|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
| **Hydrogen** | *Efg at the deuterium nucleus calculated for HD and D2* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 1 H 2 | 0 | stable | 1+ | +0.00286(2) |  | MB,R | 1979Bi14 | PR A20 381 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| **Lithium** | *Efg at the 7Li nucleus calculated for the LiH molecule* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 3 Li 6 | 0 | stable | 1+ | -0.000806(6) | [7Li] | MB | 2005Bo45/1998Ce04 | PR C72 044309 (2005)/PR A57 2539 (1998 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 3 Li 7 | 0 | stable | 3/2- | -0.0400(3) |  | MB | 2008Py02 | Mol Phys 106 1965 (2008)/PR A57 2539 (1998 |
|  |  |  |  |  |  |  |  |  |  |
|  | 3 Li 8 | 0 | 842 ms | 2+ | +0.0314(2) | [7Li] | -NMR | 2005Bo45 | PR C72 044309 (2005) |
|  |  |  |  |  |  |  |  |  |  |
|  | 3 Li 9 | 0 | 178 ms | 3/2- | -0.0304(2) | [7Li] | -NMR | 2011AV08 | J Phys G 38 075102 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 3 Li 11 | 0 | 8.5 ms | 3/2- | (-)0.0333(5) | [7Li] | -NMR | 2008Ne11 | PRL 101 132502 (2008) |
|  |  |  |  |  |  |  |  |  |  |
| **Berylium** | *Calculation of the quadrupole coupling constant for the 3P2 state of the 9Be atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 4 Be 9 | 0 | stable | 3/2- | +0.0529(4) |  | AB | 1991Su05 | CPL 177 91 (1991) |
|  |  |  |  |  |  |  |  |  |  |
| **Boron** | *Calculation of the quadrupole coupling constant of the 2P3/2 ground state of the 11B atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 8 | 0 | 0.77s | 2+ | +0.0643(14) | [11B] | -NQR | 2006Su13 | PR C74 024327 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 10 | 0 | stable | 3+ | +0.0845(2) | [11B] | AB | 2008Py02/1970Ne21 | Mol Phys 106 1965 (2008)/PR A2 1208 (1970 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 5 B 11 | 0 | stable | 3/2- | +0.04059(10) |  | AB | 2008Py02/1970Ne21 | Mol Phys 106 1965 (2008)/PR A2 1208 (1970 |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 12 | 0 | 20.4 ms | 1+ | 0.0132(3) | [11B] | -NMR | 1992Mi18 | PRL 69 2058 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 13 | 0 | 17.4 ms | 3/2- | (+)0.0365(8) | [11B] | -NMR | 2004Na38 | NP A746 509c (2004) |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 14 | 0 | 13.8 ms | 2- | 0.0297(8) | [11B] | -NMR | 1996Iz01 | PL B366 51 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 15 | 0 | 10.3 ms | 3/2- | 0.0379(11) | [11B] | -NMR | 1996Iz01 | PL B366 51 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 5 B 17 | 0 | 5.1 ms | (3/2-) | 0.0385(15) | [11B] | -NMR | 2003Og03 | PR C67 064308 (2003) |
|  |  |  |  |  |  |  |  |  |  |
| **Carbon** | *Calculation of the quadrupole coupling constant of the 3P2 state of the 11C atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 6 C 11 | 0 | 20.4 m | 3/2- | 0.0333(2) |  | AB | 2008Py02/1969Sc34 | PR 181 137 (1969) |
|  |  |  |  |  |  |  |  |  |  |
|  | 6 C 12 | 4438 | 45 fs | 2+ | +0.06(3) | [12C] | CER | 1983Ve01 | PL B122 23 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| **Nitrogen** | *Calculation of the quadrupole coupling constant of the 1P1 state of the 14N+ ion* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 7 N 12 | 0 | 11.0 ms | 1+ | +0.100(9) | [14N] | -NMR | 1998Mi10 | PL B420 31 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 7 N 14 | 0 | stable | 1+ | +0.02044(3) |  | AB/MS | 2008Py02/1997To06 | Mol Phys 106 1965 (2008)/CPL 265 60 (1997 |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 7 N 16 | 0 | 7.13 s | 2- | (-)0.018(2) | [14N] | -NMR | 2001Ma42 | PRL 86 3735 (2001) |
|  |  |  |  |  |  |  |  |  |  |
|  | 7 N 18 | 0 | 624 ms | 1- | +0.027(4) | [14N] | LMR | 1999Ne01 | PRL 82 497 (1999) Q for this state is an unresolved |
|  |  |  |  |  | (+)0.0123(12) | [14N] | -NMR | 1999Og03 | PL B451 11 (1999) proble |
|  |  |  |  |  |  |  |  |  |  |
| **Oxygen** | *Calculation of the quadrupole coupling constant of the 3P2 state of the 17O atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 8 O 13 | 0 | 8..6 ms | 3/2- | 0.0111(8) | [17O] | -NQR | 1999Ma46 | PL B459 81 (1999) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 8 O 17 | 0 | stable | 5/2+ | -0.0256(2) |  | R/EPR | 2008Py02/1969Sc34 | Mol Phys 106 1965 (2008)/PR 181 137 (1969 |
|  |  |  |  |  |  |  |  |  |  |
|  | 8 O 18 | 1982 | 2.07 ps | 2+ | -0.036(9) | [17O] | CER | 1983Gr28 | NP A411 329 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 8 O 19 | 0 | 27 s | 5/2+ | 0.00362(13) | [17O] | -NMR | 1999Mi16 | PL B457 9 (1999) |
|  |  |  |  |  |  |  |  |  |  |
| **Fluorine** | *Calculation of the quadrupole coupling constant of the F2 molecule* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 9 F 17 | 0 | 64.5 s | 5/2+ | 0.076(4) | [19F 197keV] | -NMR | 1974Mi21 | NP A236 415 (1974) |
|  |  |  |  |  |  |  |  |  |  |
|  | 9 F 18 | 1121 | 153 ns | 5+ | 0.071(6) | [19F 197keV] | -NMR | 1974Mi21 | NP A236 415 (1974) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isomer* | 9 F 19 | 197 | 88.5 ns | 5/2+ | -0.0942(9) |  | PAC | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 9 F 20 | 0 | 11 s | 2+ | 0.056(4) | [19F 197keV] | -NMR | 1974Mi21 | NP A236 415 (1974) |
|  |  |  |  |  |  |  |  |  |  |
|  | 9 F 21 | 0 | 4.16 s | 5/2+ | 0.011(2) | [19F 197keV] | -NMR | 1999Mb13 | HFI 120/121 673 (1999) |
|  |  |  |  |  |  |  |  |  |  |
|  | 9 F 22 | 0 | 4.2 s | 4+ | 0.003(2) | [19F 197keV] | -NMR | 2010Mi13 | NP A834 75c (2010) |
|  |  |  |  |  |  |  |  |  |  |
| **Neon** | *Calculation of the quadrupole coupling constant of the 3P2 state of the 21Ne atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 10 Ne 20 | 1634 | 0.7 ps | 2+ | -0.23(3) | [21Ne] | CER | 1981Sp07 | PRep 73 369 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 10 Ne 21 | 0 | stable | 3/2+ | +0.102(8) |  | O/AB | 2008Py02/1972Du06 | Mol Phys 106 1965 (2008)/PR A5 1036(1972 |
|  |  |  |  |  |  |  |  |  |  |
|  | 10 Ne 22 | 1275 | 3.6 ps | 2+ | -0.19(4) | [21Ne] | CER | 1981Sp07 | PRep 73 369 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 10 Ne 23 | 0 | 37.6 s | 5/2+ | 0.145(13) | [21Ne] | CFBLS | 2005Ge06 | PR C71 064319 (2005) |
|  |  |  |  |  |  |  |  |  |  |
| **Sodium** | *Muonic atom HFS measurements* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 20 | 0 | 0.446 s | 2+ | +0.101(8) | [23Na] | -NMR | 2009Mi04 | PL B672 120 (2009) |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 21 | 0 | 22.5 s | 3/2+ | 0.138(11) | [23Na] | -NMR | 2009Mi04 | PL B672 120 (2009) |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 22 | 0 | 2.60 y | 3+ | +0.180(11) | [23Na] | ABLS | 1998Ga44 | Eur Phys J A3 313 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 11 Na 23 | 0 | stable | 3/2+ | +0.104(1) |  | O | 2008Py02/2006Da14 | Mol Phys 106 1965 (2008)/J Phys B 39 3111 (2006 |
|  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 11 Na 25 | 0 | 60 s | 5/2+ | 0.0015(3) | [23Na] | -NMR | 2004Og13 | HFI 159 235 (2004) |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 26 | 0 | 1.07 s | 3+ | -0.0053(2) | [23Na] | CFBLS-NMR | 2000Ke09 | Eur Phys J A8 31 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 27 | 0 | 0.29 s | 5/2+ | -0.0071(3) | [23Na] | CFBLS-NMR | 2000Ke09 | Eur Phys J A8 31 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 28 | 0 | 30.5 ms | 1+ | +0.389(11) | [23Na] | CFBLS-NMR | 2000Ke09 | Eur Phys J A8 31 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 11 Na 29 | 0 | 43 ms | 3/2+ | +0.085(3) | [23Na] | CFBLS-NMR | 2000Ke09 | Eur Phys J A8 31 (2000) |
|  |  |  |  |  |  |  |  |  |  |
| **Magnesium** | *Calculation of the quadrupole coupling constant of the 3P1 state of the 25Mg atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 12 Mg 23 | 0 | 11.3 s | 3/2+ | 0.114(3) | [25Mg] | -NMR | 1999Mb13 | HFI 120/121 673 (1999) |
|  |  |  |  |  |  |  |  |  |  |
|  | 12 Mg 24 | 1369 | 1.45 ps | 2+ | -0.29(3) |  | CER | 1990Gr11 | PR C42 R471 (1990) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 12 Mg 25 | 0 | stable | 5/2+ | +0.199(2) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 12 Mg 26 | 1809 | 476 fs | 2+ | -0.21(2) |  | CER | 1991He09 | PR C43 2546 |
|  |  |  |  |  |  |  |  |  |  |
| **Aluminium** | *Calculation of the quadrupole coupling constant of the 3P3/2 state of the 27Al atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 13 Al 25 | 0 | 7.18 s | 5/2+ | 0.24(2) | [27Al] | -NQR | 2007Ma94 |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 13 Al 26 | 0 | 7x10\*5 y | 5+ | +0.26(3) | [27Al] | ABLS | 1997Le19 | JPhys G23 1145 (1997) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 13 Al 27 | 0 | stable | 5/2+ | +0.1466(10) |  | AB | 2008Py02/1968Ma23 | Mol Phys 106 1965 (2008)/PRS A305 139 (1968 |
|  |  |  |  |  |  |  |  |  |  |
|  | 13 Al 28 | 0 | 2.24 m | 3+ | 0.172(12) | [27Al] | -NMR | 1978St31 | HFI 4 170 (1978) |
|  |  |  |  |  |  |  |  |  |  |
|  | 13 Al 31 | 0 | 644 ms | (5/2+) | 0.134(2) | [27Al] | -NQR | 2009De25 | PL B678 344 (2009) |
|  |  |  |  |  |  |  |  |  |  |
|  | 13 Al 32 | 0 | 33 ms | 1+ | 0.025(2) | [27Al] | -NQR | 2007Ka68 | HFI 180 61 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 13 Al 33 | 0 | 44 ms | (5/2+) | 0.132(16) | [27Al] | -NMR | 2012Sh22 | PL B714 246 (2012) |
|  |  |  |  |  |  |  |  |  |  |
| **Silicon** | *There is no adopted reference efg for Si.* | | | |  |  |  |  |  |
|  | *A. Efg at Si in Al2O3 estimated from band structure calculations* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 14 Si 27 | 0 | 4.1 s | 5/2+ | 0.063(14) | A | -NQR | 1999Mb13 | HFI 120/121 673 (1999) |
|  |  |  |  |  |  |  |  |  |  |
|  | 14 Si 28 | 1779 | 0.49 ps | 2+ | +0.16(3) |  | CER | 1981Sp07 | PRep 73 369 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 14 Si 30 | 2235 | 0.25 ps | 2+ | -0.05(6) |  | CER | 1981Sp07 | PRep 73 369 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| **Phosphorus** | *There is no adopted reference efg for P.* | | |  |  |  |  |  |  |
|  | *A. Calculated efg at P site in*  *-Al2O3* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 15 P 28 | 0 | 270 ms | 3+ | 0.137(14) | A | -NQR | 2012Zh36 | Chin Phys Lett 29 092102 (2012) |
|  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| **Sulphur** | *Calculation of the quadrupole coupling constant of the 33S- ion* | | | | |  |  |  |  |
|  | *A. Efg at S site in FeS2* | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 16 S 32 | 2230 | 0.16 ps | 2+ | -0.16(2) |  | CER | 1982Ve09 | NP A389 185 (1982) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 16 S 33 | 0 | stable | 3/2+ | -0.0678(13) |  | MA | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 16 S 34 | 2128 | 0.32 ps | 2+ | +0.04(3) |  | CER | 1981Sp07 | PRep 73 369 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 16 S 35 | 0 | 87.4 d | 3/2+ | +0.0471(9) |  | MA | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 16 S 43 | 320 | 415 ns | 7/2- | 0.23(3) | A | TDPAD | 2012Ch16 | PRL 108 162501 (2012) |
|  |  |  |  |  |  |  |  |  |  |
| **Chlorine** | *Calculation of the quadrupole interaction at Cl in the HCl molecule* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 17 Cl 35 | 0 | stable | 3/2+ | -0.0817(8) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 17 Cl 36 | 0 | 3.0x105 y | 2+ | -0.178(4) | [35Cl] | MA | 1972St38 | PR A6 1702 (1972) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 17 Cl 37 | 0 | stable | 3/2+ | -0.0644(6) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
| **Argon** | *Calculation of the quadrupole coupling constant in the Ar atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 35 | 0 | 1.78s | 3/2+ | -0.084(15) | [37Ar] | CFBLS-NMR | 1996Kl04 | NP A607 1 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 36 | 1970 | 0.28 ps | 2+ | +0.11(6) |  | CER | 1971Na06 | PL 34B 389 (1971) |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 37 | 0 | 35.0 d | 3/2+ | +0.076(9) | calc B value | CFBLS-NMR | 1996Kl04 | NP A607 1 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 39 | 0 | 269 y | 7/2- | -0.12(3) | [37Ar] | CFBLS | 2008Bl01 | NP A799 30 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 40 | 1461 | 1.12 ps | 2+ | +0.01(4) |  | CER | 1971Na05 | PRL 24 903 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 41 | 0 | 1.82 h | 7/2- | -0.042(4) | [37Ar] | CFBLS | 2008Bl01 | NP A799 30 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 18 Ar 43 | 0 | 5.37 m | 5/2- | +0.142(14) | [37Ar] | CFBLS | 2008Bl01 | NP A799 30 (2008) |
|  |  |  |  |  |  |  |  |  |  |
| **Potassium** | *Calculation of the quadrupole coupling constant of the 4F9/2 state of the 39K atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 19 K 37 | 0 | 1.22 s | 3/2+ | +0.106(4) | [39K] | -NQR | 2008Mi07 | PL B662 389 (2008) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 19 K 39 | 0 | stable | 3/2+ | +0.0585(6) |  | AB | 2008Py02/1998Ke05 | Mol Phys 106 1965 (2008)/CPL 292 403 (1998 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 19 K 40 | 0 | 1.3x10\*9y | 4- | -0.073(1) |  | AB | 2008Py02/1998Ke05 | Mol Phys 106 1965 (2008)/CPL 292 403 (1998 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 19 K 41 | 0 | stable | 3/2+ | +0.0711(7) |  | AB | 2008Py02/1998Ke05 | Mol Phys 106 1965 (2008)/CPL 292 403 (1998 |
|  |  |  |  |  |  |  |  |  |  |
| **Calcium** | *Calculation of the quadrupole coupling constant of the 1D2 state of the Ca atom* | | | | |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 20 Ca 39 | 0 | 0.86 s | 3/2+ | 0.036(7) | calc efg | -NMR | 1999MaZI | RIKEN 32 79 (1999) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 20 Ca 41 | 0 | 1.0x105 y | 7/2- | -0.0665(18) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 20 Ca 42 | 1525 | 1.1 ps | 2+ | -0.19(8) |  | CER | 1973To07 | NP A204 574 (1973) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 20 Ca 43 | 0 | stable | 7/2- | -0.0408(8) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 20 Ca 44 | 1157 | 3.0 ps | 2+ | -0.14(7) |  | CER | 1973To07 | NP A204 574 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 20 Ca 45 | 0 | 165 d | 7/2- | +0.038(12) | [41Ca] | ABLFS | 1983Ar25 | ZP A314 303 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| **Scandium** | *Calculation of the quadrupole coupling constants in ScF, ScCl and ScBr molecules* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 21 Sc 41 | 0 | 0.59 s | 7/2- | -0.145(3) | [45Sc] | -NQR | 2002Mi37 | ZNat 57a 595 (2002) |
