# Measured Level Energies, B(E2)-Values and Half-Lifes

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2 barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{6}$He | 1797. 25 | | | |
| $^{8}$He | 2600. 200 | | | |
| | | | | |
| $^{6}$Be | 1670. 50 | | | |
| $^{8}$Be | 3040. 30 | | | |
| $^{10}$Be | 3368.03 3 | 0.0052 5 | 0.125 12 | |
| $^{12}$Be | 2102. 12 | | | |
| | | | | |
| $^{10}$C | 3353.6 7 | 0.0062 9 | 0.107 17 | |
| $^{12}$C | 4438.91 31 | 0.0041 5 | | |
| $^{14}$C | 7012. 4 | 0.0019 2 | 0.0090 14 | |
| $^{16}$C | 1766. 10 | | | |
| $^{18}$C | 1620. 20 | | | |
| | | | | |
| $^{14}$O | 6590. 10 | | | |
| $^{16}$O | 6917.1 6 | 0.0038 1 | 0.00470 13 | |
| $^{18}$O | 1982.07 9 | 0.0048 1 | 1.94 5 | |
| $^{20}$O | 1673.68 15 | 0.0030 1 | 7.3 3 | |
| $^{22}$O | 3199. 8 | | | |
| | | | | |
| $^{16}$Ne | 1690. 70 | | | |
| $^{18}$Ne | 1887.3 2 | 0.026 2 | 0.46 4 | |
| $^{20}$Ne | 1633.67 2 | 0.033 2 | 0.73 4 | |
| $^{22}$Ne | 1274.54 7 | 0.023 1 | 3.67 14 | |
| $^{24}$Ne | 1981.6 4 | 0.014 3 | 0.66 15 | |
| $^{26}$Ne | 2018.2 1 | | | |
| $^{28}$Ne | 1320. 20 | 0.027 14 | 2.6 1.3 | |
| $^{30}$Ne | 791. 26 | 0.046 27 | 20 +37 -9 | |
| | | | | |
| $^{22}$Mg | 1246.0 5 | 0.045 12 | 2.1 8 | |
| $^{24}$Mg | 1368.68 6 | 0.0436 9 | 1.35 3 | 0.000013 |
| $^{26}$Mg | 1808.72 7 | 0.0307 8 | 0.476 12 | |
| $^{28}$Mg | 1473.4 6 | 0.034 3 | 1.2 1 | |
| $^{30}$Mg | 1482.2 4 | | | |
| $^{32}$Mg | 885.3 1 | 0.047 8 | 11.4 20 | |

Table 1: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ ($e^2barn^2$) | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{26}$Si | 1795.9 2 | 0.0352 30 | 0.43 4 | |
| $^{28}$Si | 1779.03 1 | 0.0334 6 | 0.475 9 | |
| $^{30}$Si | 2235.33 3 | 0.0204 9 | 0.248 12 | |
| $^{32}$Si | 1941.4 3 | 0.0160 45 | 0.63 17 | |
| $^{34}$Si | 3327.7 5 | 0.0085 33 | 0.082 32 | |
| $^{36}$Si | 1399. 25 | 0.0195 59 | 2.7 8 | |
| $^{38}$Si | 1084. 20 | 0.019 7 | 10 4 | |
| $^{40}$Si | 986. 5 | | | |
| $^{42}$Si | 770. 15 | | | |
| | | | | |
| $^{30}$S | 2210.6 5 | 0.031 2 | 0.175 15 | |
| $^{32}$S | 2230.2 2 | 0.0305 9 | 0.168 5 | |
| $^{34}$S | 2127.56 1 | 0.0200 5 | 0.325 9 | |
| $^{36}$S | 3290.9 3 | 0.010 2 | 0.075 20 | |
| $^{38}$S | 1292.0 2 | 0.0238 31 | 3.3 5 | |
| $^{40}$S | 903.69 7 | 0.0334 36 | 15.9 21 | |
| $^{42}$S | 890. 15 | 0.0397 63 | 12.8 23 | |
| $^{44}$S | 1297. 18 | 0.031 9 | 2.4 7 | |
| | | | | |
| $^{34}$Ar | 2090.9 3 | 0.022 3 | 0.32 4 | |
| $^{36}$Ar | 1970.39 5 | 0.034 4 | 0.32 3 | |
| $^{38}$Ar | 2167.47 1 | 0.0126 5 | 0.47 2 | |
| $^{40}$Ar | 1460.86 1 | 0.0380 13 | 1.12 4 | |
| $^{42}$Ar | 1208.2 3 | 0.042 8 | 2.6 6 | |
| $^{44}$Ar | 1158.0 1 | 0.0294 40 | 4.9 7 | |
| $^{46}$Ar | 1577. 1 | 0.0196 39 | 1.59 32 | |
| | | | | |
| $^{38}$Ca | 2206. 5 | 0.078 34 | | |
| $^{40}$Ca | 3904.38 3 | 0.0092 5 | 0.034 2 | |
| $^{42}$Ca | 1524.72 3 | 0.0419 10 | 0.82 2 | |
| $^{44}$Ca | 1157.05 2 | 0.052 3 | 2.61 14 | 0.0000648 |
| $^{46}$Ca | 1346.0 3 | 0.0178 14 | 3.6 3 | |
| $^{48}$Ca | 3831.72 6 | 0.0082 5 | 0.0418 26 | |
| $^{50}$Ca | 1026. 1 | | | |
| $^{52}$Ca | 2563. 1 | | | |
| | | | | |
| $^{42}$Ti | 1556.0 8 | 0.078 12 | 0.400 75 | |
| $^{44}$Ti | 1082.99 9 | 0.061 13 | 3.1 8 | |
| $^{46}$Ti | 889.29 1 | 0.100 7 | 5.1 4 | 0.00017 |
| $^{48}$Ti | 983.52 1 | 0.072 4 | 4.27 24 | |
| $^{50}$Ti | 1553.78 1 | 0.029 4 | 1.07 15 | |
| $^{52}$Ti | 1049.73 10 | 0.067 $^{56}_{42}$ | 3.3 $^{56}_{15}$ | |
| $^{54}$Ti | 1494.8 8 | 0.0357 63 | 0.9 2 | |
| | | | | |
| $^{48}$Cr | 752.16 12 | 0.160 16 | 7.3 8 | |
| $^{50}$Cr | 783.30 9 | 0.108 6 | 8.87 49 | |
| $^{52}$Cr | 1434.06 3 | 0.066 3 | 0.71 3 | |
| $^{54}$Cr | 834.86 1 | 0.088 3 | 7.9 3 | 0.00024 |
| $^{56}$Cr | 1006.61 2 | 0.055 19 | | |
| $^{58}$Cr | 880. | 0.099 28 | | |

