

$^{50}\text{V}$        $Z = 23$        $N = 27$       adopted link      ENSDF link

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

BE = 434.795 ( 0.000) MeV  
 Qbeta- = 1.038 ( 0.000) MeV  
 Qbeta+ = 2.209 ( 0.000) MeV

|     | Energy T   | J+ | J- | J-other           | T1/2               |
|-----|------------|----|----|-------------------|--------------------|
| 50V | 1   0.000  | 6+ |    |                   | 1 2.65E+17 Y+16-18 |
| 50V | 2   0.226  | 5+ |    |                   | 2 3.7 PS LT        |
| 50V | 3   0.320  | 4+ |    |                   | 3 54 PS +19-14     |
| 50V | 4   0.356  | 3+ |    |                   | 4 3 NS LT          |
| 50V | 5   0.389  | 2+ |    |                   | 5                  |
| 50V | 6   0.836  | 5+ |    |                   | 6 38 FS 14         |
| 50V | 7          |    |    | 0.910 (7)+        | 7 43 FS 8          |
| 50V | 8   0.910  | 4+ |    |                   | 8 70 FS 9          |
| 50V | 9   1.302  | 2+ |    |                   | 9 46 FS 8          |
| 50V | 10   1.332 | 1+ |    |                   | 10 17 FS 6         |
| 50V | 11   1.402 | 3+ |    |                   | 11 0.8 PS GT       |
| 50V | 12   1.495 | 1+ |    |                   | 12 45 FS 7         |
| 50V | 13   1.518 | 2+ |    |                   | 13 148 FS 22       |
| 50V | 14   1.562 | 2+ |    |                   | 14 0.7 PS +4-2     |
| 50V | 15   1.677 | 3+ |    |                   | 15 0.32 PS GT      |
| 50V | 16         |    |    | 1.700 (3+,4+,5+)  | 16 0.35 PS 10      |
| 50V | 17         |    |    | 1.703 (3+,4+,5+)  | 17                 |
| 50V | 18         |    |    | 1.719 (1+,2,3,4+) | 18                 |
| 50V | 19         |    |    | 1.724 (8)+        | 19 0.14 PS 6       |
| 50V | 20         |    |    | 1.725 (3+,4,5,6+) | 20                 |
| 50V | 21         |    |    | 1.753 3+,4+,5+    | 21 1.3 PS GT       |
| 50V | 22         |    |    | 1.762 (4+,5+)     | 22 5 FS LT         |
| 50V | 23         |    |    | 1.762 (3+,4+,5+)  | 23                 |
| 50V | 24         |    |    | 1.813 (2,3)+      | 24 2.9 PS GT       |
| 50V | 25         |    |    | 1.881 (4+,5+,6+)  | 25 15 FS 8         |
| 50V | 26         |    |    | 1.936 (0:5)+      | 26                 |
| 50V | 27   1.955 | 1+ |    |                   | 27                 |
| 50V | 28         |    |    | 1.984 (0:7)+      | 28                 |
| 50V | 29         |    |    | 2.038 3+,4+,5+    | 29                 |
| 50V | 30         |    |    | 2.111 3+,4+,5+    | 30                 |
| 50V | 31         |    |    | 2.132 3+,4+,5+    | 31                 |
| 50V | 32         |    |    | 2.162 3-,4-       | 32                 |
| 50V | 33         |    |    | 2.313 2+,3+,4+,5+ | 33                 |
| 50V | 34         |    |    | 2.344 3+,4+,5+    | 34                 |
| 50V | 35         |    |    | 2.398 (2:5)+      | 35                 |
| 50V | 36         |    |    | 2.424 3-,4-       | 36                 |

|       |    |       |    |  |  |       |            |                   |
|-------|----|-------|----|--|--|-------|------------|-------------------|
| 50V   | 37 | 2.425 | 1+ |  |  |       |            | 37                |
| 50V   | 38 |       |    |  |  | 2.455 | 3+,4+,5+   | 38                |
| 50V   | 39 |       |    |  |  | 2.478 | (9)+       | 39 0.24 PS +28-14 |
| 50V   | 40 |       |    |  |  | 2.482 | (0:7)+     | 40                |