|  |  |  |  |  |  |  |  |  |  |
|  | 21 Sc 43 | 0 | 3.89 h | 7/2- | -0.27(5) | [45Sc] | CLS | 2011Av01 | J Phys G38 025104 (2011) |
|  |  | 3123 | 473 ns | 19/2- | 0.199(14) | [45Sc] | TDPAD | 1981Da06 | PR C23 1612 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 21 Sc 44 | 0 | 3.89 h | 2+ | +0.10(5) | [45Sc] | CLS | 2011Av01 | J Phys G38 025104 (2011) |
|  |  | 68 | 153 ns | 1- | 0.21(2) | [45Sc] | TDPAC | 1973Ha61 | JCP 58 3339 (1973) |
|  |  | 271 | 58.6 h | 6+ | -0.19(2) | [45Sc] | CLS | 2011Av01 | J Phys G38 025104 (2011) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 21 Sc 45 | 0 | stable | 7/2- | -0.220(2) |  | MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  | 12.4 | 318 ms | 3/2+ | +0.28(5) | [45Sc] | CLS | 2011Av01 | J Phys G38 025104 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 21 Sc 46 | 0 | 83.81 d | 4+ | +0.119(6) | [45Sc] | AB | 1962Pe21 | PR 128 1740 (1962) |
|  |  |  |  |  |  |  |  |  |  |
|  | 21 Sc 47 | 0 | 3.42 d | 7/2- | -0.22(3) | [45Sc] | AB | 1966Co13 | PR 141 1106 (1966) |
|  |  |  |  |  |  |  |  |  |  |
| **Titanium** | *Calculation of the quadrupole coupling constants in states of the Ti+ ion* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 22 Ti 43 | 3066 | 560 ns | 19/2- | 0.33(8) | [47Ti] | TDPAD | 1981Da06 | PR C23 1612 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 22 Ti 45 | 0 | 3.09 h | 7/2- | 0.015(15) | [47Ti][49Ti] | AB | 1966Co19 | PR 148 1157 (1966) |
|  |  |  |  |  |  |  |  |  |  |
|  | 22 Ti 46 | 889 | 5.36 ps | 2+ | -0.21(6) |  | CER | 1975To06 | NP A250 381 (1975) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 22 Ti 47 | 0 | stable | 5/2- | +0.302(10) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 22 Ti 48 | 984 | 4.29 ps | 2+ | -0.177(8) |  | ES | 1972Li12 | PL B38 475 (1972) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 22 Ti 49 | 0 | stable | 7/2- | +0.247(11) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 22 Ti 50 | 1554 | 1.12 ps | 2+ | +0.08(16) |  | CER | 1975To06 | NP A250 381 (1975) |
|  |  |  |  |  |  |  |  |  |  |
| **Vanadium** | *Calculation of the quadrupole coupling constants in states of the V atom* | | | | |  |  |  |  |
|  | *A. Calculated efg in 3d/4s excited states of the V atom* | | | | |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 23 V 50 | 0 | 1.5x1017 y | 6+ | +0.21(4) |  | ABLDF | 2008Py02/1979Er04 | Mol Phys 106 1965 (2008)/PL B85 319 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 23 V 51 | 0 | stable | 7/2- | -0.043(5) | A | LRFS | 1989Un01 | ZP D11 259 (1989) |
|  |  |  |  |  |  |  |  |  |  |
| **Chromium** | *Calculation of the quadrupole coupling constants in states of the Cr atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 24 Cr 50 | 783 | 9.2 ps | 2+ | -0.36(7) |  | CER | 1975To06 | NP A250 381 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 24 Cr 52 | 1434 | 0.707 ps | 2+ | -0.08(2) |  | ES | 1989Ra17 | JPJS 34 387 (1973) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 24 Cr 53 | 0 | stable | 3/2- | -0.15(5) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 24 Cr 54 | 835 | 8.0 ps | 2+ | -0.21(8) |  | CER | 1975To06 | NP A250 381 (1975) |
|  |  |  |  |  |  |  |  |  |  |
| **Manganese** | *Calculation of the quadrupole coupling constant for the 6D states of the Mn atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 25 Mn 50 | 229 | 1.75 m | 5+ | +0.83(12) | [Mn55] | TLS | 2010Ch15 | PL B690 346 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 25 Mn 51 | 0 | stable | 5/2- | 0.41(8) | [Mn55] | AB | 1971Jo10 | NP A166 306 (1971) |
|  |  |  |  |  |  |  |  |  |  |
|  | 25 Mn 52 | 0 | 5.80 d | 6+ | +0.50(7) | [Mn55] | NMR/ON | 1970Ni11 | Phca 50 259 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 25 Mn 53 | 0 | 3.7x106 y | 7/2- | +0.17(3) | [Mn55] | TLS | 2010Ch15 | PL B690 346 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 25 Mn 54 | 0 | 312 d | 3+ | +0.37(3) | [Mn55] | TLS | 2010Ch15 | PL B690 346 (2010) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 25 Mn 55 | 0 | stable | 5/2- | +0.330(10) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 25 Mn 56 | 0 | 2.58 h | 3+ | +0.48(15) | [Mn55] | TLS | 2010Ch15 | PL B690 346 (2010) |
|  |  |  |  |  |  |  |  |  |  |
| **Iron** | *Efg calculations in many Fe compounds* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 26 Fe 54 | 1408 | 0.80 ps | 2+ | -0.05(14) |  | CER | 1981Le02 | PR C23 244 (1981) |
|  |  | 6527 | 367 ns | 10+ | +0.30(4) | [57Fe 14 keV] | TDPAD/TF | 1984Ha07 | NP A414 316 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 26 Fe 56 | 847 | 6.9 ps | 2+ | -0.23(3) |  | CER | 1971Th14 | PR C4 1699 (1971) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 26 Fe 57 | 14 | 98 ns | 3/2- | +0.160(8) |  | ME | 2008Py02/1995Du17 | Mol Phys 106 1965 (2008)/PRL 75 3545 (1995 |
|  |  |  |  |  |  |  |  |  |  |
|  | 26 Fe 58 | 811 | 6.7 ps | 2+ | -0.27(5) |  | CER | 1981Le02 | PR C23 244 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 26 Fe 61 | 861 | 245 ns | (9/2+) | 0.44(6) | [57Fe 14 keV] | TDPAD | 2007Ve05 | PR C75 051302 (2007) |
|  |  |  |  |  |  |  |  |  |  |
| **Cobalt** | *Calculation of the quadrupole coupling constants in states of the Co atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 27 Co 56 | 0 | 78.8 d | 4+ | +0.25(9) | [59Co] | MAPON | 1988Ba87 | PR B37 4911 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 27 Co 57 | 0 | 271 d | 7/2- | +0.54(10) | [59Co] | NMR/ON | 1972Ni01 | Phca 57 1 (1972) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 27 Co 58 | 0 | 70.8 d | 2+ | +0.23(3) | [59Co] | NMR/ON | 1972Ni01 | Phca 57 1 (1972) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 27 Co 59 | 0 | stable | 7/2- | +0.42(3) |  | AB | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 27 Co 60 | 0 | 5.271 y | 5+ | +0.46(6) | [59Co] | NMR/ON | 1972Ni01 | Phca 57 1 (1972) |
|  |  |  |  |  |  |  |  |  |  |
| **Nickel** | *Calculation of the quadrupole coupling constants in states of the Ni atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 28 Ni 58 | 1454 | 0.644 ps | 2+ | -0.10(6) |  | CER | 1974Le13 | NP A223 563 (1974) |
|  |  |  |  |  |  |  |  |  |  |
|  | 28 Ni 60 | 1332 | 0.713 ps | 2+ | -0.10(2) |  | ES | 1972Li12 | PL 38B 475 (1972) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 28 Ni 61 | 0 | stable | 3/2- | +0.162(15) |  | AB | 2008Py02/1968Ch10 | Mol Phys 106 1965 (2008)/PR 170 136 (1968 |
|  |  | 67 | 5.34 ns | 5/2- | -0.20(3) | [61Ni] | ME | 1971Go31 | ZNat 26a 1931 (1971) |
|  |  |  |  |  |  |  |  |  |  |
|  | 28 Ni 62 | 1173 | 1.43 ps | 2+ | +0.05(12) |  | CER | 1974Le13 | NP A223 563 (1974) |
|  |  |  |  |  |  |  |  |  |  |
|  | 28 Ni 64 | 1346 | 0.85 ps | 2+ | +0.4(2) |  | CER | 1971ChZK | BAPS 16 625 (1971) |
|  |  |  |  |  |  |  |  |  |  |
| **Copper** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 58 | 0 | 3.2 s | 1+ | -0.16(3) | [65Cu] | CLS | 2011Vi03 | PL B703 34 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 59 | 0 | 81.5 s | 3/2- | -0.20(2) | [65Cu] | CLS | 2011Vi03 | PL B703 34 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 60 | 0 | 23.4 m | 2+ | +0.121(13) | [65Cu] | CLS | 2011Vi03 | PL B703 34 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 61 | 0 | 3.41 h | 3/2- | -0.221(10) | [65Cu] | CLS | 2011Vi03 | PL B703 34 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 62 | 0 | 9.73 m | 1+ | -0.022(4) | [65Cu] | CLS | 2011Vi03 | PL B703 34 (2011) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 29 Cu 63 | 0 | stable | 3/2- | -0.220(15) |  | Mu-X | 2008Py02/1982Ef01 | Mol Phys 106 1965 (2008)/ZP A309 77 (1982 |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 64 | 0 | 12.7 h | 1+ | +0.075(9) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 29 Cu 65 | 0 | stable | 3/2- | -0.204(14) |  | Mu-X | 2008Py02/1982Ef01 | Mol Phys 106 1965 (2008)/ZP A309 77 (1982 |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 66 | 0 | 5.1 m | 1+ | +0.059(14) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  | 1154 | 0.60 ms | 6- | (+)0.195(13) | [63Cu,65Cu] | TDPAD | 2011Lo01 | PL B694 316 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 67 | 0 | 61.83 h | 3/2- | -0.182(8) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 68 | 0 | 31.1 s | 1+ | -0.086(14) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  | 637 | 3.75 m | 6- | -0.46(2) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 69 | 0 | 2.85 m | 3/2- | -0.154(17) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 70 | 0 | 44.5 s | 6- | -0.298(15) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  | 101 | 33 s | 3- | -0.14(4) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  | 242 | 6.6 s | 1+ | -0.12(3) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 71 | 0 | 19.5 s | 3/2- | -0.200(17) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 72 | 0 | 6.62 s | 2- | +0.08(2) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 73 | 0 | 4.2 s | 3/2- | -0.210(10) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 74 | 0 | 1.63 s | 2- | +0.27(3) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 29 Cu 75 | 0 | 1.22 s | 5/2- | -0.281(17) | [65Cu] | CLS | 2010Vi07 | PR C82 064311 (2010) |
|  |  |  |  |  |  |  |  |  |  |
| **Zinc** | *Calculation of the quadrupole coupling constants in states of the Zn atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 63 | 0 | 38.1 m | 3/2- | +0.29(3) | [67Zn] | OD | 1969La05 | PR 177 1606 (1969) |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 64 | 992 | 1.85 ps | 2+ | -0.14(2) |  | ES | 1981Ko06/1976Ne06 | JPhys G7 L63 (1981)/NP A263 249 (1976 |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 65 | 0 | 244.1 d | 5/2- | -0.023(2) | [67Zn] | OD | 1964By01 | PR 134 A47 (1964) |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 66 | 1039 | 1.56 ps | 2+ | -0.081(13) |  | ES | 1981Ko06/1976Ne06 | JPhys G7 L63 (1981)/NP A263 249 (1976 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 30 Zn 67 | 0 | stable | 5/2- | +0.150(15) |  | AB | 2008Py02/1969La05 | Mol Phys 106 1965 (2008)/PR 177 1606 (1969 |
|  |  | 604 | 333 ns | 9/2+ | +0.54(5) | [67Zn] | NQR | 1976Ch37/1979Ka44 | ZP B24 177 (1976)/Sol St Comm 29 375 (1979 |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 68 | 1077 | 1.61 ps | 2+ | -0.106(16) |  | ES | 1981Ko06/1976Ne06 | JPhys G7 L63 (1981)/NP A263 249 (1976 |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 69 | 439 | 13.72 h | 9/2+ | -0.45(7) | [67Zn] | NO/S | 1983Oe01 | ZP A310 233 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 30 Zn 70 | 885 | 3.2 ps | 2+ | -0.24(3) |  | ES | 1981Ko06/1976Ne06 | JPhys G7 L63 (1981)/NP A263 249 (1976 |
|  |  |  |  |  |  |  |  |  |  |
| **Gallium** | *Calculation of the quadrupole coupling constants in GaF, GaCl and GaBr molecules* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 63 | 0 | 32.4 s | 3/2- | +0.212(4) | [69Ga] | CLS | 2012Pr11 | PR C85 034334 (2012) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 66 | 1464 | 57 ns | 7- | +0.78(4) | [69Ga][71Ga] | TDPAD | 1985Ra33 | HFI 26 855 (1985)/BAPS 24 632 (1979 |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 67 | 0 | 78.3 h | 3/2- | +0.197(2) | [69Ga][71Ga] | AB | 1968Eh02/2001Py02 | PR 176 25 (1968)/Mol Phys 99 1617 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 68 | 0 | 68.1 m | 1+ | -0.0277(14) | [69Ga][71Ga] | AB | 1972St38 | PR A6 1702 (1972) |
|  |  | 1230 | 64 ns | 7- | +0.72(2) | [69Ga][71Ga] | TDPAD | 1985Ra33 | HFI 26 855 (1985)/BAPS 24 632 (1979 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 31 Ga 69 | 0 | stable | 3/2- | +0.171(2) |  | MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 70 | 0 | 21.1 m | 1+ | +0.105(7) | [69Ga] | CLS | 2012Pr11 | PR C85 034334 (2012) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 31 Ga 71 | 0 | stable | 3/2- | +0.107(1) |  | MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 72 | 0 | 14.1 h | 3- | +0.530(6) | [69Ga][71Ga] | AB | 1968Eh02/2001Py02 | PR 176 25 (1968)/Mol Phys 99 1617 (2001 |
|  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 31 Ga 73 | 0 | 4.86 h | 3/2- | +0.209(2) | [71Ga] | CLS | 2010Ch16 | PRL 104 252502 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 74 | 0 | 8.12 m | 3- or 4- | +0.55(4) or +0.60(4) | [71Ga] | LRS | 2011Ma45 | PR C84 024303 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 75 | 0 | 126 s | 3/2- | -0.285(17) | [71Ga] | CLS | 2010Ch16 | PRL 104 252502 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 76 | 0 | 32.6 s | (2+) | +0.33(2) | [71Ga] | LRS | 2011Ma45 | PR C84 024303 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 77 | 0 | 13.2 s | 3/2- | -0.208(13) | [71Ga] | CLS | 2010Ch16 | PRL 104 252502 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 78 | 0 | 5.1 s | (2+) | +0.33(2) | [71Ga] | LRS | 2011Ma45 | PR C84 024303 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 79 | 0 | 2.85 s | 3/2- | +0.158(10) | [71Ga] | CLS | 2010Ch16 | PRL 104 252502 (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 80 | 0? | 0.2 - 1.7 s | (3-) | +0.38(2) | [71Ga] | CLS | 2010Ch50 | PR C82 051302(R) (2010) |
|  |  | 0? | 0.2 - 1.7 s | (6-) | +0.48(3) | [71Ga] | CLS | 2010Ch50 | PR C82 051302(R) (2010) |
|  |  |  |  |  |  |  |  |  |  |
|  | 31 Ga 81 | 0 | 1.22 s | 5/2- | -0.048(8) | [71Ga] | CLS | 2010Ch16 | PRL 104 252502 (2010) |
|  |  |  |  |  |  |  |  |  |  |
| **Germanium** | *Calculation of the quadrupole coupling constants in GeO, GeS molecules* | | | | |  |  |  |  |
|  | *A. Efg of Ge in Zn single crystal* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 67 | 752 | 146 ns | 9/2+ | 0.92(9) | [73Ge] | TDPAD | 1993Co17/1981Vi05 | HFI 80 1321 (1993)/HFI 10 1243 (1981 |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 69 | 0 | 39.0 h | 5/2- | +0.027(5) | [73Ge] | AB | 1970Ol02 | PR C2 228 (1970) |