Table 2: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{50}$Fe | 765.0 10 | | | |
| $^{52}$Fe | 849.5 7 | | | |
| $^{54}$Fe | 1408.19 19 | 0.064 2 | 0.80 3 | |
| $^{56}$Fe | 846.76 2 | 0.107 4 | 6.07 23 | |
| $^{58}$Fe | 810.78 1 | 0.123 4 | 6.54 19 | 0.00034 |
| $^{60}$Fe | 823.63 15 | 0.093 15 | 8.0 15 | |
| $^{62}$Fe | 876.8 3 | | | |
| | | | | |
| $^{54}$Ni | 1396. 9 | 0.063 17 | 0.85 23 | |
| $^{56}$Ni | 2700.6 7 | 0.037 $^{18}_{15}$ | 0.053 $^{34}_{17}$ | |
| $^{58}$Ni | 1454.45 15 | 0.065 3 | 0.667 28 | |
| $^{60}$Ni | 1332.52 1 | 0.094 1 | 0.713 11 | 0.000133 |
| $^{62}$Ni | 1172.91 9 | 0.088 1 | 1.45 2 | |
| $^{64}$Ni | 1345.75 5 | 0.073 2 | 0.88 3 | |
| $^{66}$Ni | 1424.8 10 | | | |
| $^{68}$Ni | 2034.07 17 | 2.55 60 | 0.0032 8 | |
| $^{70}$Ni | 1259.6 2 | | | |
| | | | | |
| $^{60}$Zn | 1004.1 5 | | | |
| $^{62}$Zn | 954.0 4 | 0.123 8 | 2.91 21 | |
| $^{64}$Zn | 991.52 10 | 0.164 4 | 1.80 4 | |
| $^{66}$Zn | 1039.24 1 | 0.141 5 | 1.65 6 | |
| $^{68}$Zn | 1077.37 4 | 0.129 5 | 1.51 6 | |
| $^{70}$Zn | 884.8 1 | 0.180 17 | 2.9 3 | |
| $^{72}$Zn | 652.5 3 | | | |
| $^{74}$Zn | 605.82 5 | | | |
| $^{76}$Zn | 598.68 10 | | | |
| | | | | |
| $^{64}$Ge | 901.7 3 | | | |
| $^{66}$Ge | 957.00 9 | 0.095 15 | 3.7 7 | |
| $^{68}$Ge | 1015.99 8 | 0.145 15 | 1.8 2 | |
| $^{70}$Ge | 1039.25 6 | 0.180 3 | 1.30 2 | |
| $^{72}$Ge | 834.01 2 | 0.209 3 | 3.35 5 | |
| $^{74}$Ge | 595.85 6 | 0.304 3 | 12.37 12 | |
| $^{76}$Ge | 562.92 3 | 0.275 3 | 18.2 2 | |
| $^{78}$Ge | 619.34 13 | | | |
| $^{80}$Ge | 659.15 4 | | | |
| $^{82}$Ge | 1348.04 6 | | | |
| | | | | |
| $^{68}$Se | 854.2 3 | | | |
| $^{70}$Se | 945.4 3 | 0.37 6 | 1.0 2 | |
| $^{72}$Se | 862.08 9 | 0.20 2 | 3.0 3 | |
| $^{74}$Se | 634.75 7 | 0.388 5 | 7.08 9 | |
| $^{76}$Se | 559.10 1 | 0.421 7 | 12.3 2 | |
| $^{78}$Se | 613.73 1 | 0.335 10 | 9.7 3 | |
| $^{80}$Se | 666.16 8 | 0.252 4 | 8.56 14 | |
| $^{82}$Se | 654.69 2 | 0.180 3 | 13.1 2 | |
| $^{84}$Se | 1454.42 9 | | | |
| $^{86}$Se | 704. 1 | | | |