| ----- |    |       |    |  |  |       |            |                   |
| 50V   | 41 |       |    |  |  | 2.495 | (0:7)+     | 41                |
| 50V   | 42 |       |    |  |  | 2.511 | 3-,4-      | 42                |
| 50V   | 43 | 2.532 | 1+ |  |  |       |            | 43                |
| 50V   | 44 |       |    |  |  | 2.533 | 3-,4-      | 44                |
| 50V   | 45 |       |    |  |  | 2.597 | 3-,4-      | 45                |
| 50V   | 46 |       |    |  |  | 2.652 | (2:5)+     | 46                |
| 50V   | 47 |       |    |  |  | 2.736 | (3,4,5)+   | 47                |
| 50V   | 48 |       |    |  |  | 2.762 | (5,6,7)+   | 48                |
| 50V   | 49 |       |    |  |  | 2.791 | 1+,2+,3+   | 49                |
| 50V   | 50 | 2.816 | 1+ |  |  |       |            | 50                |
| ----- |    |       |    |  |  |       |            |                   |
| 50V   | 51 |       |    |  |  | 2.828 |            | 51                |
| 50V   | 52 |       |    |  |  | 2.842 | (5+,6+,7+) | 52                |
| 50V   | 53 |       |    |  |  | 2.877 | 3-,4-      | 53                |
| 50V   | 54 |       |    |  |  | 2.893 | (1:6)-     | 54                |
| 50V   | 55 |       |    |  |  | 2.928 | (0:7)+     | 55                |
| 50V   | 56 |       |    |  |  | 2.957 | (1:6)-     | 56                |
| 50V   | 57 |       |    |  |  | 2.966 | (3:5)+     | 57                |
| 50V   | 58 | 2.991 | 1+ |  |  |       |            | 58                |
| 50V   | 59 |       |    |  |  | 3.014 | (3:7)+     | 59                |
| 50V   | 60 |       |    |  |  | 3.096 | (2:5)+     | 60                |
| ----- |    |       |    |  |  |       |            |                   |
| 50V   | 61 |       |    |  |  | 3.111 | (1:6)-     | 61                |
| 50V   | 62 | 3.139 | 3+ |  |  |       |            | 62                |
| 50V   | 63 |       |    |  |  | 3.169 | 1+,2+,3+   | 63                |
| 50V   | 64 |       |    |  |  | 3.202 | 3-,4-      | 64                |
| 50V   | 65 | 3.219 | 1+ |  |  |       |            | 65                |
| 50V   | 66 |       |    |  |  | 3.269 | 3+,4+,5+   | 66                |
| 50V   | 67 |       |    |  |  | 3.293 | 3+,4+,5+   | 67                |
| 50V   | 68 |       |    |  |  | 3.311 |            | 68                |
| 50V   | 69 |       |    |  |  | 3.402 | (0:7)+     | 69                |
| 50V   | 70 |       |    |  |  | 3.431 | (2:5)+     | 70                |
| ----- |    |       |    |  |  |       |            |                   |
| 50V   | 71 | 3.462 | 1+ |  |  |       |            | 71                |
| 50V   | 72 |       |    |  |  | 3.520 | (1:6)-     | 72                |
| 50V   | 73 |       |    |  |  | 3.537 | (2:5)+     | 73                |
| 50V   | 74 |       |    |  |  | 3.542 | (1:6)-     | 74                |
| 50V   | 75 |       |    |  |  | 3.555 | (0,1)+     | 75                |
| 50V   | 76 |       |    |  |  | 3.606 | (0:7)      | 76                |
| 50V   | 77 |       |    |  |  | 3.668 | 2+,3+      | 77                |
| 50V   | 78 |       |    |  |  | 3.700 | (2:5)+     | 78                |
| 50V   | 79 | 3.721 | 1+ |  |  |       |            | 79                |
| 50V   | 80 |       |    |  |  | 3.729 | (10+)      | 80 28 FS +56-28   |
| ----- |    |       |    |  |  |       |            |                   |