|  |  | 398 | 2.8 ms | 9/2+ | 0.75(8) | [73Ge] | TDPAD | 1993Co17/1981Vi05 | HFI 80 1321 (1993)/HFI 10 1243 (1981 |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 70 | 1039 | 1.32 ps | 2+ | +0.03(6) |  | CER | 1980Le16/2000To12 | PR C22 1530 (1980)/Eur Phys J A9 353 (2000 |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 71 | 175 | 84 ns | 5/2+ | 0.18(4) | A | TDPAD | 1993Co17/1981Vi05 | HFI 80 1321 (1993)/HFI 10 1243 (1981 |
|  |  | 199 | 20.2 ms | 9/2+ | 0.34(5) |  | QIR | 1975Ri03/1976Br41 | PS 11 228 (1975)/HFI 2 265 (1976 |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 72 | 834 | 3.29 ps | 2+ | -0.13(6) |  | CER | 1980Le16/2000To12 | PR C22 1530 (1980)/Eur Phys J A9 353 (2000 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 32 Ge 73 | 0 | stable | 9/2+ | -0.196(1) |  | MS | 2008Py02/1999Ke17 | Mol Phys 106 1965 (2008)/Mol Phys 96 275 (1999 |
|  |  | 13 | 2.86 ms | 5/2+ | 0.70(8) | A | TDPAC | 1993Co17/1981Vi05 | HFI 80 1321 (1993)/HFI 10 1243 (1981 |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 74 | 596 | 12.5 ps | 2+ | -0.19(2) |  | CER | 2000To12 | Eur Phys J A9 353 (2000) |
|  |  | 1204 | 4.9 ps | 2+ | -0.26(6) |  | CER | 2000To12 | Eur Phys J A9 353 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 32 Ge 76 | 563 | 18.6 ps | 2+ | -0.19(6) |  | CER | 1980Le16/2000To12 | PR C22 1530 (1980)/Eur Phys J A9 353 (2000 |
|  |  |  |  |  |  |  |  |  |  |
| **Arsenic** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 33 As 70 | 0 | 53 m | 4+ | +0.09(2) | [75As] | AB | 1980Ho02 | ZP A294 1 (1980) |
|  |  |  |  |  |  |  |  |  |  |
|  | 33 As 71 | 0 | 65.3 h | 5/2- | -0.021(6) | [75As] | NO/S | 1988Wh03 | HFI 43 205 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 33 As 72 | 0 | 26 h | 2- | -0.08(2) | [75As] | AB | 1980Ho02 | ZP A294 1 (1980) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 33 As 73 | 66 | 5.0 ns | 5/2- | +0.356(12) | [75As] | TDPAC | 1992Sc21 | ZP A343 279 (1992) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 33 As 75 | 0 | stable | 3/2- | +0.314(6) |  | Mu-X | 2008Py02/1982Ef01 | Mol Phys 106 1965 (2008)/ZP A309 77 (1982 |
|  |  |  |  |  |  |  |  |  |  |
| **Selenium** | *Calculation of the quadrupole coupling constant in Se metal* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 74 | 635 | 7.08 ps | 2+ | -0.36(7) |  | CER | 1978Le22 | PR C18 2801 (1978) |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 75 | 0 | 118.5 d | 5/2+ | 1.1(2) | [77Se] | MA | 1955Aa06 | PR 98 1224 (1955) |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 76 | 559 | 12.3 ps | 2+ | -0.34(7) |  | CER | 1977Le11 | NP A284 123 (1977) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 34 Se 77 | 250 | 9.56 ns | 5/2- | +0.76(5) |  | TDPAC | 2008Py02/1983Un02 | Mol Phys 106 1965 (2008)/HFI 14 119 (1983 |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 78 | 614 | 8.6 ps | 2+ | -0.26(9) |  | CER | 1977Le11 | NP A284 123 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 79 | 0 | <6.5x104 y | 7/2+ | +0.8(2) | [77Se] | MA | 1989Ra17 | ADNDT 42 189 (1989)/OSpk 12 163 (1962) |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 80 | 666 | 8.0 ps | 2+ | -0.31(7) |  | CER | 1977Le11 | NP A284 123 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 34 Se 82 | 654 | 11.3 ps | 2+ | -0.22(7) |  | CER | 1977Le11 | NP A284 123 (1977) |
|  |  |  |  |  |  |  |  |  |  |
| **Bromine** | *Calculation of the quadrupole coupling constants in states of the Br atom and in HBr* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 35 Br 76 | 0 | 16.1 h | 1- | +0.255(4) | [79Br] | AB | 1960Li11 | PR 119 1053 (1960) |
|  |  |  |  |  |  |  |  |  |  |
|  | 35 Br 77 | 0 | 57 h | 3/2- | +0.51(2) | m | MAPON | 1998Se09 | PRL 80 5289 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 35 Br 79 | 0 | stable | 3/2- | +0.313(3) |  | AB/MS | 2008Py02/2001Bi17 | Mol Phys 106 1965 (2008)/PR A64 052507 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 35 Br 80 | 0 | 17.6 m | 1+ | +0.185(3) | [79Br] | AB | 1964Wh05 | PR 136 B584 (1964) |
|  |  | 37 | 7.4 ns | 2- | 0.164(6) | [79Br] | AB | 1978Ta24 | HP Ac 51 755 (1978) |
|  |  | 86 | 4.42 h | 5- | +0.710(10) | [79Br] | AB | 1964Wh05 | PR 136 B584 (1964) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 35 Br 81 | 0 | stable | 3/2- | +0.262(3) | [79Br] | AB/MS | 2008Py02/2001Bi17 | Mol Phys 106 1965 (2008)/PR A64 052507 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 35 Br 82 | 0 | 35.3 h | 5- | +0.707(10) | [79Br] | AB | 1959Ga12 | PR 116 393 (1959) |
|  |  |  |  |  |  |  |  |  |  |
| **Krypton** | *Calculation of the quadrupole coupling constants in KrH+* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 75 | 0 | 4.3 m | 5/2+ | +1.137(13) | [83Kr] | CFBLS | 1995Ke04 | NP A586 219 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 77 | 0 | 74.4 m | 5/2+ | +0.948(10) | [83Kr] | CFBLS | 1995Ke04 | NP A586 219 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 79 | 130 | 50 s | 7/2+ | +0.404(5) | [83Kr] | CFBLS | 1995Ke04 | NP A586 219 (1995) |
|  |  | 147 | 77.7 ns | 5/2- | +0.45(3) | [83Kr] | TDPAD | 1978HaXP | ARHMI 50 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 81 | 0 | 2.3 x 10\*5 y | 7/2+ | +0.644(4) | [83Kr] | LRFS | 1993Ca41 | PR A47 1148 (1993) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
| *Reference isotope* | 36 Kr 83 | 0 | stable | 9/2+ | +0.259(1) |  | MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  | 9 | 147 ns | 7/2+ | +0.507(3) | [83Kr] | ME | 1977Ho33 | JCP 66 2627 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 84 | 3236 | 1.84 ms | 8+ | +0.36(4) | [83Kr] | LEMS | 2006Sc22 | PR C74 034309 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 85 | 0 | 10.76 y | 9/2+ | +0.443(3) | [83Kr] | LRFS | 1993Ca41 | PR A47 1148 (1993) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 87 | 0 | 76.3 m | 5/2+ | -0.300(3) | [83Kr] | CFBLS | 1995Ke04 | NP A586 219 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 89 | 0 | 3.15 m | 3/2+ | +0.166(2) | [83Kr] | CFBLS | 1995Ke04 | NP A586 219 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 91 | 0 | 8.57 s | 5/2+ | +0.303(6) | [83Kr] | CFBLS | 1995Ke04 | NP A586 219 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 36 Kr 94 | 666 | 8.7 ps | 2+ | -0.5(3) |  | CER | 2012 Al03 | PRL 108 062701 (2012) |
|  |  |  |  |  |  |  |  |  |  |
| **Rubidium** | *Calculation of the quadrupole coupling constants in RbF* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 76 | 0 | 39 s | 1(-) | +0.46(20) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 77 | 0 | 3.8 m | 3/2- | +0.84(17) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 78 | 103 | 6.3 m | 4- | +0.99(20) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 79 | 0 | 23 m | 5/2+ | -0.12(4) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 80 | 0 | 30 s | 1+ | +0.42(8) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 81 | 0 | 4.58 h | 3/2- | +0.48(10) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  | 86 | 32 m | 9/2+ | -0.90(19) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 82 | 0 | 1.25 m | 1+ | +0.23(10) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  | ~100 | 6.47 h | 5- | +1.22(27) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 83 | 0 | 86.2 d | 5/2- | +0.24(5) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 84 | 0 | 33 d | 2- | -0.02(4) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  | 465 | 20.4 m | 6- | +0.70(36) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 37 Rb 85 | 0 | stable | 5/2- | +0.276(1) |  | MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  | 514 | 1.02 ms | 9/2+ | -0.9(3) | [85Rb] | OPD | 1991Ma21 | PRL 66 1681 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 86 | 0 | 18.65 d | 2- | +0.23(6) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  | 556 | 1.02 m | (6-) | +0.45(14) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 37 Rb 87 | 0 | 4.9 10\*10y | 3/2- | +0.1335(5) |  | MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 88 | 0 | 17.7 m | 2- | -0.01(11) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 89 | 0 | 15.2 m | 3/2- | +0.17(3) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 37 Rb 90 | 107 | 4.26 m | 3- | +0.25(7) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 91 | 0 | 58 s | 3/2(-) | +0.19(5) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 93 | 0 | 5.85 s | 5/2- | +0.21(6) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 94 | 0 | 2.73 s | 3(-) | +0.20(7) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 95 | 0 | 0.38 s | 5/2- | +0.26(9) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 96 | 0 | 0.20 s | 2+ | +0.30(9) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 37 Rb 97 | 0 | 0.17 s | 3/2- | +0.70)15) | [85Rb] | ABLS | 1981Th04 | PR C23 2720 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| **Strontium** | *Calculation of the quadrupole coupling constants in the 4d 2D5/2 and 5P3/2 states of the Sr+ ion* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 77 | 0 | 9 s | 5/2+ | +1.27(5) | [87Sr] | CFBLS | 1992Li11 | PR C46 797 (1992 |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 79 | 0 | 2.25 m | (3/2-) | +0.661(6) | [87Sr] | CFBLS | 1990Bu12 | PR C41 2883 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 83 | 0 | 32.4 h | 7/2+ | +0.708(11) | [87Sr] | CFBLS | 1990Bu12 | PR C41 2883 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 85 | 0 | 64.8 d | 9/2+ | +0.263(14) | [87Sr] | CFBLS | 1990Bu12 | PR C41 2883 (1990) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 38 Sr 87 | 0 | stable | 9/2+ | +0.305(2) |  | AB | 2008Py02/2006Sa21 | Mol Phys 106 1965 (2008)/PR A73 062501 (2006 |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 89 | 0 | 50.5 d | 5/2+ | -0.253(8) | [87Sr] | CFBLS | 1990Bu12 | PR C41 2883 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 91 | 0 | 9.5 h | 5/2+ | +0.042(10) | [87Sr] | CFBLS | 1990Bu12 | PR C41 2883 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 93 | 0 | 7.4 m | 5/2+ | +0.240(10) | [87Sr] | CFBLS | 1990Bu12 | PR C41 2883 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 38 Sr 99 | 0 | 0.269 s | 3/2+ | +0.76(4) | [87Sr] | CFBLS | 1991Li05 | PL B256 141 (1991) |
|  |  |  |  |  |  |  |  |  |  |
| **Yttrium** | *Calculation of the quadrupole coupling constants in the 4d5s2 2D states of the Y atom* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 87 | 381 | 13.4 h | 9/2+ | -0.50(6) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 88 | 0 | 106 d | 4- | +0.16(3) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  | 675 | 14 ms | 8+ | +0.06(6) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 89 | 909 | 16.1 s | 9/2+ | -0.43(6) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 39 Y 90 | 0 | 64.1 h | 2- | -0.125(11) |  | AB | 2008Py02/1998Bi20 | Mol Phys 106 1965 (2008)/PR A58 4401 (1998 |
|  |  | 682 | 3.19 h | 7+ | -0.65(8) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 92 | 0 | 3.54 h | 2- | 0.00(2) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 93 | 758 | 0.82 s | 9/2+ | -0.64(8) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 39 Y 94 | 0 | 18.7 m | 2- | -0.03(3) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 96 | 1140 | 9.6 s | 8+ | -0.98(11) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 97 | 668 | 1.17 s | 9/2+ | -0.76(8) | [90Y] | CLS | 2007Ch07 | PL B645 133 (2007) |
|  |  | 3522 | 142 ms | (27/2) | -1.21(14) | [90Y] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 98 | 410 | 2.0 s | 4 or 5 | +1.7(2) or +1.8(2) | [90Y] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 99 | 0 | 1.47 s | 5/2+ | +1.55(17) | [90Y] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 100 | (143) | 0.94 s | 4 | +1.85(20) | [90Y] | CLS | 2007Bi14/2010Ba31 | PL B645 330 (2007)/J Phys G37 105103 (2010 |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 101 | 0 | 0.45 s | 5/2+ | +1.53(17) | [90Y] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 39 Y 102 | 0 + x | 0.3 s | 2 or 3 | +1.17(13) or +1.36(16) | [90Y] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  |  |  |  |  |  |  |  |  |
| **Zirconium** | *Calculation of the quadrupole coupling constants in the ZrO and ZrS molecules* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 40 Zr 87 | 0 | 1.68 h | 9/2+ | +0.42(5) | [91Zr] | CLS | 2003Th03 | J Phys G29 2247 (2003) |
|  |  |  |  |  |  |  |  |  |  |
|  | 40 Zr 88 | 2889 | 1.32 ms | 8+ | +0.44(3) | [91Zr] | TDPAD/TFLD | 1985Ra09/1986Be06 | PRL 54 2592 (1985)/PR C33 1517 (1986 |
|  |  |  |  |  |  |  |  |  |  |
|  | 40 Zr 89 | 0 | 78.4 h | 9/2+ | +0.28(10) | [91Zr] | CLS | 2003Th03 | J Phys G29 2247 (2003) |
|  |  |  |  |  |  |  |  |  |  |
|  | 40 Zr 90 | 3589 | 134 ns | 8+ | -0.44(3) | [91Zr] | TDPAD/TFLD | 1985Ra09/1986Be06 | PRL 54 2592 (1985)/PR C33 1517 (1986 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 40 Zr 91 | 0 | stable | 5/2+ | -0.176(3) |  | MS | 2008Py02/2000Ke03 | Mol Phys 106 1965 (2008)/CPL 318 222 (2000 |
|  |  | 3167 | 3.6 ms | 21/2+ | 0.71(4) | [91Zr] | TDPAD | 1985Ra09 | PRL 54 2592 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 40 Zr 95 | 0 | 64.0 d | 5/2+ | +0.22(2) | [5- 90mZr calc] | MAPON | 1998Se01 | PRL 80 924 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 40 Zr 101 | 0 | 2.4s | 3/2+ | +0.81(6) | [91Zr] | CLS | 2002Ca37 | PRL 89 082501 (2002) |
|  |  |  |  |  |  |  |  |  |  |
| **Niobium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 41 Nb 90 | 0 | 14.6 h | 8+ | +0.01(4) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  | 125 | 18.8 s | 4- | -0.26(4) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  |  |  |  |  |  |  |  |  |
|  | 41 Nb 91 | 0 | 680 y | 9/2+ | -0.25(3) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  |  |  |  |  |  |  |  |  |
|  | 41 Nb 92 | 0 | 3.5 x 107 y | 7+ | -0.35(3) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 41 Nb 93 | 0 | stable | 9/2+ | -0.32(2) |  | Mu-X | 2008Py02/1973Po15 | Mol Phys 106 1965 (2008)/NP A217 573 (1973 |
|  |  |  |  |  |  |  |  |  |  |