Table 3: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ ($e^2barn^2$) | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{72}$Kr | 709.1 3 | | | |
| $^{74}$Kr | 455.80 10 | 0.88 7 | 16.3 14 | |
| $^{76}$Kr | 423.96 7 | 0.83 2 | 24.9 7 | |
| $^{78}$Kr | 455.04 3 | 0.61 3 | 23.9 13 | |
| $^{80}$Kr | 616.61 9 | 0.36 2 | 8.7 5 | |
| $^{82}$Kr | 776.52 1 | 0.225 9 | 4.45 18 | |
| $^{84}$Kr | 881.62 1 | 0.122 5 | 4.35 18 | |
| $^{86}$Kr | 1564.87 9 | 0.135 10 | 0.222 18 | |
| $^{88}$Kr | 775.31 4 | | | |
| $^{90}$Kr | 707.13 5 | | | |
| $^{92}$Kr | 769.1 5 | | | |
| $^{94}$Kr | 665.5 | | | |
| | | | | |
| $^{76}$Sr | 260.9 2 | | | |
| $^{78}$Sr | 278. 2 | 1.10 12 | 155. 19 | |
| $^{80}$Sr | 385.86 4 | 0.94 3 | 35.0 13 | |
| $^{82}$Sr | 573.54 8 | 0.51 2 | 8.9 4 | |
| $^{84}$Sr | 793.30 9 | 0.170 $^{6}_{4}$ | 5.3 $^{17}_{13}$ | 0.00103 |
| $^{86}$Sr | 1076.68 4 | 0.121 4 | 1.61 6 | |
| $^{88}$Sr | 1836.09 1 | 0.084 3 | 0.162 5 | |
| $^{90}$Sr | 831.68 4 | 0.10 2 | 7. 2 | 0.00091 |
| $^{92}$Sr | 814.98 4 | 0.10 3 | 8. 3 | |
| $^{94}$Sr | 836.91 10 | 0.10 3 | 6.9 28 | |
| $^{96}$Sr | 814.93 8 | 0.16 6 | 4.8 28 | |
| $^{98}$Sr | 144.23 1 | 1.29 4 | 2780. 80 | 0.264 |
| $^{100}$Sr | 129.7 5 | 1.41 6 | 3910. 160 | 0.40 |
| $^{102}$Sr | 126.0 2 | 2.1 6 | 3000 1200 | |
| | | | | |
| $^{80}$Zr | 288.9 2 | | | |
| $^{82}$Zr | 407.3 2 | | | |
| $^{84}$Zr | 540.0 3 | 0.44 2 | 14.1 8 | |
| $^{86}$Zr | 751.75 3 | 0.16 3 | 7.3 14 | |
| $^{88}$Zr | 1057.03 4 | 0.27 7 | 0.8 3 | |
| $^{90}$Zr | 2186.27 2 | 0.064 2 | 0.088 3 | 0.00696 |
| $^{92}$Zr | 934.49 5 | 0.079 6 | 5.0 4 | 0.00079 |
| $^{94}$Zr | 918.75 5 | 0.056 5 | 7.7 8 | |
| $^{96}$Zr | 1750.50 2 | 0.056 $^{23}_{117}$ | 0.31 $^{21}_{9}$ | |
| $^{98}$Zr | 1222.9 1 | | | |
| $^{100}$Zr | 212.53 1 | 1.13 4 | 540. 20 | 0.073 |
| $^{102}$Zr | 151.78 11 | 1.48 17 | 1910. 250 | 0.243 |
| $^{104}$Zr | 140.3 10 | | | |

Table 4: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{84}$Mo | 443.8 3 | | | |
| $^{86}$Mo | 566.6 4 | | | |
| $^{88}$Mo | 740.53 5 | 0.179 5 | 7.1 2 | |
| $^{90}$Mo | 947.97 9 | | | |
| $^{92}$Mo | 1509.49 3 | 0.103 6 | 0.35 2 | |
| $^{94}$Mo | 871.10 2 | 0.196 3 | 2.88 4 | |
| $^{96}$Mo | 778.25 1 | 0.270 4 | 3.67 6 | 0.00143 |
| $^{98}$Mo | 787.38 1 | 0.268 5 | 3.49 6 | |
| $^{100}$Mo | 535.57 3 | 0.510 8 | 12.6 2 | |
| $^{102}$Mo | 296.61 1 | 0.96 3 | 125. 4 | 0.0257 |
| $^{104}$Mo | 192.3 2 | 1.33 7 | 721. 41 | 0.12 |
| $^{106}$Mo | 171.55 1 | 1.30 3 | 1250. 30 | 0.1748 |
| $^{108}$Mo | 192.7 2 | 1.84 69 | 500. 300 | 0.155 |
| | | | | |
| $^{88}$Ru | 616.2 5 | | | |
| $^{90}$Ru | 738.00 10 | | | |
| $^{92}$Ru | 864.6 10 | | | |
| $^{94}$Ru | 1430.51 2 | | | |
| $^{96}$Ru | 832.57 5 | 0.251 10 | 2.81 11 | 0.00137 |
| $^{98}$Ru | 652.44 4 | 0.373 7 | 6.42 12 | |
| $^{100}$Ru | 539.51 1 | 0.492 6 | 12.53 15 | 0.0043 |
| $^{102}$Ru | 475.08 2 | 0.639 7 | 18.3 2 | |
| $^{104}$Ru | 358.02 7 | 0.840 15 | 56.4 10 | 0.01502 |
| $^{106}$Ru | 270.07 4 | | | |
| $^{108}$Ru | 242.24 7 | 0.89 7 | 360. 30 | 0.056 |
| $^{110}$Ru | 240.71 10 | 1.10 7 | 300. 20 | |
| $^{112}$Ru | 236.7 2 | 1.13 10 | 320. 30 | |
| | | | | |
| $^{94}$Pd | 813.8 1 | | | |
| $^{96}$Pd | 1415.4 3 | | | |
| $^{98}$Pd | 863.1 3 | | | |
| $^{100}$Pd | 665.56 2 | | | |
| $^{102}$Pd | 556.43 4 | 0.46 3 | 11.5 8 | 0.00447 |
| $^{104}$Pd | 555.81 4 | 0.54 3 | 9.9 5 | 0.0045 |
| $^{106}$Pd | 511.85 2 | 0.67 2 | 12.1 3 | |
| $^{108}$Pd | 433.94 1 | 0.76 2 | 23.9 7 | 0.0091 |
| $^{110}$Pd | 373.81 6 | 0.90 6 | 43. 3 | |
| $^{112}$Pd | 348.8 2 | 0.65 9 | 84. 14 | |
| $^{114}$Pd | 332.5 2 | 0.34 8 | 200. 60 | 0.02113 |
| $^{116}$Pd | 340.6 3 | 0.55 12 | 110. 30. | 0.0196 |
| $^{118}$Pd | 378.6 1 | | | |