| 50V   | 81 |       |    |  |  | 3.749 | (1+,3-,4-) | 81                |

|       |     |       |    |  |         |          |              |
|-------|-----|-------|----|--|---------|----------|--------------|
| 50V   | 82  | 3.769 | 1+ |  |         |          | 82           |
| 50V   | 83  | 3.796 | 3+ |  |         |          | 83           |
| 50V   | 84  |       |    |  | 3.811   | 3+,4+,5+ | 84           |
| 50V   | 85  |       |    |  | 3.846   | 1+,2+,3+ | 85           |
| 50V   | 86  |       |    |  | 3.878   | (2:5)+   | 86           |
| 50V   | 87  |       |    |  | 3.914   | (2:5)+   | 87           |
| 50V   | 88  |       |    |  | 3.940   | (1:4)    | 88           |
| 50V   | 89  |       |    |  | 3.963   | (2:5)+   | 89           |
| 50V   | 90  |       |    |  | 4.040   | (1:6)-   | 90           |
| ----- |     |       |    |  |         |          |              |
| 50V   | 91  |       |    |  | 4.073   | (2:5)+   | 91           |
| 50V   | 92  |       |    |  | 4.095   |          | 92           |
| 50V   | 93  |       |    |  | 4.120   | (0:7)+   | 93           |
| 50V   | 94  |       |    |  | 4.146   | 2+,3+    | 94           |
| 50V   | 95  |       |    |  | 4.195   |          | 95           |
| 50V   | 96  |       |    |  | 4.213   |          | 96           |
| 50V   | 97  |       |    |  | 4.234   |          | 97           |
| 50V   | 98  |       |    |  | 4.262   | 2+,3+    | 98           |
| 50V   | 99  |       |    |  | 4.292   | (11+)    | 99 0.24 PS 7 |
| 50V   | 100 |       |    |  | 4.294   |          | 100          |
| ----- |     |       |    |  |         |          |              |
| 50V   | 101 |       |    |  | 4.334   | (1:6)-   | 101          |
| 50V   | 102 |       |    |  | 4.361   | (2:5)+   | 102          |
| 50V   | 103 |       |    |  | 4.396   | (2:5)+   | 103          |
| 50V   | 104 |       |    |  | 4.430   | (2:5)+   | 104          |
| 50V   | 105 | 4.431 | 1+ |  |         |          | 105          |
| 50V   | 106 |       |    |  | 4.480   | (1:6)-   | 106          |
| 50V   | 107 |       |    |  | 4.501   | (1:6)-   | 107          |
| 50V   | 108 |       |    |  | 4.541   |          | 108          |
| 50V   | 109 |       |    |  | 4.570   | 3-,4-    | 109          |
| 50V   | 110 |       |    |  | 4.599   | (2,3)+   | 110          |
| ----- |     |       |    |  |         |          |              |
| 50V   | 111 |       |    |  | 4.653   | (2:5)+   | 111          |
| 50V   | 112 |       |    |  | 4.704   | (1:6)-   | 112          |
| 50V   | 113 | 4.722 | 1+ |  |         |          | 113          |
| 50V   | 114 |       |    |  | 4.774   | (1:6)    | 114          |
| 50V   | 115 |       |    |  | 4.815 3 | (0)+     | 115          |
| 50V   | 116 |       |    |  | 4.833   | (2:5)+   | 116          |
| 50V   | 117 |       |    |  | 4.864   |          | 117          |
| 50V   | 118 |       |    |  | 4.904   | 1+,2+,3+ | 118          |
| 50V   | 119 |       |    |  | 4.935   | 1+,2+,3+ | 119          |
| 50V   | 120 |       |    |  | 5.026   |          | 120          |
| ----- |     |       |    |  |         |          |              |
| 50V   | 121 |       |    |  | 5.060   | (2:5)+   | 121          |
| 50V   | 122 |       |    |  | 5.107   | (2:5)+   | 122          |
| 50V   | 123 | 5.172 | 1+ |  |         |          | 123          |