|  | 41 Nb 99 | 0 | 15 s | 9/2+ | -0.41(14) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  |  |  |  |  |  |  |  |  |
|  | 41 Nb 101 | 0 | 7.1 s | 5/2+ | +1.05(7) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 41 Nb 103 | 0 | 1.5 s | 5/2+ | +1.08(9) | [93Nb] | CLS | 2009Ch25 | PRL 102 222501 (2009) |
|  |  |  |  |  |  |  |  |  |  |
| **Molybdenum** | *Estimation of the quadrupole coupling constant in states of the Mo atom* | | | | |  |  |  |  |
|  | *A. Normalised to Q of 92Mo 2760 keV state estimated from B(E2)* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 42 Mo 90 | 2875 | 1.1 ms | 8+ | 0.61(3) | A | TDPAD | 1985Ra09 | PRL 54 2592 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 42 Mo 92 | 2760 | 190 ns | 8+ | (-)0.36 |  | not measured | 1991Ha04 | PR C43 2140 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 42 Mo 94 | 871 | 2.9 ps | 2+ | -0.13(8) or +0.01(8) |  | CER | 1976Pa13 | PR C14 835 (1976) |
|  |  | 2956 | 98 ns | 8+ | 0.50(1) | A | TDPAD | 1985Ra09 | PRL 54 2592 (1985) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 42 Mo 95 | 0 | stable | 5/2+ | -0.022(1)) |  | AB | 2008Py02/1982BuZE | Mol Phys 106 1965 (2008)/STMP vol 96 |
|  |  |  |  |  |  |  |  |  |  |
|  | 42 Mo 96 | 778 | 3.7 ps | 2+ | -0.20(8) or +0.04(8) |  | CER | 1976Pa13 | PR C14 835 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 42 Mo 97 | 0 | stable | 5/2+ | +0.255(13) |  | AB | 2008Py02/1982BuZE | Mol Phys 106 1965 (2008)/STMP vol 96 |
|  |  |  |  |  |  |  |  |  |  |
|  | 42 Mo 98 | 787 | 3.5 ps | 2+ | -0.26(9) |  | CER | 1979Pa11 | PR C20 1201 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 42 Mo 100 | 536 | 10.3 ps | 2+ | -0.25(7) |  | CER | 2011Wr01 | Acta Phys Pol B42 803 (2011) |
|  |  |  |  |  |  |  |  |  |  |
| **Technetium** | *Estimation of the quadrupole coupling constant in states of the Tc atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 43 Tc 99 | 0 | 2.1x10\*5y | 9/2+ | -0.129(6) |  | AB | 2008Py02/1982BuZE | Mol Phys 106 1965 (2008)/STMP vol 96 |
|  |  |  |  |  |  |  |  |  |  |
| **Ruthenium** | *Calculated hyperfine structure in the 5F multiplet of the Ru atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 93 | 2082 | 2.4 ms | 21/2+ | +0.04(1) | [99Ru] | TDPAD | 1991Ha04 | PR C43 2140 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 96 | 833 | 2.7 ps | 2+ | -0.15(8) |  | CER | 1998Hi01 | PR C57 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 98 | 653 | 5.9 ps | 2+ | -0.21(8) or -0.01(9) |  | CER | 1998Hi01 | PR C57 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 44 Ru 99 | 0 | stable | 5/2+ | +0.079(4) |  | AB | 2008Py02/1982BuZE | Mol Phys 106 1965 (2008)/STMP vol 96 |
|  |  | 90 | 20.5 ns | 3/2+ | +0.231(13) | [99Ru] | ME | 1976Ki02 | PR C13 1132 (1976) |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 100 | 540 | 12 ps | 2+ | -0.44(4) or -0.27(7) |  | CER | 1998Hi01 | PR C57 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 44 Ru 101 | 0 | stable | 5/2+ | +0.46(2) |  | AB | 2008Py02/1982BuZE | Mol Phys 106 1965 (2008)/STMP vol 96 |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 102 | 475 | 18 ps | 2+ | -0.63(4) or -0.34(3) |  | CER | 1998Hi01 | PR C57 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 103 | 0 | 39.4 d | 3/2+ | +0.62(2) | [99Ru 90 keV] | NO/S | 1986Gr26 | HFI 30 355 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 44 Ru 104 | 358 | 58 ps | 2+ | -0.78(7) or -0.20(12) |  | CER | 1998Hi01 | PR C57 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| **Rhodium** | *Calculation of the quadrupole coupling constants in Rh intermettalic compounds* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
| *Reference isotope* | 45 Rh 100 | 74 | 214 ns | (2)+ | 0.153 (18) |  | PAC | 2008Py02/1996Bl15 | Mol Phys 106 1965 (2008)/HFI 97/98 3 (1996 |
|  |  |  |  |  |  |  |  |  |  |
|  | 45 Rh 103 | 295 | 6.7 ps | 3/2- | -0.3(2) |  | CERP | 1976Ge19 | Z Phys A 279 183 (1976) |
|  |  | 357 | 73 ps | 5/2- | -0.4(2) |  | CERP | 1976Ge19 | Z Phys A 279 183 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| **Palladium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 46 Pd 102 | 556 | 11.3 ps | 2+ | -0.20(15) |  | CERP | 1977Fa11 | NIM 146 329 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 46 Pd 104 | 556 | 9.7 ps | 2+ | -0.46(11) |  | CERP | 1977Fa11 | NIM 146 329 (1977) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 46 Pd 105 | 0 | stable | 5/2+ | +0.660(11) |  | Mu-X | 2008Py02/1978Vu01 | Mol Phys 106 1965 (2008)/NP A294 273 (1978 |
|  |  |  |  |  |  |  |  |  |  |
|  | 46 Pd 106 | 512 | 12 ps | 2+ | -0.51(7) |  | ES | 1973Ho05 | PRL 30 388 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 46 Pd 108 | 434 | 23 ps | 2+ | -0.58(4) |  | ES | 1978Ar07 | J Phys G4 961 (1978) |
|  |  |  |  |  |  |  |  |  |  |
|  | 46 Pd 110 | 374 | 46 ps | 2+ | -0.47(3) |  | ES | 1976Li19 | PR C14 952 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| **Silver** | *Calculation of the quadrupole coupling constant in the Ag atom* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 101 | 0 | 11.4 m | 9/2+ | +0.35(5) | [110Ag 118 keV] | CLS | 1989Di12 | NP A503 331 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 103 | 0 | 1.10 h | 7/2+ | +0.84(9) | [110Ag 118 keV] | CLS | 1989Di12 | NP A503 331 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 104 | 0 | 69 m | 5+ | +1.06(11) | [110Ag 118 keV] | CLS | 1989Di12 | NP A503 331 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 105 | 25 | 7.2 m | 7/2+ | +0.85(11) | [110Ag 118 keV] | CLS | 1989Di12 | NP A503 331 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 106 | 90 | 8.5 d | 6+ | 1.11(11) | [110Ag 118 keV] | CLS | 1989Di12 | NP A503 331 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 107 | 93 | 44.3 s | 7/2+ | 0.98(11) | [110Ag 118 keV] | LMR | 1986Be01/1984Be53 | PR C33 390 (1986)/PR C30 2028 (1984 |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 108 | 110 | 418 y | 6+ | +1.32(7) | [110Ag 118 keV] | O | 1984Be53 | PR C30 2028 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 109 | 88 | 39.8 s | 7/2+ | (+)1.02(12) | [110Ag 118 keV] | LMR | 1986Be01/1984Be53 | PR C33 390 (1986)/PR C30 2028 (1984 |
|  |  | 311 | 5.9 ps | 3/2- | -0.7(3) |  | CER | 1972Th16 | PL 41B 585 (1972) |
|  |  | 415 | 35 ps | 5/2- | -0.3(3) |  | CER | 1972Th16 | PL 41B 585 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 47 Ag 110 | 0 | 24.4 s | 1+ | 0.24(12) |  | QIR | 1981Do17 | HFI 10 727 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isomer* |  | 118 | 252 d | 6+ | +1.44(10) |  | O | 1984Be53 | PR C30 2028 (1984) |
|  |  |  |  |  |  |  |  |  |  |
| **Cadmium** | *There is no adopted reference efg for Cd.* | | | |  |  |  |  |  |
|  | *A. Efg in 2P5/2 state of the Cd ion* | | |  |  |  |  |  | (PRL 110 192501 (2013) |
|  | *B. For the efg used to obtain Q(109Cd)/Q(109Cd 463 keV) see 1969La06/1978Sp09* | | | | | |  |  | PR 177 1615 (1969)/HFI 4 229 (1978 |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 102 | 2718 | 56 ns | 8+ | 0.76(9) | [efg Cd in Cd] | TDPAD | 1992Al17 | Z Phys A344 1 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 103 | 0 | 7.3 m | 5/2+ | -0.7(6) | A | CLS | 1987Bu01 | NP A462 305 (1987) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 105 | 0 | 56 m | 5/2+ | +0.37(4) | A | OD | 1969La06 | PR 177 1615 (1969) |
|  |  | 2517 | 4.5 ms | 21/2+ | +1.02(10) | B | TDPAC | 1978Sp09 | HFI 4 229 (1978) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 106 | 633 | 7.3 ps | 2+ | -0.28(8) |  | CER | 1976Es02 | NP A274 237 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 107 | 0 | 6.50 h | 5/2+ | +0.60(2) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  | 846 | 70 ns | 11/2- | -0.94(10) | B | TDPAC | 1978Sp09 | HFI 4 229 (1978) |
|  |  | 2679 | 56 ns | 21/2+ | +1.05(11) | B | TDPAC | 1978Sp09 | HFI 4 229 (1978) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 108 | 633 | 6.8 ps | 2+ | -0.45(8) |  | CER | 1976Es02 | NP A274 237 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 109 | 0 | 453 d | 5/2+ | +0.60(3) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  | 463 | 10.9 ms | 11/2- | [-0.92(9)] | systematic | not measured | 1978Sp09 | HFI 4 229 (1978) |
|  |  |  |  |  |  | extrapolation |  |  |  |
|  | 48 Cd 110 | 658 | 5.0 ps | 2+ | -0.40(4) |  | ES | 1977Gi13 | J Phys G3 L169 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 111 | 245 | 84 ns | 5/2+ | +0.74(7) | B | TDPAC | 1978Sp09 | HFI 4 229 (1978) |
|  |  | 396 | 48.6 m | 11/2- | -0.75(3) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 112 | 617 | 6.2 ps | 2+ | -0.37(4) |  | ES | 1977Gi13 | J Phys G3 L169 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 113 | 264 | 14 y | 11/2- | -0.61(3) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 114 | 558 | 9.0 ps | 2+ | -0.348(12) |  | ES | 1981Ko06 | J Phys G7 L63 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 115 | 173 | 44.8 d | 11/2- | -0.48(2) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 116 | 514 | 15 ps | 2+ | -0.42(4) |  | ES | 1977Gi13 | J Phys G3 L169 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 117 | 136 | 3.36 h | 11/2- | -0.320(13) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 119 | 147 | 2.20 m | 11/2- | -0.135(6) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 121 | 215 | 8.3 s | 11/2- | +0.009(6) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 123 | 317 | 1.82 s | 11/2- | +0.135(7) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 125 | 0 | 0.68 s | 3/2+ | +0.209(10) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  | x | 0.48 s | 11/2- | +0.269(13) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 127 | 0 | 0.37 s | 3/2+ | +0.239(11) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  | x | - | 11/2- | +0.34(2) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
|  | 48 Cd 129 | 0 | 0.27 s | 3/2+ | +0.132(9) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  | x | - | 11/2- | +0.57(3) | A | CLS | 2013Yo02 | PRL 110 192501 (2013) |
|  |  |  |  |  |  |  |  |  |  |
| **Indium** | *Calculated electric quadrupole interactions in indium halides* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 104 | 0 | 1.7 m | 5+ | +0.63(10) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 105 | 0 | 5.07 m | 9/2+ | +0.79(5) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 106 | 0 | 6.2 m | 7+ | +0.92(6) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 107 | 0 | 32.4 min | 9/2+ | +0.77(5) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 108 | 0 | 58 m | 7+ | +0.955(7) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | 29 | 40 m | 2+ | '+0.444(13) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 109 | 0 | 4.2 h | 9/2+ | +0.80(3) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 110 | 0\* | 69.1 m | 2+ | +0.32(2) | [113In] | AB | 1968CaZX | Th 68 Cass. |
|  |  | 0\* | 4.9 h | 7+ | +0.95(2) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 111 | 0 | 2.83 d | 9/2+ | +0.76(2) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 112 | 0\* | 14.4 m | 1+ | +0.082(5) | [113In] | AB | 1968CaZX | Th 68 Cass. |
|  |  | 157 | 20.9 m | 4+ | +0.679(10) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | 351 | 0.69 ms | 7+ | 1.00(3) | [117In 660 keV] | TDPAD | 1993Io02 | HFI 77 111 (1993) |
|  |  | 614 | 2.82 ms | 8- | 0.092(3) | [117In 660 keV] | TDPAD | 1993Io02 | HFI 77 111 (1993) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 49 In 113 | 0 | stable | 9/2+ | 0.759(8) |  | AB/MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 114 | 190 | 49.5 d | 5+ | +0.703(11) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 49 In 115 | 0 | 4.4x10\*14 y | 9/2+ | 0.770(8) |  | AB/MS | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  | 829 | 5.78 ns | 3/2+ | -0.59(4) | [117In 660 keV] | TDPAC | 1973Ha61 | JCP 58 3339 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 116 | 0 | 14.1 s | 1+ | 0.11(1) | [115In] | NSLR | 1982Gr17 | NP A386 56 (1982) |
|  |  | 127 | 54.2 m | 5+ | +0.762(11) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | 290 | 2.18 s | 8- | +0.295(9) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 117 | 0 | 42 m | 9/2+ | +0.788(10) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | 660 | 53.6 ns | 3/2+ | -0.57(4) | [115In] | TDPAC | 1972Ra27 | PRL 28 54 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 118 | ~60 | 4.45 m | 5+ | +0.757(8) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | ~200 | 8.5 s | 8- | +0.419(7) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 119 | 0 | 2.4 m | 9/2+ | +0.812(7) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | 654 | 130 ns | 3/2+ | 0.59(4) | [115In] | TDPAC | 1980HaYW | ARHMI 1979 75 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 120 | (0) | 44.4 s | 5+ | +0.770(16) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | (0) | 47.3 s | 8- | +0.504(10) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 121 | 0 | 23.1 s | 9/2+ | +0.774(10) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 122 | 0+x | 9.2 s | 5+ | +0.77(2) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | ~220 | 10.5s | 8- | +0.56(2) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 49 In 123 | 0 | 6.68 s | 9/2+ | +0.720(9) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 124 | 0 | 3.09 s | 3+ | +0.58(7) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | 190 | 3.7 s | 8- | +0.631(9) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 125 | 0 | 2.50 s | 9/2+ | +0.68(3) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 126 | (0) | 1.60 s | 3+ | +0.47(5) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  | (0) | 1.64 s | 8- | +0.649(11) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 49 In 127 | 0 | 1.22 s | 9/2+ | +0.56(3) | [115In] | CFBLS | 1987Eb02 | NP A464 9 (1987) |
|  |  |  |  |  |  |  |  |  |  |
| **Tin** | *There is no adopted reference efg for Sn.* | | | |  |  |  |  |  |
|  | *A - relative to 119Sn 24 keV - calculation of the quadrupole coupling constants in many molecular tin compounds.* | | | | | | |  |  |