Table 5: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ ($e^2barn^2$) | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{98}$Cd | 1394.7 3 | | | |
| $^{100}$Cd | 1004.5 3 | | | |
| $^{102}$Cd | 776.55 14 | | | |
| $^{104}$Cd | 658.0 2 | | | |
| $^{106}$Cd | 632.64 4 | 0.383 4 | 7.27 8 | 0.0030 |
| $^{108}$Cd | 632.99 2 | 0.406 4 | 6.86 7 | |
| $^{110}$Cd | 657.76 1 | 0.425 5 | 5.39 7 | 0.00318 |
| $^{112}$Cd | 617.52 1 | 0.484 4 | 6.51 6 | |
| $^{114}$Cd | 558.46 1 | 0.51 3 | 10.2 6 | |
| $^{116}$Cd | 513.49 2 | 0.56 2 | 14.1 5 | |
| $^{118}$Cd | 487.77 8 | 0.57 4 | 17.9 15 | |
| $^{120}$Cd | 505.9 2 | | | |
| $^{122}$Cd | 569.45 8 | | | |
| $^{124}$Cd | 613.3 2 | | | |
| $^{126}$Cd | 652.0 9 | | | |
| $^{128}$Cd | 645. | | | |
| | | | | |
| $^{102}$Sn | 1472. | | | |
| $^{104}$Sn | 1260.1 3 | | | |
| $^{106}$Sn | 1206. 1 | | | |
| $^{108}$Sn | 1206.07 10 | | | |
| $^{110}$Sn | 1211.9 2 | | | |
| $^{112}$Sn | 1256.85 7 | 0.244 13 | 0.37 2 | |
| $^{114}$Sn | 1299.92 7 | 0.25 4 | 0.30 6 | |
| $^{116}$Sn | 1293.56 1 | 0.209 5 | 0.374 10 | 0.00075 |
| $^{118}$Sn | 1229.67 2 | 0.207 8 | 0.485 19 | |
| $^{120}$Sn | 1171.3 2 | 0.200 3 | 0.642 10 | |
| $^{122}$Sn | 1140.55 3 | 0.193 10 | 0.76 4 | |
| $^{124}$Sn | 1131.74 2 | 0.166 5 | 0.92 3 | 0.00099 |
| $^{126}$Sn | 1141.15 4 | | | |
| $^{128}$Sn | 1168.82 4 | | | |
| $^{130}$Sn | 1221.26 5 | | | |
| $^{132}$Sn | 4041.1 4 | | | |
| $^{134}$Sn | 725.6 | | | |
| | | | | |
| $^{108}$Te | 625.4 5 | | | |
| $^{110}$Te | 656. 1 | | | |
| $^{112}$Te | 689.0 2 | | | |
| $^{114}$Te | 708.9 2 | | | |
| $^{116}$Te | 678.92 3 | | | |
| $^{118}$Te | 605.71 2 | | | |
| $^{120}$Te | 560.44 2 | 0.55 9 | 9.3 19 | |
| $^{122}$Te | 564.12 1 | 0.663 4 | 7.42 5 | 0.00591 |
| $^{124}$Te | 602.73 1 | 0.574 9 | 6.2 1 | |
| $^{126}$Te | 666.34 1 | 0.475 12 | 4.52 12 | 0.00380 |
| $^{128}$Te | 743.22 1 | 0.375 3 | 3.32 3 | 0.00291 |
| $^{130}$Te | 839.49 2 | 0.294 5 | 2.30 4 | 0.00217 |
| $^{132}$Te | 973.9 1 | | | |
| $^{134}$Te | 1279.0 1 | | | |
| $^{136}$Te | 605.9 1 | | | |

