |       |  | 5.432 |         | 82  |
| 147EU 83                  |       |  | 5.456 | 37/2    | 83  |
| 147EU 84                  |       |  | 5.595 | 39/2(+) | 84  |
| 147EU 85                  |       |  | 5.685 |         | 85  |
| 147EU 86                  |       |  | 5.772 | 41/2(+) | 86  |
| 147EU 87                  |       |  | 6.024 |         | 87  |
| 147EU 88                  |       |  | 6.333 | 43/2(+) | 88  |
| 147EU 89                  |       |  | 6.510 | 43/2    | 89  |
| 147EU 90                  |       |  | 6.664 | 43/2    | 90  |
| -----                     |       |  |       |         |     |
| 147EU 91                  |       |  | 6.703 | 43/2    | 91  |
| 147EU 92                  |       |  | 6.713 | 43/2    | 92  |
| 147EU 93                  |       |  | 6.817 |         | 93  |
| 147EU 94                  |       |  | 6.847 | 45/2    | 94  |
| 147EU 95                  |       |  | 6.857 |         | 95  |
| 147EU 96                  |       |  | 6.867 | 45/2    | 96  |
| 147EU 97                  |       |  | 6.963 | 45/2(+) | 97  |
| 147EU 98                  |       |  | 6.966 | 45/2(-) | 98  |
| 147EU 99                  |       |  | 7.069 |         | 99  |
| 147EU 100                 |       |  | 7.168 | 47/2(-) | 100 |
| -----                     |       |  |       |         |     |
| 147EU 101                 |       |  | 7.419 |         | 101 |
| 147EU 102                 |       |  | 7.630 |         | 102 |
| 147EU 103                 |       |  | 7.682 | 49/2(-) | 103 |
| 147EU 104                 |       |  | 7.960 |         | 104 |
| 147EU 105                 |       |  | 8.010 |         | 105 |
| 147EU 106                 |       |  | 8.057 |         | 106 |
| 147EU 107                 |       |  | 8.142 |         | 107 |
| S-n = 8.498 ( 0.007)      | ----- |  |       |         |     |
| 147EU 108                 |       |  | 8.512 |         | 108 |
| 147EU 109                 |       |  | 8.613 | 51/2(-) | 109 |
| 147EU 110                 |       |  | 8.727 |         | 110 |
| -----                     |       |  |       |         |     |
| 147EU 111                 |       |  | 8.777 | 53/2(-) | 111 |
| 147EU 112                 |       |  | 9.269 |         | 112 |
| 147EU 113                 |       |  | 9.643 |         | 113 |
| -----                     |       |  |       |         |     |
| S-p = 3.837 ( 0.004)      | ----- |  |       |         |     |
| S-n = 8.498 ( 0.007)      | ----- |  |       |         |     |
| S-2p = 10.855 ( 0.004)    | ----- |  |       |         |     |
| S-2n = 15.696 ( 0.004)    | ----- |  |       |         |     |
| S-alpha = -2.991 ( 0.004) | ----- |  |       |         |     |
|                           |       |  |       |         |     |
| S+p = -6.014 ( 0.003)     |       |  |       |         |     |
| S+n = -6.824 ( 0.010)     |       |  |       |         |     |
| S+2p = -8.522 ( 0.004)    |       |  |       |         |     |
| S+2n = -15.039 ( 0.005)   |       |  |       |         |     |
| S+alpha = 3.496 ( 0.005)  |       |  |       |         |     |

gap p = -2.177 ( 0.005)  
gap n = 1.674 ( 0.012)  
gap 2p = 2.333 ( 0.006)  
gap 2n = 0.656 ( 0.006)  
gap alpha = 0.505 ( 0.006)