|  | *B - relative to 117Sn 315 keV - calculation of quadrupole interaction in the 5p6s;3P1 state of the tin atom. At present this calculation is accurate only to, at best, +/- 10-20%.* | | | | | | | | |
|  | *C-relative to 116Sn 3548 keV 10+ moment estimated from theory. Accuracy estimated at 10%.* | | | | | |  |  |  |
|  | *D- relative to 118Sn 3106 keV 10+ moment estimated from theory. Accuracy estimated at 10%.* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 109 | 0 | 18.0 m | 5/2+ | +0.33(11) | B | ABLFS | 1987Eb01 | ZP A326 121 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 110 | 2480 | 5.6 ns | 6+ | 0.30(4) | D | TDPAD | 1989Vo17 | IAN Ser Fiz 53 2188 (1989 |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 111 | 0 | 35 m | 7/2+ | +0.20(10) | B | ABLFS | 1987Eb01 | ZP A326 121 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 112 | 1257 | 0.35 ps | 2+ | -0.09(10) |  | CER | 1975Gr30 | PR C12 1462 (1975) |
|  |  | 2550 | 13.7 ns | 6+ | (-)0.25(5) | C | TDPAD | 1975Vi03 | NP A243 29 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 113 | 739 | 82 ns | 11/2- | (-)0.41(4) | C | TDPAD | 1975Di02 | PL B55 293 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 114 | 3088 | 765 ns | 7- | (-)0.32(3) | C | TDPAD | 1975Di02 | PL B55 293 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 115 | 613 | 3.26 ps | 7/2+ | (-)0.26(3) | D | TDPAD | 1976Be59 | HFI 2 326 (1976) |
|  |  | 714 | 159 µs | 11/2- | 0.38(6) |  | QIR | 1975Ri03 | Phys Scr 11 228 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 116 | 1294 | 0.36 ps | 2+ | -0.17(4) |  | ES | 1976Li19 | PR C14 952 (1976) |
|  |  | 2366 | 370 ns | 5- | (-)0.26(3) | C | TDPAD | 1975Di02 | PL B55 293 (1975) |
|  |  | 3548 | 904 ns | 10+ | [(-)0.41(4)] | C | not measured | 1975Di02 | PL B55 293 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 117 | 315 | 13.6 d | 11/2- | -0.42(5) | B | ABLFS | 1986An24 | PR C34 1052 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 118 | 1230 | 0.46 ps | 2+ | -0.14(10) |  | CER | 1975Gr30 | PR C12 1462 (1975) |
|  |  | 2321 | 21.7 ns | 5- | (-)0.22(3) | C | TDPAD | 1975Di02 | PL B55 293 (1975) |
|  |  | 2575 | 217 ns | 7- | 0.32(3) | D | TDPAD | 1976Be59 | HFI 2 326 (1976) |
|  |  | 3106 | 2.65 ms | 10+ | [0.41(4)] | D | not measured | 1976Be59 | HFI 2 326 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference Isotope* | 50 Sn 119 | 24 | 17.8 ns | 3/2+ | -0.132(1) |  | ME | 2008Py02/2008Ba56 | Mol Phys 106 1965 (2008)/JPC A112 1666 (2008 |
|  |  | 90 | 293.1 d | 11/2- | -0.29(3) | A | ME | 1972Be79 | PL B42 349 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 120 | 1171 | 0.64 ps | 2+ | +0.02(7) |  | CER | 1975Gr30 | PR C12 1462 (1975) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  | 2285 | 5.53 ns | 5- | 0.046(2) | A | TDPAC | 1970Wo02 | ZP 232 256 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 121 | 0 | 27.1 h | 3/2+ | -0.02(2) | B | ABLFS | 1986An24 | PR C34 1052 (1986) |
|  |  | 6.3 | 55 y | 11/2- | -0.14(3) | B | ABLFS | 1986An24 | PR C34 1052 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 122 | 1140 | 0.76 ps | 2+ | -0.13(10) |  | CER | 1975Gr30 | PR C12 1462 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 123 | 0 | 129 d | 11/2- | +0.03(4) | B | ABLFS | 1986An24 | PR C34 1052 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 124 | 1132 | 0.97 ps | 2+ | +0.03(13) |  | CER | 1975Gr30 | PR C12 1462 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 125 | 0 | 9.62 d | 11/2- | +0.2(2) | B | ABLFS | 2005Le34 | PR C72 034305 |
|  |  | 28 | 9.5 m | 3/2+ | +0.86(8) | B | ABLFS | 2004Le13 | NP A734 437 (2004) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 126 | 1141 | 1.0 ps | 2+ | 0.0(2) |  | CER | 2011Al35 | PR C84 1303 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 127 | 0 | 2.1 h | 11/2- | +0.32(14) | B | ABLFS | 2005Le34 | PR C72 034305 |
|  |  | 5 | 4.13 m | 3/2+ | +0.65(7) | B | ABLFS | 2004Le13 | NP A734 437 (2004) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 128 | 2492 | 2.7 µs | 10+ | -0.1(3) |  | CER | 2011Al35 | PR C84 1303 (2011) |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 129 | 0 | 2.23 m | 3/2+ | +0.05(12) | B | ABLFS | 2004Le13 | NP A734 437 (2004) |
|  |  | 35 | 6.9 m | 11/2- | -0.20(19) | B | ABLFS | 2005Le34 | PR C72 034305 |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 130 | 1947 | 1.7 m | 7- | -0.39(12) | B | ABLFS | 2005Le34 | PR C72 034305 |
|  |  |  |  |  |  |  |  |  |  |
|  | 50 Sn 131 | 0 | 56 s | 3/2+ | -0.04(9) | B | ABLFS | 2004Le13 | NP A734 437 (2004) |
|  |  | 242 | 58.4 s | 11/2- | 0.0(2) | B | ABLFS | 2005Le34 | PR C72 034305 |
|  |  |  |  |  |  |  |  |  |  |
| **Antimony** | *Calculated efg's in SbN, SbP, SbF and SbCl molecues* | | | |  |  |  | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 112 | 796 | 536 ns | 8- | 1.06(2) | [121Sb] | TDPAD | 1982Ma29 | PR C26 493 (1982) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 114 | 496 | 219 ms | 8- | 1.02(16) | [121Sb] | QIR,R | 1982Ma29 | PR C26 493 (1982) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 115 | 2796 | 152 ns | 19/2- | 0.79(4) | [121Sb] | TDPAD | 1983Se04 | ZP A309 349 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 116 | 1844 | 11.9 ns | 7+ | 2.5(6) | [121Sb] | TDPAD(ampl) | 1992Io01 | ZP A343 21 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 117 | 0 | 2.80 h | 5/2+ | 0.2(12) | [121Sb] | AB | 1974Ek01 | NP A226 219 (1974) |
|  |  | 3131 | 340 ms | (25/2)+ | 1.14(5) | [121Sb] | QIR,R | 1982Ma29 | PR C26 493 (1982)/JPhys G3 713 (1977 |
|  |  | 3231 | 290 ns | 23/2- | 3.7(4) | [121Sb] | TDPAD | 1988Io01 | PL B 200 259 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 118 | 51 | 20.6 ms | (3)+ | 0.9(2) | [121Sb] | TDPAD | 1982Ma29 | PR C26 493 (1982) |
|  |  | 270 | 13.4 ns | 3- | 0.39(8) | [121Sb] | TDPAD(ampl) | 1985Di07 | ZP A320 613 (1985) |
|  |  | 927 | 22.8 ns | 7+ | 2.6(5) | [121Sb] | TDPAD(ampl) | 1988Io01 | PL B 200 259 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 119 | 2554 | 128 ns | 19/2- | 3.18(13) | [121Sb] | TDPAD | 1991Io02 | NP A531 112 (1991) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 51 Sb 120 | 78 | 247 ns | 3+ | 0.63(2) | [121Sb] | TDPAD | 1982Ma29 | PR C26 493 (1982) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference Isotope* | 51 Sb 121 | 0 | stable | 5/2+ | -0.543(11) |  | O | 2008Py02/1978Bu24 | Mol Phys 106 1965 (2008)/JPC A112 1666 (2008 |
|  |  | 37 | 3.5 ns | 7/2+ | -0.727(16) | [121Sb] | ME | 1970St13 | PL A32 91 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 122 | 0 | 2.68 d | 2- | +1.28(8) | [121Sb] | O | 1960Fe08 | PhMg 5 1309 (1960) |
|  |  | 61 | 1.86 ms | 3+ | 0.63(2) | [121Sb] | TDPAD | 1982Ma29 | PR C26 493 (1982) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference Isotope* | 51 Sb 123 | 0 | stable | 7/2+ | -0.692(14) |  | O | 2008Py02/1978Bu24 | Mol Phys 106 1965 (2008)/JPC A112 1666 (2008 |
|  |  |  |  |  |  |  |  |  |  |
|  | 51 Sb 124 | 0 | 60.2 d | 3- | +2.8(2) | [121Sb] | NO/S | 1985He16 | ZP A322 281 (1985) |
|  |  |  |  |  |  |  |  |  |  |
| **Tellurium** | *There is no adopted reference efg for Te.* | | | |  |  |  |  |  |
|  | *A. Efg in the lased state of the Te atom calculated by semi-empirical methods* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 122 | 564 | 7.52 ps | 2+ | -0.57(5) |  | CER | 1976Bo12 | NP A261 498 A261 |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 124 | 603 | 6.25 ps | 2+ | -0.45(5) |  | CER | 1976Bo12 | NP A261 498 A261 |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 125 | 36 | 1.48 ns | 3/2+ | -0.31(2) | [129I] | ME | 1977La03 | PR B15 2504 |
|  |  | 145 | 58 d | 11/2- | 0.0(2) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  | 321 | 695 ps | 9/2- | 0.12(+5,-9) | [125Te 36 keV] | IPAC | 1976Va28 | HFI 2 321 (1976) |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 126 | 666 | 4.41 ps | 2+ | -0.23(5) |  | CER | 1976Bo12 | NP A261 498 A261 |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 127 | 88 | 109 d | 11/2- | 0.17(12) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 128 | 743 | 3.2 ps | 2+ | -0.22(5) |  | CER | 1976Bo12 | NP A261 498 A261 |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 129 | 0 | 69.5 m | 3/2+ | 0.055(13) | [129I] | NO/ME | 1987Be36 | HFI 35 1023 (1987) |
|  |  | 106 | 33.5 d | 11/2- | 0.40(3) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 130 | 840 | 2.3 ps | 2+ | -0.12(5) |  | CER | 1976Bo12 | NP A261 498 A261 |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 131 | 182 | 30 h | 11/2- | 0.25(14) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 133 | 0 | 12.5 m | 3/2+ | 0.23(9) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  | 334 | 55.4 m | 11/2- | 0.28(14) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 52 Te 135 | 0 | 19 s | 7/2- | 0.29(9) | A | CLS | 2006Si40 | HFI 171 173 (2006) |
|  |  |  |  |  |  |  |  |  |  |
| **Iodine** | *Calculated efg's in atomic I and HI* | | |  |  |  |  | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 53 I 125 | 0 | 60.2 d | 5/2+ | -0.761(17) | [127I] | MA | 1958Fl39 | PR 110 536 (1958) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 53 I 127 | 0 | stable | 5/2+ | -0.696(12) |  | AB | 1976Fu06 | JPCR 5 835 (1976) |
|  |  | 58 | 1.95 ns | 7/2+ | -0.624(11) | [127I] | ME | 1964Pe15 | PL 13 198 (1964) |
|  |  |  |  |  |  |  |  |  |  |
|  | 53 I 129 | 0 | 1.6x10\*7 y | 7/2+ | -0.488(8) | [127I] | Q,MA | 1953Li16 | PR 90 609 (1953) |
|  |  | 28 | 16.8 ns | 5/2+ | -0.604(10) | [127I] | ME | 1972Ro41 | NIM 105 509 (1972) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 53 I 131 | 0 | 8.04 d | 7/2+ | -0.34(2) | [127I] | AB | 1960Li13 | PR 119 2022 (1960) |
|  |  | 1797 | 5.9 ns | (15/2)- | 0.66(6) | [129I 28 keV] | TDPAC | 1973Ha61 | JCP 58 3339 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 53 I 132 | 0 | 2.28 h | 4+ | 0.08(1) | [127I] | AB | 1960Wh06 | BAPS 5 504 (1960) |
|  |  | 50 | 1.12 ns | 3+ | 0.20(6) | [129I] | IPAC | 1979Oo01 | NP A321 180 (1979) |
|  |  | 278 | 1.42 ns | 1+ | -0.150(5) | [129I] | TDPAC | 1979Oo01 | NP A321 180 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 53 I 133 | 0 | 20.9 h | 7/2+ | -0.23(1) | [127I] | AB | 1961Al20 | UCRL 9850 (1960) |
|  |  |  |  |  |  |  |  |  |  |
| **Xenon** | *Calculated efg in XeH+ and XeD+* except for *(a) estimated Q of this state giving efg at Xe in Cd metal* | | | | | |  |  |  |
|  | *A - Q estimated from B(E2)* | | |  |  |  |  |  |  |
|  | *B - Efg estimated from systematics in Te metal* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 117 | 0 | 1.02 m | 5/2+ | +1.14((4) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 119 | 0 | 5.8 m | 5/2+ | +1.29(5) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 121 | 0 | 39 m | 5/2+ | +1.31(5) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 123 | 180+x | 5.2 ms | 7/2(-) | 1.4(3) | [125Xe 296 keV] | TDPAD | 1982Ze05 | ZP A308 227 (1982) |
|  |  | 201 + x | 17 ns | 9/2- | 1.1(6) | [125Xe 296 keV] | TDPAD(ampl) | 1982Ze05 | ZP A308 227 (1982) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 125 | 253 | 57 s | 9/2- | +0.417(15) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  | 296 | 140 ns | 7/2+ | 1.40(15) (a) | A | not measured | 1982Ze05 | ZP A308 227 (1982) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 127 | 297 | 1.15 m | 9/2- | +0.68(2) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 129 | 40 | 0.98 ns | 3/2+ | -0.393(10) | [131Xe] | ME | 1964Pe06 | PR 135B 1102 (1964) |
|  |  | 236 | 8.89 d | 11/2- | +0.63(2) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 54 Xe 131 | 0 | stable | 3/2+ | -0.114(1) |  | CLS | 1989Bo03 | PL B216 7 (1989) |
|  |  | 164 | 11.8 d | 11/2- | +0.72(3) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 132 | 2214 | 90 ns | 7- | 0.010(5) | B | TDPAD | 1987Le31 | UkrF 32 1636 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 133 | 0 | 5.24 d | 3/2+ | +0.140(5) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  | 233 | 2.19 d | 11/2- | +0.76(5) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 135 | 0 | 9.10 h | 3/2+ | +0.210(7) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  | 527 | 15.3 m | 11/2- | +0.61(2) | [131Xe] | CLS | 1990NeZY | PC Neugart (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 137 | 0 | 3.82 m | 7/2- | -0.47(2) | [131Xe] | CLS | 1989Bo03 | PL B216 7 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 139 | 0 | 39.7 s | 3/2- | +0.39(2) | [131Xe] | CLS | 1989Bo03 | PL B216 7 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 141 | 0 | 1.73 s | 5/2+ | -0.57(2) | [131Xe] | CLS | 1989Bo03 | PL B216 7 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 54 Xe 143 | 0 | 0.30 s | 5/2- | +0.91(3) | [131Xe] | CLS | 1989Bo03 | PL B216 7 (1989) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| **Caesium** | *Calculated efg in CsF molecule.* | | |  |  |  |  | 2008Py02 | Mol Phys 106 1965 (2008) |
|  | *A - estimated efg at Cs in Ga metal* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 118 | (0) | 14 s | 2 | +1.31(17) | [133Cs] | ABLS | 1987Co19 | NP A468 1 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 119 | (0) | 36 s | 9/2+ | +2.65(17) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  | (0) | 28 s | 3/2+ | +0.85(12) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 120 | 0 | 64 s | 2+ | +1.36(7) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 121 | 0 | 2.27 m | 3/2+ | +0.79(4) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  | ~36 | 2.02 m | 9/2+ | +2.53(13) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 122 | (0) | 21 s | 1+ | -0.179(10) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  | (0) | 4.2 m | 8- | +3.09(8) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 124 | 0 | 30.8 s | 1+ | -0.69(4) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 126 | 0 | 1.64 m | 1+ | -0.64(3) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 127 | 66 | 24.9 ns | 5/2(+) | 0.58(12) | A | TDPAC | 1999Co22 | NIM B152 357 (1999) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 128 | 0 | 3.62 m | 1+ | -0.54(3) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 130 | 0 | 29.9 m | 1+ | -0.056(6) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  | 0+x | 3.7 m | 5(-) | +1.36(8) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 131 | 0 | 9.69 d | 5/2+ | +0.59(2) | [133Cs] | ABLS | 1975Ac01 | NP A248 157 (1975) |