Table 6: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{114}$Xe | 449.7 2 | | | |
| $^{116}$Xe | 393.5 2 | | | |
| $^{118}$Xe | 337.3 1 | 1.40 6 | 45. 2 | 0.0289 |
| $^{120}$Xe | 322.4 1 | 0.92 7 | 85. 7 | 0.033 |
| $^{122}$Xe | 331.2 2 | 1.11 10 | 62. 6 | 0.0307 |
| $^{124}$Xe | 354.14 4 | 1.50 9 | 33. 2 | 0.0248 |
| $^{126}$Xe | 388.63 1 | 0.76 2 | 41.3 14 | 0.01793 |
| $^{128}$Xe | 442.91 1 | 0.77 4 | 21.3 11 | 0.0127 |
| $^{130}$Xe | 536.09 2 | 0.74 8 | 8.6 10 | 0.00748 |
| $^{132}$Xe | 667.72 1 | 0.45 2 | 4.7 2 | 0.00421 |
| $^{134}$Xe | 847.04 2 | 0.34 6 | 1.9 4 | 0.00237 |
| $^{136}$Xe | 1313.03 1 | 0.18 5 | 0.41 18 | |
| $^{138}$Xe | 588.83 2 | 0.0236 25 | 169. 20 | |
| $^{140}$Xe | 376.66 2 | 0.330 14 | 113. 5 | |
| $^{142}$Xe | 287.1 2 | | | |
| $^{144}$Xe | 252.6 | | | |
| | | | | |
| $^{120}$Ba | 183.0 5 | | | |
| $^{122}$Ba | 196.1 3 | 2.77 23 | 297. 27 | 0.185 |
| $^{124}$Ba | 229.9 1 | 1.34 11 | 297. 26 | 0.109 |
| $^{126}$Ba | 256.09 7 | 2.21 8 | 108. 4 | 0.0758 |
| $^{128}$Ba | 284.00 5 | 1.45 $^{9}_{4}$ | 100. $^{3}_{6}$ | 0.0541 |
| $^{130}$Ba | 357.38 8 | 1.28 12 | 37. 4 | 0.0262 |
| $^{132}$Ba | 464.59 2 | 0.86 6 | 15.1 11 | 0.01211 |
| $^{134}$Ba | 604.72 1 | 0.680 12 | 5.12 9 | 0.00599 |
| $^{136}$Ba | 818.52 1 | 0.399 3 | 1.930 15 | |
| $^{138}$Ba | 1435.82 1 | 0.241 6 | 0.192 5 | |
| $^{140}$Ba | 602.35 3 | 0.37 11 | 9.7 41 | |
| $^{142}$Ba | 359.60 1 | 0.71 2 | 65. 2 | 0.0258 |
| $^{144}$Ba | 199.33 1 | 1.09 4 | 700. 30 | 0.1760 |
| $^{146}$Ba | 181.05 5 | 1.35 5 | 860. 30 | 0.244 |
| $^{148}$Ba | 141.8 1 | | | |
| | | | | |
| $^{124}$Ce | 142. | 3.48 62 | 880. 190 | 0.601 |
| $^{126}$Ce | 169.59 3 | 2.31 12 | 658. 36 | 0.325 |
| $^{128}$Ce | 207.3 5 | 2.12 19 | 300. 30 | 0.1637 |
| $^{130}$Ce | 253.99 19 | 1.73 8 | 143. 7 | 0.0837 |
| $^{132}$Ce | 325.54 2 | 1.82 12 | 41. 3 | 0.0379 |
| $^{134}$Ce | 409.1 1 | 1.05 8 | 23. 2 | 0.01901 |
| $^{136}$Ce | 552.2 1 | | | |
| $^{138}$Ce | 788.74 1 | 0.46 3 | 2.00 15 | |
| $^{140}$Ce | 1596.23 3 | 0.36 5 | 0.076 11 | |
| $^{142}$Ce | 641.29 1 | 0.47 1 | 5.56 12 | 0.00568 |
| $^{144}$Ce | 397.44 1 | | | |
| $^{146}$Ce | 258.46 3 | 0.91 10 | 250. 30 | 0.0789 |
| $^{148}$Ce | 158.47 1 | 1.99 11 | 1010. 60 | 0.411 |
| $^{150}$Ce | 97.1 3 | 2.75 60 | 3600. 1000 | 2.305 |
| $^{152}$Ce | 81.7 | | | |

Table 7: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{128}$Nd | 133.66 7 | | | |
| $^{130}$Nd | 158. 2 | | | |
| $^{132}$Nd | 212.6 2 | 2.59 19 | 216. 17 | 0.161 |
| $^{134}$Nd | 294.3 2 | 1.90 11 | 64. 4 | 0.056 |
| $^{136}$Nd | 373.6 3 | | | |
| $^{138}$Nd | 520.1 3 | | | |
| $^{140}$Nd | 773.73 6 | | | |
| $^{142}$Nd | 1575.8 2 | 0.265 5 | 0.110 2 | |
| $^{144}$Nd | 696.51 1 | 0.55 3 | 3.12 17 | 0.00511 |
| $^{146}$Nd | 453.77 5 | 0.67 4 | 21.6 13 | 0.0154 |
| $^{148}$Nd | 301.70 2 | 1.38 2 | 78.0 12 | 0.0517 |
| $^{150}$Nd | 130.21 8 | 2.71 3 | 1492. 15 | 0.866 |
| $^{152}$Nd | 72.5 2 | 3.84 24 | 4500. 300 | 7.18 |
| $^{154}$Nd | 70.8 1 | 2.32 48 | 7700. 2000 | 7.89 |
| $^{156}$Nd | 66.9 | | | |
| | | | | |
| $^{132}$Sm | 131. | | | |
| $^{134}$Sm | 163. 2 | 4.12 36 | 420. 40 | 0.421 |
| $^{136}$Sm | 254.9 2 | 2.73 25 | 88. 9 | 0.095 |
| $^{138}$Sm | 346.9 3 | 1.65 29 | 33. 7 | 0.0363 |
| $^{140}$Sm | 530.7 1 | | | |
| $^{142}$Sm | 768.0 2 | | | |
| $^{144}$Sm | 1660.2 4 | 0.266 8 | 0.0843 25 | |
| $^{146}$Sm | 747.12 1 | | | |
| $^{148}$Sm | 550.27 2 | 0.72 1 | 7.70 15 | 0.01008 |
| $^{150}$Sm | 333.86 1 | 1.35 3 | 48.4 11 | 0.0407 |
| $^{152}$Sm | 121.78 1 | 3.48 3 | 1400. 11 | 1.17 |
| $^{154}$Sm | 81.98 2 | 4.26 6 | 3020. 40 | 4.94 |
| $^{156}$Sm | 75.89 5 | | | |
| $^{158}$Sm | 72.8 5 | | | |
| $^{160}$Sm | 70.6 | | | |
| | | | | |
| $^{138}$Gd | 220.9 2 | 2.55 23 | 211. 21 | |
| $^{140}$Gd | 328.6 3 | | | |
| $^{142}$Gd | 515.2 | | | |
| $^{144}$Gd | 742.6 5 | | | |
| $^{146}$Gd | 1971.97 22 | | | |
| $^{148}$Gd | 784.43 2 | | | |
| $^{150}$Gd | 638.05 1 | | | |
| $^{152}$Gd | 344.28 1 | 1.74 9 | 32.4 17 | 0.0399 |
| $^{154}$Gd | 123.07 1 | 3.84 2 | 1186. 5 | 1.197 |
| $^{156}$Gd | 88.97 1 | 4.66 4 | 2210. 20 | 3.93 |
| $^{158}$Gd | 79.51 1 | 5.03 6 | 2520. 30 | 6.02 |
| $^{160}$Gd | 75.26 1 | 5.16 6 | 2690. 30 | 7.44 |
| $^{162}$Gd | 71. 7 | | | |