| 50V   | 124 |       |    |  | 5.264   |          | 124          |
| 50V   | 125 |       |    |  | 5.288   |          | 125          |
| 50V   | 126 |       |    |  | 5.320   |          | 126          |
| 50V   | 127 |       |    |  | 5.352   |          | 127          |

|         |  |       |          |       |  |       |            |     |  |
|---------|--|-------|----------|-------|--|-------|------------|-----|--|
| 50V 128 |  |       |          |       |  | 5.405 |            | 128 |  |
| 50V 129 |  |       |          |       |  | 5.440 | (2:5)+     | 129 |  |
| 50V 130 |  | 5.491 | 1+       |       |  |       |            | 130 |  |
| -----   |  |       |          |       |  |       |            |     |  |
| 50V 131 |  |       |          |       |  | 5.543 | 1+,2+,3+   | 131 |  |
| 50V 132 |  |       |          |       |  | 5.664 |            | 132 |  |
| 50V 133 |  | 5.753 | 1+       |       |  |       |            | 133 |  |
| 50V 134 |  |       |          |       |  | 5.782 | 1+,2+,3+   | 134 |  |
| 50V 135 |  |       |          |       |  | 5.829 |            | 135 |  |
| 50V 136 |  |       |          |       |  | 5.871 |            | 136 |  |
| 50V 137 |  |       |          |       |  | 5.896 |            | 137 |  |
| 50V 138 |  |       |          |       |  | 5.948 | 2+,3+      | 138 |  |
| 50V 139 |  |       |          |       |  | 6.080 |            | 139 |  |
| 50V 140 |  |       |          |       |  | 6.124 |            | 140 |  |
| -----   |  |       |          |       |  |       |            |     |  |
| 50V 141 |  |       |          |       |  | 6.179 | (1+,2+,3+) | 141 |  |
| 50V 142 |  |       |          |       |  | 6.222 |            | 142 |  |
| 50V 143 |  |       |          |       |  | 6.267 | (1+,2+,3+) | 143 |  |
| 50V 144 |  |       |          |       |  | 6.341 |            | 144 |  |
| 50V 145 |  |       |          |       |  | 6.390 | (2)+       | 145 |  |
| 50V 146 |  |       |          |       |  | 6.464 |            | 146 |  |
| 50V 147 |  |       |          |       |  | 6.558 |            | 147 |  |
| 50V 148 |  |       |          |       |  | 6.601 |            | 148 |  |
| 50V 149 |  |       |          |       |  | 6.652 |            | 149 |  |
| 50V 150 |  |       |          |       |  | 6.685 |            | 150 |  |
| -----   |  |       |          |       |  |       |            |     |  |
| 50V 151 |  |       |          |       |  | 6.744 |            | 151 |  |
| 50V 152 |  |       |          |       |  | 6.804 |            | 152 |  |
| 50V 153 |  |       |          |       |  | 6.833 |            | 153 |  |
| 50V 154 |  |       |          |       |  | 6.883 |            | 154 |  |
| 50V 155 |  |       |          |       |  | 6.929 |            | 155 |  |
| 50V 156 |  |       |          |       |  | 6.969 |            | 156 |  |
| 50V 157 |  |       |          |       |  | 6.989 |            | 157 |  |
| 50V 158 |  |       |          |       |  | 7.092 |            | 158 |  |
| 50V 159 |  |       |          |       |  | 7.106 |            | 159 |  |
| 50V 160 |  |       |          |       |  | 7.173 |            | 160 |  |
| -----   |  |       |          |       |  |       |            |     |  |
| 50V 161 |  |       |          |       |  | 7.206 |            | 161 |  |
| 50V 162 |  |       |          |       |  | 7.321 |            | 162 |  |
| 50V 163 |  |       |          |       |  | 7.386 |            | 163 |  |