|  |  | 134 | 8.7 ns | 5/2+ | 0.20(2) | [133Cs 81 keV] | TDPAC | 2000De13 | Eur Phys J A7 177 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 132 | 0 | 6.47 d | 2(-) | +0.48(2) | [133Cs] | ABLS | 1975Ac01 | NP A248 157 (1975) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 55 Cs 133 | 0 | stable | 7/2+ | -0.00343(10) |  | MB | 1998Pe18 | JCP 47 3896 (1967)/JCP 108 6739 (1998 |
|  |  | 81 | 6.31 ns | 5/2+ | 0.30(2) | [133Cs] | ME | 1977Ca30 | PR B15 3318 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 134 | 0 | 2.06 y | 4+ | +0.37(2) | [133Cs] | ABLS | 1975Ac01 | NP A248 157 (1975) |
|  |  | 139 | 2.90 h | 8- | +0.92(8) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 135 | 0 | 3x10\*6 y | 7/2+ | +0.048(3) | [133Cs] | ABLS | 1975Ac01 | NP A248 157 (1975) |
|  |  | 1633 | 53 m | 19/2- | +0.83(7) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 136 | 0 | 13.2 d | 5+ | +0.213(15) | [133Cs] | ABLS | 1975Ac01 | NP A248 157 (1975) |
|  |  | 0+x | 19 s | 8- | +0.70(3) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 137 | 0 | 30.17 y | 7/2+ | +0.048(2) | [133Cs] | ABLS | 1975Ac01 | NP A248 157 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 138 | 0 | 32.2 m | 3- | +0.112(17) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  | 80 | 2.9 m | 6- | -0.37(5) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 55 Cs 139 | 0 | 9.4 m | 7/2+ | -0.063(14) | [133Cs] | ABLS | 1979Bo01 | ZP A289 227 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 140 | 0 | 65 s | 1- | -0.094(15) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 141 | 0 | 25.1 s | 7/2+ | -0.42(7) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 143 | 0 | 1.78 s | 3/2+ | +0.44(3) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 144 | 0 | 1.00 s | 1 | +0.29(2) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 145 | 0 | 0.59 s | 3/2+ | +0.58(6) | [133Cs] | ABLS | 1981Th06 | NP A367 1 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 55 Cs 146 | 0 | 0.34 s | 1 | +0.21(3) | [133Cs] | ABLS | 1987Co19 | NP A468 1 (1987) |
|  |  |  |  |  |  |  |  |  |  |
| **Barium** | *Efg calculations in the 6p 2P3/2 state of the Ba II spectrum* | | | | |  |  | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 121 | 0 | 30 s | 5/2(+) | +1.96(13) | [135Ba] | CLS | 1988We14 | PL B211 272 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 123 | 0 | 2.7 m | 5/2+ | +1.63(13) | [135Ba] | CLS | 1988We14 | PL B211 272 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 127 | 80 | 1.9 s | 7/2(-) | +1.78(14) | [135Ba] | CLS | 1992Da06 | J Phys G 17 L67 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 129 | 8.4 | 2.16h | 7/2+ | +1.75(14) | [135Ba] | CLS | 1979Be25 | ZP A291 219 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 130 | 357 | 37 ps | 2+ | -1.02(15) or -0.09(15) |  | CER | 1989Bu07 | NP A494 102 (1989) |
|  |  | 2476 | 9.54 ms | 8- | +2.40(6) | [135Ba] | CLS | 2002Mo31 | PL B547 200 (2002) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 131 | 188 | 14.6 m | 9/2- | +1.60(14) | [135Ba] | CLS | 1983Mu12 | NP A403 234 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 133 | 288 | 38.9 h | 11/2- | +0.96(6) | [135Ba] | CLS | 1979Be25 | ZP A291 219 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 134 | 605 | 5.1 ps | 2+ | -0.26(12) or +0.15(12) |  | CER | 1989Bu07 | NP A494 102 (1989) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 56 Ba 135 | 0 | stable | 3/2+ | +0.160(3) |  | CFBLS | 1984We15 | ZP A318 125 (1984) |
|  |  | 268 | 28.7 h | 11/2- | +1.03(15) | [135Ba] | CLS | 1979Be25 | ZP A291 219 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 136 | 819 | 1.93 ps | 2+ | -0.19(6) or +0.07(7) |  | CER | 1986Ro15 | PR C34 732 (1986) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 56 Ba 137 | 0 | stable | 3/2+ | +0.245(4) |  | CFBLS | 1984We15 | ZP A318 125 (1984) |
|  |  | 662 | 2.55 m | 11/2- | +0.85(10) | [135Ba] | CLS | 1983Mu12 | NP A403 234 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 138 | 1436 | 0.206 ps | 2+ | -0.14(6) or +0.08(6) |  | CER | 1989Bu07 | NP A494 102 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 139 | 0 | 84.6 m | 7/2- | -0.573(13) | [135Ba] | CFBLS | 1988We07 | ZP A329 407 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 140 | 602 | 7.2 ps | 2+ | -0.5(3) |  | CER | 2012Ba40 | PR C86 034310 (2012) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 141 | 0 | 18.7 m | 3/2- | +0.454(10) | [135Ba] | CFBLS | 1988We07 | ZP A329 407 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 143 | 0 | 14.5 s | 5/2(+) | -0.88(2) | [135Ba] | CFBLS | 1988We07 | ZP A329 407 (1988) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 56 Ba 145 | 0 | 4.31 s | 5/2(-) | +1.22(2) | [135Ba] | CFBLS | 1988We07 | ZP A329 407 (1988) |
|  |  |  |  |  |  |  |  |  |  |
| **Lanthanum** | *Calculated efg's in La halides* | | |  |  |  |  | 2008Py02 | Mol Phys 106 1965 (2008) |
|  |  |  |  |  |  |  |  |  |  |
|  | 57 La 135 | 0 | 19.5 h | 5/2+ | -0.4(4) | [139La] | CLS | 2003Ii03 | PR C68 054328 (2003) |
|  |  |  |  |  |  |  |  |  |  |
|  | 57 La 137 | 0 | 6 x 10\*4 y | 7/2+ | +0.21(4) | [139La] | CLS | 2003Ii03 | PR C68 054328 (2003) |
|  |  |  |  |  |  |  |  |  |  |
|  | 57 La 138 | 0 | 1.1x10\*11 y | 5+ | +0.39(3) | [139La] | CLS | 2003Ii03 | PR C68 054328 (2003) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 57 La 139 | 0 | stable | 7/2+ | +0.200(6) |  | MB | 2007Ja16 | JCP 127 204303 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 57 La 140 | 0 | 40.3 h | 3- | +0.084(13) | [139La] | NO/S | 1966Bl05 | PR 143 911 (1966) |
|  |  |  |  |  |  |  |  |  |  |
| **Cerium** | *There is no adopted efg calculation for cerium.* | | | |  |  |  |  |  |
|  | A. Normalised to nuclear model estimate of Q 138Cs 3538 keV. | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 129 | 108 | 60 ns | 9/2- | 1.32(13) | A | TDPAD | 1998Io01 | NP A633 459 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 130 | 2454 | 109 ns | 7- | 1.8(2) | A | TDPAD | 1999Io02 | PR C60 024316 (1999) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 131 | 162 | 88 ns | 9/2- | 0.92(10) | A | TDPAD | 1998Io01 | NP A633 459 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 134 | 3209 | 308 ns | 10+ | +1.32(12) | A | TDPAD | 1983Da29 | HFI 15/16 101 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 136 | 3095 | 2.2 ms | 10+ | +1.11(11) | A | TDPAD | 1983Da29 | HFI 15/16 101 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 138 | 3538 | 82 ns | 10+ | estimated +0.77 eb |  | not measured | 1983Da29 | HFI 15/16 101 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 140 | 2084 | 3.4 ns | 4+ | 0.35(7) | [139La] | TDPAC | 1973KlZV | JPJS 34 265 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 58 Ce 142 | 641 | 5.7 ps | 2+ | -0.16(5) or -0.37(5) |  | CER | 1988Ve08/1989Sp07 | PR C38 2982 (1988)/AuJP 42 345 (1989 |
|  |  |  |  |  |  |  |  |  |  |
| **Praseodymium** | *Efg calculated in the Pr ion with estimated Sternheimer correction (1994Il01)* | | | | |  | N.B. Deviation from standard adopted by Pyykko (2008Py02) who gives Q 141Pr -0.059(4) b. | | |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 59 Pr 141 | 0 | stable | 5/2+ | -0.077(6) |  | CLS | 1994Ii01 | PR C50 661 (1994) |
|  |  |  |  |  |  |  |  |  |  |
|  | 59 Pr 142 | 0 | 19.2 h | 2- | 0.039(17) | [141Pr] | AB | 1962Ca10 | PR 126 1004 (1962) |
|  |  |  |  |  |  |  |  |  |  |
|  | 59 Pr 143 | 0 | 13.57 d | 7/2+ | +0.77(16) | [141Pr] | CLS | 1994Ii01 | PR C50 661 (1994) |
|  |  |  |  |  |  |  |  |  |  |
| **Neodymium** | *Efg calculated in the Nd ion with estimated Sternheimer correction* | | | | |  | N.B. Deviation from standard adopted by Pyykko (2008Py02) who gives Q 143Nd -0.63(6) b. | | |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 135 | 0 | 12.4 m | 9/2- | +1.9(5) | [143Nd] | CLS | 1992Le09 | JPhys G18 1177 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 139 | 0 | 30 m | 3/2+ | +0.28(9) | [143Nd] | CLS | 1992Le09 | JPhys G18 1177 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 141 | 0 | 2.49 h | 3/2+ | +0.32(13) | [143Nd] | CLS | 1992Le09 | JPhys G18 1177 (1992) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 60 Nd 143 | 0 | stable | 7/2- | -0.61(2) |  | AB | 1992Au04 | ZP D23 19 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 144 | 697 | 4.51 ps | 2+ | -0.15(6) or -0.28(6) |  | CER | 1989Sp07 | AuJP 42 345 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 145 | 0 | stable | 7/2- | -0.314(12) | [143Nd] | AB | 1992Au04 | ZP D23 19 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 146 | 454 | 27.5 ps | 2+ | -0.78(9) |  | CER | 1970Ge08 | NP A151 252 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 147 | 0 | 11.0 d | 5/2- | +0.9(3) | [143Nd] | AB | 1970PiZR | BAPS 15 769 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 148 | 302 | 78 ps | 2+ | -1.46(13) |  | CER | 1970Ge08 | NP A151 252 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 149 | 0 | 1.73 h | 5/2- | +1.3(3) | [143Nd] | AB | 1970PiZR | BAPS 15 769 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 60 Nd 150 | 130 | 2142 ps | 2+ | -2.0(5) |  | CER | 1970Ge08 | NP A151 252 (1970) |
|  |  |  |  |  |  |  |  |  |  |
| **Promethium** | *Empirical efg estimate in Pm atom* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 61 Pm 145 | 0 | 17.7 y | 5/2+ | +0.23(8) | [147Pm] | CLS | 1992Al03 | JP B25 571 (1992) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 61 Pm 147 | 0 | 2.623 y | 7/2+ | +0.74(20) |  | O | 1966Re04 | PR 141 1123 (1966) |
|  |  |  |  |  |  |  |  |  |  |
|  | 61 Pm 148 | 0 | 5.37 d | 1- | +0.2(2) | [147Pm] | AB | 1963Bu14 | PR 132 723 (1963) |
|  |  |  |  |  |  |  |  |  |  |
|  | 61 Pm 151 | 0 | 28.4 h | 5/2 + | 2.2(9) | [147Pm] | AB | 1963Bu14 | PR 132 723 (1963) |
|  |  |  |  |  |  |  |  |  |  |
| **Samarium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 140 | 3172 | 19.4 ns | 10+ | 1.7(5) | [154Sm 82] | TDPAD | 1985Be23 | ZP A321 403 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 141 | 176 | 22.6 m | 11/2- | +1.6(5) | [147Sm] | CLS | 1992Le09 | JPhys G18 1177 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 142 | 2372 | 170 ns | 7- | +1.1(3) | [154Sm 82] | TDPAD | 1985Be23/1986Da22 | ZP A321 403 (1985)/PL B181 21 (1986 |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 143 | 0 | 8.83 m | 3/2+ | +0.4(2) | [147Sm] | CLS | 1992Le09 | JPhys G18 1177 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 145 | 0 | 340 d | 7/2- | -0.60(7) | [147Sm] | LRFS | 1990En01 | JPhys G16 105 (1990) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 62 Sm 147 | 0 | 1.1x10\*11y | 7/2- | -0.26(3) |  | Mu-X | 2008Py02/1981Ba28 | Mol Phys 106 1965 (2008)/NP A364 446 (1981 |
|  |  | 121 | 0.78 ns | 5/2- | -0.5(2) | [147Sm] | ME | 1971Pa04 | PR C3 841 (1971) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 148 | 550 | 7.3 ps | 2+ | -1.0(3) |  | CER | 1989Ra17 | JPJS 34 443 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 149 | 0 | > 2x10\*15 y | 7/2- | +0.078(8) | [147Sm] | AB | 1972Ch55/1992Le09 | PR A6 2011 (1972)/JPhys G18 1177 (1992 |
|  |  | 23 | 7.6 ns | 5/2- | +1.01(9) | [147Sm] | Mu-X | 1981Ba28 | NP A364 446 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 150 | 334 | 49 ps | 2+ | -1.3(2) |  | CER | 1973Gr06 | PRL 30 453 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 151 | 0 | 90 y | 5/2- | +0.71(7) | [147Sm] | LRFS | 1990En01 | JPhys G16 105 (1990) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 62 Sm 152 | 122 | 1.40 ns | 2+ | -1.666(16) |  | Mu-X | 1979Po05 | NP A316 295 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 153 | 0 | 46.8 h | 3/2+ | +1.30(12) | [147Sm] | LRFS | 1990En01 | JPhys G16 105 (1990) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 62 Sm 154 | 82 | 3.01 ns | 2+ | -1.87(4) |  | Mu-X | 1979Po05 | NP A316 295 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 62 Sm 155 | 0 | 22.4 m | 3/2- | 1.13(13) | [147Sm] | AB | 1976Fu06 | JPCR 5 835 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| **Europium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 140 | 0 + x | 1.54 s | 1(+) | +0.31(4) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 141 | 0 | 40 s | 5/2+ | +0.85(4) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 142 | 0 | 2.4 s | 1+ | +0.12(5) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  | 180 | 73 s | 8- | +1.41(6) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 143 | 0 | 2.6 m | 5/2+ | +0.51(3) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 144 | 0 | 10 s | 1+ | +0.10(3) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 145 | 0 | 5.93 d | 5/2+ | +0.29(2) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 146 | 0 | 4.59 d | 4- | -0.18(6) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 147 | 0 | 24.1 d | 5/2+ | +0.55(3) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 148 | 0 | 54.5 d | 5- | +0.35(6) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 149 | 0 | 93.1 d | 5/2+ | +0.75(2) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 150 | 0 | 35.8 y | 5(-) | +1.13(5) | [153Eu] | CLS | 1985Ah02 | ZP A321 35 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 151 | 0 | stable | 5/2+ | +0.903(10) | [153Eu] | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  | 22 | 9.5 ns | 7/2+ | +1.28(2) |  | Mu-X | 1984Ta05 | PR C29 1897 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 152 | 0 | 13.54 y | 3- | +2.72(3) | [153Eu] | CLS | 1986Al33 | YadF 44 1134 (1986) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 63 Eu 153 | 0 | stable | 5/2+ | +2.41(2) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  | 83 | 0.80 ns | 7/2+ | +0.44(2) |  | Mu-X | 1984Ta05 | PR C29 1897 (1984) |