Table 8: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{142}$Dy | 315.9 4 | | | |
| $^{144}$Dy | 492.5 3 | | | |
| $^{146}$Dy | 682.9 3 | | | |
| $^{148}$Dy | 1677.3 1 | | | |
| $^{150}$Dy | 803.4 5 | | | |
| $^{152}$Dy | 613.81 7 | 0.32 32 | 10. 5 | 0.00914 |
| $^{154}$Dy | 334.58 8 | 2.35 16 | 27.5 20 | 0.0467 |
| $^{156}$Dy | 137.83 3 | 3.71 3 | 823. 7 | 0.858 |
| $^{158}$Dy | 98.92 1 | 4.66 8 | 1660. 30 | 2.86 |
| $^{160}$Dy | 86.79 1 | 4.98 3 | 2026. 12 | 4.69 |
| $^{162}$Dy | 80.66 1 | 5.22 7 | 2200. 30 | 6.22 |
| $^{164}$Dy | 73.39 1 | 5.56 7 | 2390. 30 | 9.0 |
| $^{166}$Dy | 76.59 1 | | | |
| | | | | |
| $^{148}$Er | 646.6 3 | | | |
| $^{150}$Er | 1578.9 2 | | | |
| $^{152}$Er | 808.3 1 | | | |
| $^{154}$Er | 560.8 5 | | | |
| $^{156}$Er | 344.51 6 | 1.64 4 | 34.0 9 | 0.0460 |
| $^{158}$Er | 192.15 3 | 3.02 11 | 277. 10 | 0.290 |
| $^{160}$Er | 125.8 1 | 4.28 14 | 919. 31 | 1.28 |
| $^{162}$Er | 102.04 3 | 5.00 11 | 1360 30 | 2.76 |
| $^{164}$Er | 91.40 2 | 5.80 12 | 1470. 30 | 4.20 |
| $^{166}$Er | 80.58 1 | 5.81 9 | 1820. 30 | 6.88 |
| $^{168}$Er | 79.80 1 | 5.71 6 | 1880. 20 | 7.14 |
| $^{170}$Er | 78.59 2 | 5.81 7 | 1891. 23 | 7.59 |
| $^{172}$Er | 77.0 4 | | | |
| | | | | |
| $^{152}$Yb | 1531.4 5 | | | |
| $^{154}$Yb | 821.3 2 | | | |
| $^{156}$Yb | 536.4 1 | | | |
| $^{158}$Yb | 358.2 1 | 1.84 20 | 25. 3 | 0.044 |
| $^{160}$Yb | 243.1 1 | 2.41 13 | 121. 7 | 0.143 |
| $^{162}$Yb | 166.85 4 | 3.60 10 | 404. 12 | 0.503 |
| $^{164}$Yb | 123.36 4 | 4.53 17 | 881. 35 | 1.48 |
| $^{166}$Yb | 102.37 3 | 5.11 24 | 1240. 60 | 2.97 |
| $^{168}$Yb | 87.73 1 | 5.76 12 | 1470. 30 | 5.43 |
| $^{170}$Yb | 84.25 1 | 5.63 5 | 1605. 13 | 6.37 |
| $^{172}$Yb | 78.74 1 | 6.03 18 | 1650. 50 | 8.4 |
| $^{174}$Yb | 76.47 1 | 5.79 13 | 1790. 40 | 9.43 |
| $^{176}$Yb | 82.13 2 | 5.34 15 | 1760. 50 | 7.06 |
| $^{178}$Yb | 84. 3 | | | |