| 50V 164 |  |       |          |       |  | 7.442 |            | 164 |  |
| 50V 165 |  |       |          |       |  | 7.520 | (4)+       | 165 |  |
| S-p =   |  | 7.948 | ( 0.000) | ----- |  |       |            |     |  |
| 50V 166 |  |       |          |       |  | 8.050 | (6)+       | 166 |  |
| 50V 167 |  |       |          |       |  | 8.590 | (0)+       | 167 |  |
| 50V 168 |  |       |          |       |  | 8.768 |            | 168 |  |
| 50V 169 |  |       |          |       |  | 8.812 |            | 169 |  |
| 50V 170 |  |       |          |       |  | 8.814 |            | 170 |  |
| -----   |  |       |          |       |  |       |            |     |  |
| 50V 171 |  |       |          |       |  | 8.840 |            | 171 |  |

|         |  |  |       |     |
|---------|--|--|-------|-----|
| 50V 172 |  |  | 8.842 | 172 |
| 50V 173 |  |  | 8.848 | 173 |
| 50V 174 |  |  | 8.855 | 174 |
| 50V 175 |  |  | 8.864 | 175 |
| 50V 176 |  |  | 8.870 | 176 |
| 50V 177 |  |  | 8.876 | 177 |
| 50V 178 |  |  | 8.879 | 178 |
| 50V 179 |  |  | 8.883 | 179 |
| 50V 180 |  |  | 8.890 | 180 |
| -----   |  |  |       |     |
| 50V 181 |  |  | 8.893 | 181 |
| 50V 182 |  |  | 8.895 | 182 |
| 50V 183 |  |  | 8.896 | 183 |
| 50V 184 |  |  | 8.899 | 184 |
| 50V 185 |  |  | 8.904 | 185 |
| 50V 186 |  |  | 8.906 | 186 |
| 50V 187 |  |  | 8.908 | 187 |
| 50V 188 |  |  | 8.911 | 188 |
| 50V 189 |  |  | 8.915 | 189 |
| 50V 190 |  |  | 8.918 | 190 |
| -----   |  |  |       |     |
| 50V 191 |  |  | 8.921 | 191 |
| 50V 192 |  |  | 8.923 | 192 |
| 50V 193 |  |  | 8.926 | 193 |
| 50V 194 |  |  | 8.934 | 194 |
| 50V 195 |  |  | 8.938 | 195 |
| 50V 196 |  |  | 8.942 | 196 |
| 50V 197 |  |  | 8.950 | 197 |
| 50V 198 |  |  | 8.958 | 198 |
| 50V 199 |  |  | 8.959 | 199 |
| 50V 200 |  |  | 8.964 | 200 |
| -----   |  |  |       |     |
| 50V 201 |  |  | 8.966 | 201 |
| 50V 202 |  |  | 8.968 | 202 |
| 50V 203 |  |  | 8.973 | 203 |
| 50V 204 |  |  | 8.976 | 204 |
| 50V 205 |  |  | 8.987 | 205 |
| 50V 206 |  |  | 8.990 | 206 |
| 50V 207 |  |  | 8.993 | 207 |
| 50V 208 |  |  | 8.996 | 208 |
| 50V 209 |  |  | 9.004 | 209 |
| 50V 210 |  |  | 9.012 | 210 |
| -----   |  |  |       |     |
| 50V 211 |  |  | 9.014 | 211 |
| 50V 212 |  |  | 9.017 | 212 |
| 50V 213 |  |  | 9.018 | 213 |
| 50V 214 |  |  | 9.022 | 214 |
| 50V 215 |  |  | 9.025 | 215 |
| 50V 216 |  |  | 9.027 | 216 |
| 50V 217 |  |  | 9.029 | 217 |

|         |  |  |  |       |     |
|---------|--|--|--|-------|-----|
| 50V 218 |  |  |  | 9.032 | 218 |
| 50V 219 |  |  |  | 9.035 | 219 |
| 50V 220 |  |  |  | 9.038 | 220 |
| -----   |  |  |  |       |     |
| 50V 221 |  |  |  | 9.039 | 221 |
| 50V 222 |  |  |  | 9.042 | 222 |
| 50V 223 |  |  |  | 9.046 | 223 |
| 50V 224 |  |  |  | 9.051 | 224 |
| 50V 225 |  |  |  | 9.053 | 225 |
| 50V 226 |  |  |  | 9.057 | 226 |
| 50V 227 |  |  |  | 9.062 | 227 |
| 50V 228 |  |  |  | 9.065 | 228 |
| 50V 229 |  |  |  | 9.070 | 229 |
| 50V 230 |  |  |  | 9.073 | 230 |
| -----   |  |  |  |       |     |
| 50V 231 |  |  |  | 9.076 | 231 |
| 50V 232 |  |  |  | 9.081 | 232 |
| 50V 233 |  |  |  | 9.084 | 233 |
| 50V 234 |  |  |  | 9.087 | 234 |
| 50V 235 |  |  |  | 9.089 | 235 |
| 50V 236 |  |  |  | 9.092 | 236 |
| 50V 237 |  |  |  | 9.097 | 237 |
| 50V 238 |  |  |  | 9.100 | 238 |
| 50V 239 |  |  |  | 9.104 | 239 |
| 50V 240 |  |  |  | 9.107 | 240 |