|  |  | 103 | 3.9 ns | 3/2+ | +1.253(12) | [153Eu] | ME | 1973Ar19 | PL A44 279 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 154 | 0 | 8.6 y | 3- | +2.85(10) | [153Eu] | CLS | 1986Al33 | YadF 44 1134 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 155 | 0 | 4.68 y | 5/2+ | +2.5(3) | [153Eu] | CLS | 1990Al34 | ZP A337 257 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 157 | 0 | 15.2 h | 5/2+ | +2.6(3) | [153Eu] | CLS | 1990Al34 | ZP A337 257 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 158 | 0 | 45.9 m | 1(-) | +0.66(14) | [153Eu] | CLS | 1990Al34 | ZP A337 257 (1990) |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 63 Eu 159 | 0 | 18.1 m | 5/2+ | +2.7(3) | [153Eu] | CLS | 1990Al34 | ZP A337 257 (1990) |
|  |  |  |  |  |  |  |  |  |  |
| **Gadolinium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 144 | 3433 | 130 ns | 10+ | -1.40(6) | [155Gd] | TDPAD | 1982Ha20/1985Da20 | NP A379 287 (1982)/NP A443 135 (1985 |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 147 | 997 | 22.2 ns | 13/2+ | -0.70(8) | [155Gd] | TDPAD | 1982Ha20/1985Da20 | NP A379 287 (1982)/NP A443 135 (1985 |
|  |  | 3582 | 27 ns | 27/2- | -1.21(9) | [155Gd] | TDPAD | 1982Ha20/1985Da20 | NP A379 287 (1982)/NP A443 135 (1985 |
|  |  | 8587 | 510 ns | 49/2+ | -3.00(18) | [155Gd] | TDPAD | 1982Ha20/1985Da20 | NP A379 287 (1982)/NP A443 135 (1985 |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 148 | 2695 | 16.5 ns | 9- | 0.96(5) | [155Gd] | TDPAD | 1982Ha20 | NP A379 287 (1982) |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 154 | 123 | 1.17 ns | 2+ | -1.82(4) |  | Mu-X | 1983La08 | PR C27 1772 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 64 Gd 155 | 0 | stable | 3/2- | +1.27(3) |  | Mu-X | 1983La08 | PR C27 1772 (1983) |
|  |  | 87 | 6.35 ns | 5/2+ | +0.110(8) | [155Gd] | ME | 1974Ar23 | NP A233 385 (1974) |
|  |  | 105 | 1.18 ns | 3/2+ | +1.27(5) | [155Gd] | ME | 1974Ar23 | NP A233 385 (1974) |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 156 | 89 | 2.21 ns | 2+ | -1.93(4) |  | Mu-X | 1983La08 | PR C27 1772 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 64 Gd 157 | 0 | stable | 3/2- | +1.35(3) |  | Mu-X | 1983La08 | PR C27 1772 (1983) |
|  |  | 64 | 0.46 ms | 5/2+ | +2.43(7) | [157Gd] | ME | 1974Ar23 | NP A233 385 (74) |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 158 | 80 | 2.52 ns | 2+ | -2.01(4) |  | Mu-X | 1983La08 | PR C27 1772 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 64 Gd 160 | 75 | 2.70 ns | 2+ | -2.08(4) |  | Mu-X | 1983La08 | PR C27 1772 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| **Terbium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  | *A. Efg estimate at Tb in yttrium ethylsuphate* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 148 | 0 | 60 m | 2- | -0.3(2) | [159Tb] | CLS | 1990Al36 | ZP A337 367 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 150 | 0 + x | 3.48 h | 2(-) | 0.00(13) | [159Tb] | CLS | 1990Al36 | ZP A337 367 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 152 | 0 | 17.5 h | 2- | +0.34(13) | [159Tb] | CLS | 1990Al36 | ZP A337 367 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 153 | 0 | 2.34 d | 5/2+ | +1.08(14) | [159Tb] | CLS | 1990Al36 | ZP A337 367 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 154 | 0 + x | 9.4 h | 3- | +2.4(13) | [159Tb] | NO/S | 1983Be03 | JPhys G9 213 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 155 | 0 | 5.32 d | 3/2+ | +1.41(6) | [159Tb] | CLS | 1990Al36 | ZP A337 367 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 156 | 0 | 5.35 d | 3- | +2.3(8) | [159Tb] | NO/S | 1979Ri17/1983Be03 | CzJP B29 620 (1979)/JPhys G9 213 (1983 |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 157 | 0 | 99 y | 3/2+ | +1.40(8) | [159Tb] | CLS | 1990Al36 | ZP A337 367 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 158 | 0 | 150 y | 3- | +2.7(5) | A | EPR/NO/S | 1968Ea04 | PR 170 1083 (1968) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 65 Tb 159 | 0 | stable | 3/2+ | +1.432(8) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 160 | 0 | 72.1 d | 3- | +3.85(5) | [159Tb] | NMR/ON | 1987Ma42 | PRL 59 1764 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 65 Tb 161 | 0 | 6.9 d | 3/2+ | +1.3(6) | [159Tb] | NO/S | 1983Ri15 | HFI 15 83 (1(83) |
|  |  |  |  |  |  |  |  |  |  |
| **Dysprosium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  | *A. Unpublished results from Neugart, PC to Raghavan (1987). No information on interaction analysis.* | | | | | |  |  |  |
|  | *B. Analysis of perturbation of TDPAC in liquid sources* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 147 | 751 | 59 s | (11/2-) | +0.67(10) | A | CLS | 1989Ra17 | ADNDT 42 189 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 149 | 0 | 4.23 m | 7/2- | -0.62(5) | A | CLS | 1989Ra17 | ADNDT 42 189 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 151 | 0 | 17 m | 7/2- | -0.30(5) | A | CLS | 1989Ra17 | ADNDT 42 189 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 153 | 0 | 6.3 h | 7/2- | -0.15(9) | [163Dy] | AB | 1973Ek01 | PS 7 31 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 155 | 0 | 10.0 h | 3/2- | +0.96(2) | [163Dy] | AB | 1973Ek01 | PS 7 31 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 157 | 0 | 8.1 h | 3/2- | +1.29(2) | [163Dy] | AB | 1973Ek01 | PS 7 31 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 159 | 0 | 144 d | 3/2- | +1.37(2) | A | CLS | 1989Ra17 | ADNDT 42 189 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 160 | 87 | 1.96 ns | 2+ | 1.8(4) | B | TDPAC | 1970Wa25 | ZP A238 35 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 161 | 0 | stable | 5/2+ | +2.51(2) | [163Dy] | AB | 1974Fe05 | PL A49 287 (1974) |
|  |  | 26 | 29 ns | 5/2- | +2.51(2) | [161Dy] | ME | 1973St23 | JPCR 5 1093 (1973) |
|  |  | 44 | 0.78 ns | 7/2+ | +0.53(13) | [161Dy] | ME | 1973Sy01 | PR C7 2056 (1973) |
|  |  | 75 | 3.2 ns | 3/2- | +1.45(6) | [161Dy] | ME | 1973St23 | JPCR 5 1093 (1973) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 66 Dy 163 | 0 | stable | 5/2- | +2.65(2) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 164 | 73 | 2.39 ns | 2+ | -2.08(15) | [161Dy] | ME | 1968Mu01 | ZP A208 184 (1968) |
|  |  |  |  |  |  |  |  |  |  |
|  | 66 Dy 165 | 0 | 2.33 h | 7/2+ | +3.48(7) | [161Dy] | AB | 1968 Ra03 | PR 165 1360 (1968) |
|  |  |  |  |  |  |  |  |  |  |
| **Holmium** | *Pionic atom X-ray hyperfine structure* | | |  | n |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 152 | 0 | 161.8 s | 2- | +0.1(2) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  | 160 | 49.5 s | 9+ | -1.3(8) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 153 | 0 | 2.0 m | 11/2- | -1.1(5) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 154 | 0 | 11.76 m | 2- | +0.19(10) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  | 320 | 3.10 m | 8+ | -1.0(5) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 155 | 0 | 48 m | 5/2+ | +1.56(12) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 156 | 0 | 56 m | 4(+) | +2.40(18) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 67 Ho 157 | 0 | 12.6 m | 7/2- | +3.05(13) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 158 | 0 | 11.3 m | 5+ | +4.2(4) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  | 67.2 | 28 m | 2- | +1.66(17) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 159 | 0 | 35.05 m | 7/2- | +3.27(13) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 160 | 0 | 25.6 m | 5+ | +4.0(2) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  | 60 | 5.02 h | 2- | +1.83(17) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 161 | 0 | 2.48 h | 7/2- | +3.30(11) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 162 | 106 | 67 m | 6- | +4.0(7) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 67 Ho 163 | 0 | 4570 y | 7/2- | +3.7(6) | [165Ho] | LRIS | 1989Al27 | NP A504 549 (1989) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 67 Ho 165 | 0 | stable | 7/2- | +3.58(2) |  | Pi-X | 1983Ol03 | NP A403 572 (1983) |
|  |  | 95 | 22 ps | 9/2- | +3.52(4) | [165Ho] | Mu-X | 1976Po05 | NP A262 493 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| **Erbium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  | *A - Estimated efg in Er metal.* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 153 | 0 | 37.1 s | (7/2-) | -0.42(2) | [167Er] | CLS | 1987OtZW | CERN EP 87/51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 155 | 0 | 5.3 m | 7/2- | -0.27(2) | [167Er] | CLS | 1987OtZW | CERN EP 87/51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 157 | 0 | 25 m | 3/2- | +0.92(1) | [167Er] | CLS | 1987OtZW | CERN EP 87/51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 159 | 0 | 36 m | 3/2- | +1.17(1) | [167Er] | CLS | 1987OtZW | CERN EP 87/51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 161 | 0 | 3.21 h | 3/2- | +1.363(8) | [167Er] | AB | 1972Ek03 | NP A194 237 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 162 | 102 | 1.3 ns | 2+ | <0 |  | CER | 1981Hu02 | PR C23 240 (1981) |
|  |  | 901 | 1.24 ps | 2+ | 1.8(6) |  | CER | 1983Hu01 | PR C27 550 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 163 | 0 | 75.1 m | 5/2- | +2.56(2) | [167Er] | CLS | 1987OtZW | CERN EP 87/51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 164 | 92 | 1.48 ns | 2+ | <0 |  | CER | 1981Hu02 | PR C23 240 (1981) |
|  |  | 860 | 1.9 ps | 2+ | 2.4(3) |  | CER | 1983Hu01 | PR C27 550 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 165 | 0 | 10.36 h | 5/2- | +2.71(3) | [167Er] | CLS | 1987OtZW | CERN EP 87/51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 166 | 81 | 1.85 ns | 2+ | -1.9(4) | A | ME | 1965Hu01 | ZP 182 499 (1965) |
|  |  | 265 | 118 ps | 4+ | -2.7(9) |  | CER | 1970McZQ | ORNL 4513 56 (1970) |
|  |  | 786 | 4.6 ps | 2+ | 2.2(3) |  | CER | 1983Hu01 | PR C27 550 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| Reference isotope | 68 Er 167 | 0 | stable | 7/2+ | +3.57(3) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 168 | 264 | 121 ps | 4+ | -2.2(10) |  | CER | 1970McZQ | ORNL 4513 56 (1970) |
|  |  | 821 | 2.9 ps | 2+ | 2.3(2) |  | CER | 1983Hu01 | PR C27 550 (1983) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 170 | 79 | 1.90 ns | 2+ | -1.9(2) |  | CER | 1973Lu02 | PR C8 391 (1973) |
|  |  | 260 | ~135 ps | 4+ | -2.2(10) |  | CER | 1970McZQ | ORNL 4513 56 (1970) |
|  |  | 932 |  | 2+ | 2.0(3) |  | CER | 1983Hu01 | PR C27 550 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 68 Er 171 | 0 | 7.52 h | 5/2- | 2.86(9) | [167Er] | AB | 1964Bu09 | PR 135 B1281 (1964) |
|  |  |  |  |  |  |  |  |  |  |
| **Thulium** | *There is no adopted reference efg for Tm.* | | | |  |  |  |  |  |
|  | *A. For details of the efg used see 1973Ek01/1988Al04* | | | |  |  |  |  |  |
|  | *B. Includes estimated Sternheimer correction* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 153 | 0 | 1.48 s | (11/2-) | +0.5(10) | [169Tm] | LRIS | 2000Ba16 | PR C61 034304 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 154 | 0 | 8.1 s | (2-) | +0.4(9) | A | LRIS | 2000Ba16 | PR C61 034304 (2000) |
|  |  | 0 + x | 3.30 s | (9+) | -0.2(4) | A | LRIS | 2000Ba16 | PR C61 034304 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 156 | 0 | 1.3 m | 2- | -0.48(11) | A | LRIS | 1987AlZb | LIYAF 1309 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 158 | 0 | 4.3 m | 2- | +0.74(11) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 159 | 0 | 9.0 m | 5/2+ | +1.93(7) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 160 | 0 | 9.4 m | 1- | +0.58(4) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 161 | 0 | 38 m | 7/2+ | +2.90(7) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 162 | 0 | 21 m | 1- | +0.69(3) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 164 | 0 | 2.0 m | 1+ | +0.71(5) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 166 | 0 | 7.7 h | 2+ | +2.14(3) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 168 | 0 | 85 d | 3+ | +3.23(7) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 169 | 8 | 3.9 ns | 3/2+ | -1.2(1) | B | ME | 1964Co08 | PR 134 A94 (1964) |
|  |  |  |  |  |  |  |  |  |  |
|  | 69 Tm 170 | 0 | 128.6 d | 1+ | +0.74(2) | A | LRIS | 1988Al04 | NP A477 37 (1988) |
|  |  |  |  |  |  |  |  |  |  |
| **Ytterbium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  | *A. Assumes relation Q(spectroscopic) = 2Q(intrinsic)/7 and Q(intrinsic) 2+ (84 keV) 170Yb = 7.63(9) b* | | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 155 | 0 | 1.59 s | (7/2-) | -0.5(3) | [173Yb] | LRIS | 2000Ba16 | PR C61 034304 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 159 | 0 | 1.58 m | 5/2(-) | -0.22(2) | [173Yb] | CLS | 1983Ne13 | HFI 15 181 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 161 | 0 | 4.2 m | 3/2- | +1.03(2) | [173Yb] | CLS | 1983Ne13 | HFI 15 181 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 163 | 0 | 11.0 m | 3/2- | +1.24(2) | [173Yb] | CLS | 1983Ne13 | HFI 15 181 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 165 | 0 | 9.9 m | 5/2- | +2.48(4) | [173Yb] | CLS | 1983Ne13 | HFI 15 181 (1983) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 167 | 0 | 17.5 m | 5/2- | +2.70(4) | [173Yb] | CLS | 1983Ne13 | HFI 15 181 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 169 | 0 | 32.0 d | 7/2+ | +3.54(6) | [173Yb] | CLS | 1983Ne13 | HFI 15 181 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 170 | 84 | 1.57 ns | 2+ | -2.18(3) | A |  | 2001Ra27 | ADNDT 78 1 (2001) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 171 | 67 | 0.81 ns | 3/2- | -2.34(7) | [170Yb 84 keV] | ME | 1971Pl03 | NP A165 97 (1971) |
|  |  | 76 | 1.64 ns | 5/2- | -2.22(7) | [170Yb 84 keV] | ME | 1971Pl03 | NP A165 97 (1971) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 172 | 79 | 1.6 ns | 2+ | -2.22(4) | [170Yb 84 keV] | ME | 1971Pl03 | NP A165 97 (1971) |
|  |  | 260 | 0.122 ns | 4+ | -2.3(12) |  | CER | 1970McZQ | ORNL-4513 56 (1970) |
|  |  | 1172 | 7.8 ns | 3+ | -2.9(3) | [170Yb 84 keV] | TDPAC | 1970Wa25 | ZP A238 35 (1970) |
|  |  | 1757 | - | (1-) | -3.44(10) |  | Mu-X | 1979Ho23 | PR C20 1934 (1979) |