Table 9: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{154}$Hf | 1513. | | | |
| $^{156}$Hf | | | | |
| $^{158}$Hf | 610. | | | |
| $^{160}$Hf | 389.6 | | | |
| $^{162}$Hf | 285.0 3 | | | |
| $^{164}$Hf | 211.05 5 | 1.53 11 | 356. 28 | 0.243 |
| $^{166}$Hf | 158.5 3 | 3.46 15 | 497. 23 | 0.643 |
| $^{168}$Hf | 124.0 2 | 4.22 18 | 890. 40 | 1.57 |
| $^{170}$Hf | 100.8 2 | 5.07 101 | 1200. 300 | 3.47 |
| $^{172}$Hf | 95.22 4 | 4.37 3 | 1550. 10 | 4.34 |
| $^{174}$Hf | 90.99 2 | 4.40 18 | 1660. 70 | 5.21 |
| $^{176}$Hf | 88.35 2 | 5.36 15 | 1430. 40 | 5.86 |
| $^{178}$Hf | 93.18 1 | 4.74 6 | 1480. 20 | 4.74 |
| $^{180}$Hf | 93.33 1 | 4.66 6 | 1500. 20 | 4.71 |
| $^{182}$Hf | 97.79 9 | | | |
| $^{184}$Hf | 107.4 5 | | | |
| | | | | |
| $^{166}$W | 251.7 2 | | | |
| $^{168}$W | 199.3 2 | 3.21 14 | 213. 10 | 0.315 |
| $^{170}$W | 156.2 2 | 3.54 7 | 497. 10 | 0.727 |
| $^{172}$W | 123.2 1 | 4.84 36 | 740. 60 | 1.78 |
| $^{174}$W | 113.0 1 | 3.90 23 | 1140. 70 | 2.45 |
| $^{176}$W | 107.8 2 | | | |
| $^{178}$W | 106.1 2 | | | |
| $^{180}$W | 103.56 1 | 4.17 16 | 1280. 50 | 3.45 |
| $^{182}$W | 100.11 1 | 4.15 3 | 1369. 10 | 3.95 |
| $^{184}$W | 111.21 1 | 3.68 4 | 1251. 12 | 2.61 |
| $^{186}$W | 122.33 7 | 3.55 3 | 1036. 10 | 1.81 |
| $^{188}$W | 143. 2 | | | |
| | | | | |
| $^{170}$Os | 286.7 1 | | | |
| $^{172}$Os | 227.77 9 | 3.27 19 | 116. 7 | 0.218 |
| $^{174}$Os | 158.7 2 | 4.56 49 | 350. 42 | 0.760 |
| $^{176}$Os | 135.1 5 | | | |
| $^{178}$Os | 131.6 3 | | | |
| $^{180}$Os | 132.3 3 | $3.52\ ^{9}_{6}$ | $800.\ ^{21}_{14}$ | 1.48 |
| $^{182}$Os | 127.0 1 | 3.87 5 | 813. 11 | 1.72 |
| $^{184}$Os | 119.80 9 | 3.06 3 | 1184. 13 | 2.16 |
| $^{186}$Os | 137.16 1 | 2.91 5 | 875. 15 | 1.29 |
| $^{188}$Os | 155.02 1 | 2.45 7 | 710. 20 | 0.82 |
| $^{190}$Os | 186.72 1 | 2.41 4 | 363. 6 | 0.425 |
| $^{192}$Os | 205.79 1 | 2.12 3 | 277. 4 | 0.305 |
| $^{194}$Os | 218.51 1 | | | |
| $^{196}$Os | 300. 20 | | | |

Table 10: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{176}$Pt | 264.0 3 | 2.53 21 | 76. 7 | 0.147 |
| $^{178}$Pt | 170.1 10 | | | |
| $^{180}$Pt | 153.3 1 | 4.61 39 | 374. 35 | 0.936 |
| $^{182}$Pt | 154.9 1 | | | |
| $^{184}$Pt | 162.97 8 | 3.49 13 | 403. 15 | 0.748 |
| $^{186}$Pt | 191.53 4 | 2.97 13 | 260. 12 | 0.422 |
| $^{188}$Pt | 265.63 5 | 2.59 40 | 72. 13 | 0.145 |
| $^{190}$Pt | 295.80 4 | 1.89 22 | 60. 8 | 0.104 |
| $^{192}$Pt | 316.51 1 | 1.91 7 | 43.7 9 | 0.0849 |
| $^{194}$Pt | 328.45 1 | 1.64 2 | 41.8 4 | 0.0763 |
| $^{196}$Pt | 355.68 1 | 1.37 1 | 34.15 15 | 0.0609 |
| $^{198}$Pt | 407.22 5 | 1.09 1 | 22.25 15 | 0.0421 |
| $^{200}$Pt | 470.1 2 | | | |
| | | | | |
| $^{176}$Hg | 613. | | | |
| $^{178}$Hg | | | | |
| $^{180}$Hg | 434.1 | | | |
| $^{182}$Hg | 351.8 3 | | | |
| $^{184}$Hg | 366.5 2 | 1.92 37 | 21. 5 | 0.0606 |
| $^{186}$Hg | 405.3 1 | 1.37 20 | 18. 3 | 0.0462 |
| $^{188}$Hg | 412.8 1 | | | |
| $^{190}$Hg | 416.4 2 | | | |
| $^{192}$Hg | 422.8 1 | | | |
| $^{194}$Hg | 428.0 2 | | | |
| $^{196}$Hg | 425.98 10 | 1.13 4 | 17.2 6 | 0.0406 |
| $^{198}$Hg | 411.80 1 | 0.988 5 | 23.16 12 | 0.0443 |
| $^{200}$Hg | 367.94 1 | 0.853 7 | 46.4 4 | 0.060 |
| $^{202}$Hg | 439.56 1 | 0.609 7 | 27.3 3 | 0.037 |
| $^{204}$Hg | 436.55 1 | 0.425 4 | 40.4 4 | 0.04 |
| $^{206}$Hg | 1068.5 1 | | | |
| | | | | |
| $^{186}$Pb | 662.4 5 | | | |
| $^{188}$Pb | 723.9 2 | | | |
| $^{190}$Pb | 773.8 5 | | | |
| $^{192}$Pb | 853.6 2 | | | |
| $^{194}$Pb | 965.4 1 | | | |
| $^{196}$Pb | 1049.20 9 | | | |
| $^{198}$Pb | 1063.5 2 | | | |
| $^{200}$Pb | 1026.6 2 | | | |
| $^{202}$Pb | 960.66 4 | | | |
| $^{204}$Pb | 899.17 2 | 0.166 3 | 2.88 4 | 0.0083 |
| $^{206}$Pb | 803.10 5 | 0.103 1 | 8.14 8 | 0.0104 |
| $^{208}$Pb | 4085.4 3 | 0.336 25 | 0.00074 6 | 0.0 |
| $^{210}$Pb | 799.7 1 | 0.050 11 | 17. 5 | 0.0105 |
| $^{212}$Pb | 804.9 5 | | | |
| $^{214}$Pb | 836. 2 | | | |