| -----   |  |  |  |       |     |
| 50V 241 |  |  |  | 9.110 | 241 |
| 50V 242 |  |  |  | 9.112 | 242 |
| 50V 243 |  |  |  | 9.115 | 243 |
| 50V 244 |  |  |  | 9.116 | 244 |
| 50V 245 |  |  |  | 9.119 | 245 |
| 50V 246 |  |  |  | 9.126 | 246 |
| 50V 247 |  |  |  | 9.128 | 247 |
| 50V 248 |  |  |  | 9.131 | 248 |
| 50V 249 |  |  |  | 9.134 | 249 |
| 50V 250 |  |  |  | 9.141 | 250 |
| -----   |  |  |  |       |     |
| 50V 251 |  |  |  | 9.145 | 251 |
| 50V 252 |  |  |  | 9.148 | 252 |
| 50V 253 |  |  |  | 9.151 | 253 |
| 50V 254 |  |  |  | 9.154 | 254 |
| 50V 255 |  |  |  | 9.158 | 255 |
| 50V 256 |  |  |  | 9.162 | 256 |
| 50V 257 |  |  |  | 9.164 | 257 |
| 50V 258 |  |  |  | 9.164 | 258 |
| 50V 259 |  |  |  | 9.166 | 259 |
| 50V 260 |  |  |  | 9.168 | 260 |
| -----   |  |  |  |       |     |
| 50V 261 |  |  |  | 9.174 | 261 |
| 50V 262 |  |  |  | 9.175 | 262 |

|           |   |         |          |       |      |     |
|-----------|---|---------|----------|-------|------|-----|
| 50V 263   |   |         |          | 9.178 |      | 263 |
| 50V 264   |   |         |          | 9.180 |      | 264 |
| 50V 265   |   |         |          | 9.182 |      | 265 |
| 50V 266   |   |         |          | 9.188 |      | 266 |
| 50V 267   |   |         |          | 9.192 |      | 267 |
| 50V 268   |   |         |          | 9.197 |      | 268 |
| 50V 269   |   |         |          | 9.199 |      | 269 |
| 50V 270   |   |         |          | 9.203 |      | 270 |
| -----     |   |         |          |       |      |     |
| 50V 271   |   |         |          | 9.207 |      | 271 |
| 50V 272   |   |         |          | 9.255 |      | 272 |
| 50V 273   |   |         |          | 9.270 | (3)- | 273 |
| 50V 274   |   |         |          | 9.304 |      | 274 |
| S-n       | = | 9.332   | ( 0.001) | ----- |      |     |
| 50V 275   |   |         |          | 9.451 |      | 275 |
| 50V 276   |   |         |          | 9.499 |      | 276 |
| 50V 277   |   |         |          | 9.529 |      | 277 |
| 50V 278   |   |         |          | 9.548 |      | 278 |
| 50V 279   |   |         |          | 9.646 |      | 279 |
| 50V 280   |   |         |          | 9.743 |      | 280 |
| -----     |   |         |          |       |      |     |
| 50V 281   |   |         |          | 9.841 |      | 281 |
|           |   |         |          |       |      |     |
| S-p       | = | 7.948   | ( 0.000) | ----- |      |     |
| S-n       | = | 9.332   | ( 0.001) | ----- |      |     |
| S-2p      | = | 19.297  | ( 0.005) | ----- |      |     |
| S-2n      | = | 20.888  | ( 0.001) | ----- |      |     |
| S-alpha   | = | 9.886   | ( 0.001) | ----- |      |     |
|           |   |         |          |       |      |     |
| S+p       | = | -9.516  | ( 0.000) |       |      |     |
| S+n       | = | -11.051 | ( 0.000) |       |      |     |
| S+2p      | = | -16.066 | ( 0.000) |       |      |     |
| S+2n      | = | -18.362 | ( 0.000) |       |      |     |
| S+alpha   | = | -8.760  | ( 0.001) |       |      |     |
|           |   |         |          |       |      |     |
| gap p     | = | -1.568  | ( 0.000) |       |      |     |
| gap n     | = | -1.719  | ( 0.001) |       |      |     |
| gap 2p    | = | 3.231   | ( 0.005) |       |      |     |
| gap 2n    | = | 2.525   | ( 0.001) |       |      |     |
| gap alpha | = | 1.127   | ( 0.001) |       |      |     |