

$^{140}\text{Sm}$        $Z = 62$        $N = 78$       [link to full NNDC output](#)

Based on ENSDF from Dec 2018, and mass evaluation from 2016

BE = 1156.935 ( 0.012) MeV

Qbeta+ = 2.758 ( 0.027) MeV

|          | Energy T | J+       | J-    | J-other        | T1/2          |
|----------|----------|----------|-------|----------------|---------------|
| -----    |          |          |       |                |               |
| S-alpha= | -1.318   | ( 0.017) | ----- |                |               |
| 140SM 1  | 0.000    | 0+       |       |                | 1 14.82 M 12  |
| 140SM 2  | 0.531    | 2+       |       |                | 2             |
| 140SM 3  |          |          |       | 0.990 (0+)     | 3             |
| 140SM 4  | 1.246    | 4+       |       |                | 4             |
| 140SM 5  |          |          |       | 1.420 (1,2)    | 5             |
| 140SM 6  | 1.599    | 2+       |       |                | 6             |
| 140SM 7  |          |          |       | 1.628 (0+)     | 7             |
| 140SM 8  |          |          |       | 1.933 (0+)     | 8             |
| 140SM 9  |          |          |       | 2.015 5        | 9             |
| 140SM 10 | 2.082    | 6+       |       |                | 10            |
| -----    |          |          |       |                |               |
| 140SM 11 | 2.284    | 2+       |       |                | 11            |
| 140SM 12 |          |          |       | 2.290 (1,2)    | 12            |
| 140SM 13 |          |          |       | 2.326 7        | 13            |
| 140SM 14 |          |          |       | 2.482 (1,2)+   | 14            |
| 140SM 15 |          |          |       | 2.596 (0+)     | 15            |
| 140SM 16 |          |          |       | 2.959 (6,7,8)  | 16            |
| 140SM 17 | 2.970    | 8+       |       |                | 17            |
| 140SM 18 |          |          |       | 3.128 9        | 18            |
| 140SM 19 | 3.172    | 10+      |       |                | 19 19.4 NS 7  |
| 140SM 20 |          |          |       | 3.194 8(+)     | 20            |
| -----    |          |          |       |                |               |
| 140SM 21 | 3.211    | 10+      |       |                | 21 5.20 NS 14 |
| 140SM 22 | 3.653    | 12+      |       |                | 22 15.2 NS 21 |
| 140SM 23 | 3.791    | 12+      |       |                | 23 7.6 NS 21  |
| 140SM 24 |          |          |       | 3.892 11       | 24            |
| 140SM 25 |          |          |       | 4.024 11       | 25            |
| 140SM 26 |          |          |       | 4.044 11       | 26            |
| 140SM 27 | 4.404    | 14+      |       |                | 27 1.2 PS 5   |
| 140SM 28 |          |          |       | 4.446 (13)     | 28            |
| 140SM 29 |          |          |       | 4.488          | 29            |
| 140SM 30 |          |          |       | 4.622 15       | 30            |
| -----    |          |          |       |                |               |
| 140SM 31 |          |          |       | 4.683 11,12,13 | 31            |
| 140SM 32 |          |          |       | 4.854 13       | 32            |
| 140SM 33 |          |          |       | 4.914 14(+)    | 33            |
| 140SM 34 |          |          |       | 4.947 16       | 34            |
| 140SM 35 |          |          |       | 4.990 13       | 35            |
| 140SM 36 |          |          |       | 5.088 (14)     | 36            |

|                            |    |        |          |       |      |    |
|----------------------------|----|--------|----------|-------|------|----|
| 140SM                      | 37 |        |          | 5.194 | 14   | 37 |
| S-p = 5.244 ( 0.018)-----  |    |        |          |       |      |    |
| 140SM                      | 38 |        |          | 5.254 | 15   | 38 |
| 140SM                      | 39 |        |          | 5.329 | 17   | 39 |
| 140SM                      | 40 |        |          | 5.373 | (15) | 40 |
| -----                      |    |        |          |       |      |    |
| 140SM                      | 41 |        |          | 5.394 |      | 41 |
| 140SM                      | 42 |        |          | 5.398 | 16   | 42 |
| 140SM                      | 43 |        |          | 5.479 | 15   | 43 |
| 140SM                      | 44 |        |          | 5.490 | 16   | 44 |
| 140SM                      | 45 |        |          | 5.499 | 15   | 45 |
| 140SM                      | 46 |        |          | 5.572 | 15   | 46 |
| 140SM                      | 47 |        |          | 5.706 | 16   | 47 |
| 140SM                      | 48 |        |          | 5.794 | (18) | 48 |
| 140SM                      | 49 |        |          | 5.811 | 16   | 49 |
| 140SM                      | 50 |        |          | 5.893 |      | 50 |
| -----                      |    |        |          |       |      |    |
| 140SM                      | 51 |        |          | 5.998 |      | 51 |
| 140SM                      | 52 |        |          | 6.024 | 17   | 52 |
| 140SM                      | 53 |        |          | 6.039 | 17   | 53 |
| 140SM                      | 54 |        |          | 6.166 | 16   | 54 |
| 140SM                      | 55 |        |          | 6.272 | 18   | 55 |
| 140SM                      | 56 |        |          | 6.397 | 18   | 56 |
| 140SM                      | 57 |        |          | 6.420 |      | 57 |
| 140SM                      | 58 |        |          | 6.436 |      | 58 |
| 140SM                      | 59 |        |          | 6.549 | 18   | 59 |
| 140SM                      | 60 |        |          | 6.726 |      | 60 |
| -----                      |    |        |          |       |      |    |
| 140SM                      | 61 |        |          | 6.755 | 19   | 61 |
| 140SM                      | 62 |        |          | 6.779 |      | 62 |
| 140SM                      | 63 |        |          | 6.864 | 19   | 63 |
| 140SM                      | 64 |        |          | 7.092 |      | 64 |
| 140SM                      | 65 |        |          | 7.269 |      | 65 |
| 140SM                      | 66 |        |          | 7.320 | (20) | 66 |
| 140SM                      | 67 |        |          | 7.546 |      | 67 |
| 140SM                      | 68 |        |          | 7.752 |      | 68 |
| 140SM                      | 69 |        |          | 7.773 | (20) | 69 |
| S-2p = 8.016 ( 0.017)----- |    |        |          |       |      |    |
| 140SM                      | 70 |        |          | 8.041 |      | 70 |
| -----                      |    |        |          |       |      |    |
| 140SM                      | 71 |        |          | 8.101 |      | 71 |
| -----                      |    |        |          |       |      |    |
| S-p                        | =  | 5.244  | ( 0.018) | ----- |      |    |
| S-n                        | =  | 11.147 | ( 0.017) | ----- |      |    |
| S-2p                       | =  | 8.016  | ( 0.017) | ----- |      |    |
| S-2n                       | =  | 20.101 | ( 0.017) | ----- |      |    |
| S-alpha                    | =  | -1.318 | ( 0.017) | ----- |      |    |
| S+p                        | =  | -1.759 | ( 0.018) | ----- |      |    |

S+n = -8.549 ( 0.015)  
S+2p = -6.082 ( 0.031)  
S+2n = -19.673 ( 0.013)  
S+alpha = 1.272 ( 0.031)

gap p = 3.486 ( 0.026)  
gap n = 2.598 ( 0.022)  
gap 2p = 1.934 ( 0.035)  
gap 2n = 0.428 ( 0.021)  
gap alpha = -0.047 ( 0.035)