Table 11: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{192}$Po | 262. | | | |
| $^{194}$Po | 318.6 2 | | | |
| $^{196}$Po | 463.12 9 | | | |
| $^{198}$Po | 605.0 1 | | | |
| $^{200}$Po | 665.9 1 | | | |
| $^{202}$Po | 677.3 2 | | | |
| $^{204}$Po | 684.34 1 | | | |
| $^{206}$Po | 700.66 3 | | | |
| $^{208}$Po | 686.53 2 | | | |
| $^{210}$Po | 1181.40 2 | 0.021 4 | 5.9 12 | 0.0054 |
| $^{212}$Po | 727.33 1 | | | |
| $^{214}$Po | 609.32 1 | | | |
| $^{216}$Po | 549.76 4 | | | |
| $^{218}$Po | 511. 2 | | | |
| | | | | |
| $^{204}$Rn | 542.9 3 | | | |
| $^{206}$Rn | 575.3 1 | | | |
| $^{208}$Rn | 635.8 2 | | | |
| $^{210}$Rn | 643.8 1 | | | |
| $^{212}$Rn | 1273.8 2 | | | |
| $^{214}$Rn | 694.7 10 | | | |
| $^{216}$Rn | 461.9 2 | | | |
| $^{218}$Rn | 324.22 5 | | | |
| $^{220}$Rn | 240.99 1 | 1.86 6 | 146. 5 | 0.280 |
| $^{222}$Rn | 186.21 1 | 2.33 33 | 320. 20 | 0.692 |
| | | | | |
| $^{212}$Ra | 629.3 5 | | | |
| $^{214}$Ra | 1382.4 10 | | | |
| $^{216}$Ra | 688.2 2 | | | |
| $^{218}$Ra | 389.1 2 | 0.99 8 | 29.8 28 | 0.0738 |
| $^{220}$Ra | 178.47 12 | | | |
| $^{222}$Ra | 111.12 2 | 4.42 32 | 520. 40 | 6.26 |
| $^{224}$Ra | 84.37 1 | 3.92 7 | 746. 14 | 21.6 |
| $^{226}$Ra | 67.67 1 | 5.03 15 | 630. 20 | 61.9 |
| $^{228}$Ra | 63.82 2 | 5.86 40 | 550. 40 | 81.9 |
| $^{230}$Ra | 57.4 1 | | | |
| | | | | |
| $^{218}$Th | 689.6 6 | | | |
| $^{220}$Th | 373.3 3 | | | |
| $^{222}$Th | 183.3 3 | 2.95 23 | 240. 20 | 0.931 |
| $^{224}$Th | 98.1 3 | 3.88 25 | 590. 40 | 12.6 |
| $^{226}$Th | 72.20 4 | 6.70 32 | 395. 20 | 53.5 |
| $^{228}$Th | 57.76 1 | 6.92 12 | 405. 7 | 156. |
| $^{230}$Th | 53.20 2 | 8.01 20 | 354. 9 | 233. |
| $^{232}$Th | 49.37 1 | 8.39 35 | 345. 15 | 332. |
| $^{234}$Th | 49.55 6 | 7.83 59 | 370. 30 | 326. |

Table 12: The measured level energies and B(E2)-values are collected by [Nnd00]

| Nucleus | E($2_1^+$) (keV) | $B(E2; 0_1^+ \rightarrow 2_1^+)$ $(e^2barn^2)$ | $T_{1/2}$ (ps) | $\alpha_T$ |
|---|---|---|---|---|
| $^{228}$U | 59. 14 | | | |
| $^{230}$U | 51.72 4 | 9.30 96 | 260. 30 | 315. |
| $^{232}$U | 47.57 1 | 10.19 77 | 245. 20 | 464. |
| $^{234}$U | 43.49 1 | 9.95 27 | 252. 7 | 724. |
| $^{236}$U | 45.24 1 | 10.67 27 | 234. 6 | 597. |
| $^{238}$U | 44.91 2 | 12.32 41 | 203. 7 | 618. |
| $^{240}$U | 45. 1 | | | |
| $^{236}$Pu | 44.63 10 | | | |
| $^{238}$Pu | 44.08 3 | 12.00 33 | 177. 5 | 799. |
| $^{240}$Pu | 42.82 1 | 12.90 38 | 164. 5 | 928. |
| $^{242}$Pu | 44.54 2 | 13.44 49 | 158. 6 | 759. |
| $^{244}$Pu | 46. 2 | 13.78 18 | 155. 2 | 642. |
| $^{246}$Pu | 46. | | | |
| $^{238}$Cm | 35. 7 | | | |
| $^{240}$Cm | 38. 5 | | | |
| $^{242}$Cm | 42.13 1 | | | |
| $^{244}$Cm | 42.97 1 | 18.76 92 | 97. 5 | 1060. |
| $^{246}$Cm | 42.85 1 | 14.97 24 | 121. 2 | 1080. |
| $^{248}$Cm | 43.38 3 | 14.99 24 | 121. 2 | 1014. |
| $^{250}$Cm | 43. 5 | | | |
| $^{244}$Cf | 41. 5 | | | |
| $^{246}$Cf | 44. | | | |
| $^{248}$Cf | 41.53 6 | | | |
| $^{250}$Cf | 42.72 1 | 15.7 15 | 98. 10 | 1293. |
| $^{252}$Cf | 45.72 5 | 16.5 10 | 92. 6 | 931. |
| $^{254}$Fm | 44.99 1 | | | |

Table 13: The measured level energies and B(E2)-values are collected by [Nnd00]

# References

[Nnd00] National Nuclear Data Center, Brookhaven National Laboratory, Upton, N.Y., USA (March 2000): http://www.nndc.bnl.gov/nndc/ensdf/