|  |  | 1822 | - | (3-) | +1.97(10) |  | Mu-X | 1979Ho23 | PR C20 1934 (1979) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 70 Yb 173 | 0 | stable | 5/2- | +2.80(4) |  | Mu-X | 1975Ze04 | NP A254 315 (1975( |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 174 | 77 | 1.79 ns | 2+ | -2.18(5) | [170Yb 84 keV] | ME | 1971Pl03 | NP A165 97 (1971) |
|  |  | 253 | 144 ps | 4+ | -1.8(12) |  | CER | 1970McZQ | ORNL-4513 56 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 175 | 0 | 4.19 d | 7/2- | +3.52(5) | [173Yb] | CLS | 2012Fl05 | JPhys G39 125101 (2012) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 176 | 82 | 1.8 ns | 2+ | -2.28(6) | [170Yb 84 keV] | ME | 1967Ec01 | PR 156 246 (1967) |
|  |  | 272 | 0.11 ns | 4+ | -0.9(12) |  | CER | 1970McZQ | ORNL-4513 56 (1970) |
|  |  | 1050 | 11.4 s | 8- | +5.30(8) | [173Yb] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 70 Yb 177 | 0 | 1.91 h | 9/2+ | +4.03(6) | [173Yb] | CLS | 2012Fl05 | JPhys G39 125101 (2012) |
|  |  |  |  |  |  |  |  |  |  |
| **Lutetium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 162 | 0 | 1.37 m | 1- | +0.519(8) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 164 | 0 | 3.14 m | 1- | +0.608(7) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 166 | 0 | 2.65 m | 6- | +4.33(4) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  | 34 | 1.41 m | 3- | +2.72(2) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 167 | 0 | 51.5 m | 7/2+ | +3.28(2) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 168 | 0 | 5.5 m | 6- | +4.77(6) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  | 220 | 6.7 m | 3+ | +2.43(2) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 169 | 0 | 34.1 h | 7/2+ | +3.48(3) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 171 | 0 | 8.24 d | 7/2+ | +3.53(3) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 172 | 0 | 6.70 d | 4- | +3.80(4) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  | 42 | 3.7 m | 1- | +0.76(3) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  | 71 Lu 173 | 0 | 1.37 y | 7/2+ | +3.53(2) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 174 | 0 | 3.3 y | 1- | +0.773(7) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  | 171 | 142 d | 6- | +4.80(5) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 71 Lu 175 | 0 | stable | 7/2+ | +3.49(2) |  | Mu-X | 1979De29 | NP A326 418 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 176 | 0 | 3.6x10\*10 y | 7- | +4.92(3) | [175Lu] | A | 1985Br09 | NP A440 407 (1985) |
|  |  | 127 | 3.68 h | 1- | -1.450(12) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 177 | 0 | 6.71 d | 7/2+ | +3.39(3) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  | 970 | 160 d | 23/2 | +5.71(5) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 178 | 0 | 28.4 m | 1+ | +0.708(10) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  | 120 | 23.1 m | 9- | +5.39(10) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
|  | 71 Lu 179 | 0 | 4.59 h | 7/2+ | +3.32(3) | [175Lu] | CLS | 1998Ge13 | Eur Phys J A3 225 (1998) |
|  |  |  |  |  |  |  |  |  |  |
| **Hafnium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 72 Hf 171 | 0 | 12.1 h | 7/2+ | +3.46(3) | [177Hf] | CLS | 2000Ye02 | J Phys G26 839 (2000) |
|  |  |  |  |  |  |  |  |  |  |
|  | 72 Hf 175 | 0 | 70 d | 5/2- | +2.72(2) | [177Hf] | CLS | 2002Ni12 | PRL 88 094801 (2002) |
|  |  |  |  |  |  |  |  |  |  |
|  | 72 Hf 176 | 88 | 1.47 ns | 2+ | -2.10(2) | [177Hf] | Mu-X | 1984Ta10 | PR C30 350 (1984) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 72 Hf 177 | 0 | stable | 7/2- | +3.37(3) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  |  | 490 ps | 9/2- | +1.30(2) | [177Hf] | Mu-X | 1984Ta10 | PR C30 350 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 72 Hf 178 | 93 | 1.47 ns | 2+ | -2.02(2) | [177Hf] | Mu-X | 1984Ta10 | PR C30 350 (1984) |
|  |  | 1147 | 4 s | 23/2- | +4.99(4) | [177Hf] | CLS | 2007Bi14 | PL B645 330 (2007) |
|  |  | 2446 | 31 y | 16+ | +6.00(7) | [177Hf] | CLS | 1994Bo15 | PRL 72 2689 (1994) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 72 Hf 179 | 0 | stable | 9/2+ | +3.79(3) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  | 123 | 37 ps | 11/2+ | +1.88(3) | [177Hf] | Mu-X | 1984Ta10 | PR C30 350 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 72 Hf 180 | 93 | 1.53 ns | 2+ | -2.00(2) | [177Hf] | Mu-X | 1984Ta10 | PR C30 350 (1984) |
|  |  | 1142 | 5.5 h | 8- | +4.6(3) | [177Hf] | NO/S | 1973Ka31 | PL B46 62 (1973) |
|  |  |  |  |  |  |  |  |  |  |
| **Tantalum** | *Pionic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 171 | 184 | 45 ns | 9/2- | (+)3.1(2) | [181Ta] | TDPAD | 1995Do32 | HFI 96 223 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 173 | 0 | 3.14 h | 5/2- | -1.8(2) | [181Ta] | NO/S | 1983Ed01 | PL B133 44 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 175 | 0 | 10.5 h | 7/2+ | +3.5(3) | [181Ta] | NO/S | 1983Ed01 | PL B133 44 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 178 | 0 + x | 9.3 m | 1+ | +0.63(6) | [181Ta] | NO/S | 1983Ha49 | HFI 15 105 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 179 | 0 | 1.82 y | 7/2+ | +3.27(4) | [181Ta] | CLS | 1996Wa02 | PR C53 611 (1996) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 180 | 75 | >1.2x10\*15y | 9- | +4.80(3) | [181Ta] | CLS | 1994Wa34 | PR C50 4639 (1994) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 73 Ta 181 | 0 | stable | 7/2+ | +3.17(2) |  | Pi-X | 1983Ol03 | NP A 403 572 (1983) |
|  |  | 6 | 6.05 ms | 9/2- | +3.59(2) | [181Ta] | ME | 1983Ei02 | PL A93 259 (1983) |
|  |  | 482 | 10.8 ns | 5/2+ | +2.28(2) | [181Ta] | ME | 1983Bu11 | PL A97 217 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 73 Ta 182 | 0 | 115 d | 3- | +2.6(3) | [181Ta] | NO/S | 1991Fa12 | PL A159 421 (1991) |
|  |  |  |  |  |  |  |  |  |  |
| **Tungsten** | *There is no adopted reference efg for W* | | | |  |  |  |  |  |
|  | *A. Efg calculation in Tl metal* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 176 | 3746 | 41 ns | 14+ | 6.0(8) | A | TDPAD | 2002Io01 | PL B541 219 (2002) |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 179 | 3348 | 750 ns | 35/2- | +3.9(10) | A | LEMS | 2001Ba04 | PRL 86 604 (2001) |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 180 | 104 | 1.22 ns | 2+ | -2.1(4) | [182W 100 keV] | ME | 1973Zi02 | ZP 262 413 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 182 | 100 | 1.37 ns | 2+ | -2.1(4) |  | CER | 1977RuZV | BAPS 22 1032 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 183 | 47 | 184 ps | 3/2- | -1.8(4) | [182W 100 keV] | ME | 1966Sh07 | JPSJ 21 829 (1966) |
|  |  | 99 | 0.71 ns | 5/2- | -2.0(3) | [182W 100 keV] | ME | 1967Ag02/1974Ge17 | PR 155 1342 (1967)/ZP 267 61 (1974 |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 184 | 111 | 1.25 ns | 2+ | -1.9(2) | [182W 100 keV] | CER | 1974Ge17/1977RuZV | ZP 267 61 (1974)/BAPS 22 1032 (1977 |
|  |  | 904 | 1.73 ps | 2+ | +0.1(4) |  | CER | 1977Ob02 | NP A291 510 (1977) |
|  |  |  |  |  |  |  |  |  |  |
|  | 74 W 186 | 123 | 1.05 ns | 2+ | -1.6(3) | [182W 100 keV] | CER | 1977RuZV | BAPS 22 1032 (1977) |
|  |  | 396 | 36 ps | 4+ | -2.6(13) |  | CER | 1970McZQ | ORNL-4513 56 (1970) |
|  |  | 737 | 4.4 ps | 2+ | 1.3(3) |  | CER | 1977Ob02 | NP A291 510 (1977) |
|  |  |  |  |  |  |  |  |  |  |
| **Rhenium** | *Pionic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 75 Re 182 | 0 | 64.0 h | 7+ | +4.1(3) | [185,187Re] | NO/S | 1983Ha49 | HFI 215 105 (1983) |
|  |  | 0 + x | 12.7 h | 2+ | +1.8(2) | [185,187Re] | NO/S | 1985Ha41/1981Er01 | HFI 22 19 (1985)/PR C23 1739 (1981 |
|  |  |  |  |  |  |  |  |  |  |
|  | 75 Re 183 | 0 | 70.0 d | 5/2+ | +2.3(2) | [185,187Re] | NO/S | 1983Ha49 | HFI 215 105 (1983) |
|  |  | 497 | 7 ns | 9/2- | (+)3.7(4) | [185,187Re] | TDPAC | 1978Ne14 | HFI 4 211 (1978) |
|  |  |  |  |  |  |  |  |  |  |
|  | 75 Re 184 | 0 | 38.0 d | 3- | +2.8(2) | [185,187Re] | NO/S | 1983Ha49 | HFI 215 105 (1983) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 75 Re 185 | 0 | stable | 5/2+ | +2.18(2) |  | Pi-X | 1981Ko11 | NP A360 187 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 75 Re 186 | 0 | 90.6 h | 1- | +0.618(6) | [185,187Re] | AB | 1981Bu13 | ZP A302 290 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 75 Re 187 | 0 | 4 x 10\*10 y | 5/2+ | +2.07(2) |  | Pi-X | 1981Ko11 | NP A360 187 (1981) |
|  |  | 206 | 555 ns | 9/2- | +3.04(5) | [187Re] | TDPAC | 1973Ha61 | JCP 58 3339 (1973) |
|  |  |  |  |  |  |  |  |  |  |
|  | 75 Re 188 | 0 | 16.9 h | 1- | +0.572(6) | [185,187Re] | AB | 1981Bu13 | ZP A302 290 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| **Osmium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 182 | 7049 | 150 ns | 25+ | 4.2(2) | [188Os 155keV] | TDPAD | 1991Br25 | PL B264 17 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 183 | 0 | 13.0 h | 9/2+ | +3.1(3) | [188Os 155keV] | NO/S | 1985Ha41 | HFI 22 19 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 184 | 120 | 1.18 ns | 2+ | -2.7(12) | [188Os 155keV] | CER | 1972La16 | PR C6 613 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 186 | 137 | 830 ps | 2+ | -1.63(4) |  | Mu-X | 1981Ho22 | PR C24 1667 (1981) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 76 Os 188 | 155 | 710 ps | 2+ | -1.46(4) |  | Mu-X | 1981Ho22 | PR C24 1667 (1981) |
|  |  | 633 | 6.3 ps | 2+ | +1.0(3) | [188Os 155keV] | CER | 1980Ba42 | PR C22 2383 (1980) |
|  |  | 2121 | - | (3-) | +1.69(9) |  | Mu-X | 1979Ho23 | PR C20 1934 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 189 | 0 | stable | 3/2- | +0.86(3) | [188Os 155keV] | ME | 1972Wa24 | ZP A254 112 (1972) |
|  |  | 70 | 1.63 ns | 5/2- | -0.63(2) | [188Os 155keV] | ME | 1972Wa24 | ZP A254 112 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 190 | 187 | 366 ps | 2+ | -1.18(3) |  | Mu-X | 1981Ho22 | PR C24 1667 (1981) |
|  |  | 558 | 12.5 ps | 2+ | +0.8(5) | [188Os 155keV] | CER | 1980Ba42 | PR C22 2383 (1980) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 191 | 0 | 15.4 d | 9/2- | +2.53(16) | [188Os 155keV] | NO/S | 1979Er09 | NP A332 41 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 192 | 206 | 289 ps | 2+ | -0.96(3) |  | Mu-X | 1981Ho22 | PR C24 1667 (1981) |
|  |  | 489 | 30.1 ps | 2+ | -0.7(3) | [188Os 155keV] | CER | 1980Ba42 | PR C22 2383 (1980) |
|  |  |  |  |  |  |  |  |  |  |
|  | 76 Os 193 | 0 | 30.5 h | 3/2- | +0.48(6) | [188Os 155keV] | NO/S,R | 1985Be03/1979Er09 | JPhys G11 287 (1985)/NP A332 41 (1979 |
|  |  |  |  |  |  |  |  |  |  |
| **Iridium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  | *A. Estimated efg at Ir in hcp Co metal crystal* | | | |  |  |  |  |  |
|  | *B. Estimated efg at Ir in Os metal polycrystal* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 182 | 0 | 15 m | 3+ | -1.7(6) | [191Ir] | RIMS/LS | 2006Ve10 | Eur Phys J A30 489 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 183 | 0 | 55 m | 5/2- | -1.8(7) | [191Ir] | RIMS/LS | 2006Ve10 | Eur Phys J A30 489 (2006) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 184 | 0 | 3.14 h | 5- | +2.41(3) | A | QI-NMR/ON | 1996Se15 | PRL 77 5016 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 185 | 0 | 14.4 h | 5/2- | -1.84(12) | A | NMR/ON R | 1988Oh02 | J Phys G 14 365 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 186 | 0 | 16.64 h | 5+ | -2.55(3) | A | QI-NMR/ON | 1996Se15 | PRL 77 5016 (1996) |
|  |  | x |  | 2(-) | +1.456(17) | A | QI-NMR/ON | 1996Se15 | PRL 77 5016 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 187 | 0 | 10.5 h | 3/2+ | +0.941(11) | A | QI-NMR/ON | 1996Se15 | PRL 77 5016 (1996) |
|  |  | 434 | 152 ns | 11/2- | 2.33(14) | [193Ir] | TDPAC | 1978HaXO | ARHMI 52 1977 |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 188 | 0 | 40.5 h | 1(-) | +0.484(6) | A | QI-NMR/ON | 1996Se15 | PRL 77 5016 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 189 | 0 | 13.1 d | 3/2+ | +0.82(8) | [191Ir] | RIMS/LS | 2006Ve10 | Eur Phys J A30 489 (2006) |
|  |  |  |  |  | ['+0.878(10)] |  | Estimated | 1996Se15 | PRL 77 5016 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 190 | 0 | 11.8 d | (4)+ | +2.87(16) | A | NO/S | 1980Mu07 | HFI 7 481 (1980) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 77 Ir 191 | 0 | stable | 3/2+ | +0.816(9) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 192 | 0 | 74.2 d | 4- | +2.15(6) | A | QI-NMR/ON | 1996Se15 | PRL 77 5016 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 193 | 0 | stable | 3/2+ | +0.751(9) |  | Mu-X | 1984Ta04 | PR C29 1830 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 77 Ir 194 | 0 | 19.4 h | 1- | +0.339(12) | [191Ir] | NMR/ON | 1985Ed02 | PR C32 582 (1985) |
|  |  |  |  |  |  |  |  |  |  |
| **Platinum** | *There is no adopted reference efg for Pt.* | | | |  |  |  |  |  |
|  | *A. For details of the efg used see 1992Hi07* | | | |  |  |  |  |  |
|  | *B. Estimated efg at Pt in osmium metal* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 183 | 35 | 43 s | 7/2- | +3.4(3) | A | LS | 1999Le52/1992Hi07 | PR C60 054310 (1999)/ZP A342 1 (1992 |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 185 | 0 | 70.9 m | 9/2+ | +3.73(17) | A | LS | 1999Le52/1992Hi07 | PR C60 054310 (1999)/ZP A342 1 (1992 |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 187 | 0 | 2.35 h | 3/2- | -1.02(4) | A | RIMS/LS | 1992Hi07/1989Du01 | ZP A342 1 (1992)/PL B217 401 (1989 |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 189 | 0 | 10.9 h | 3/2- | -0.95(4) | A | RIMS/LS | 1992Hi07/1989Du01 | ZP A342 1 (1992)/PL B217 401 (1989 |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 191 | 0 | 2.9 d | 3/2- | -0.87(4) | A | RIMS/LS | 1992Hi07/1989Du01 | ZP A342 1 (1992)/PL B217 401 (1989 |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 192 | 317 | 43.7 ps | 2+ | +0.6(2) |  | CER | 1987Gy01 | NP A470 415 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 194 | 328 | 41.8 ps | 2+ | +0.48(14) |  | CER | 1986Gy04 | NP A458 165 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 195 | 259 | 4.02 d | 13/2+ | +1.4(6) | B | NO/S | 1985Ed05 | PL B158 371 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 196 | 356 | 34 ps | 2+ | +0.62(8) |  | CER | 1992Li14 | NP A548 308 (1992) |
|  |  | 689 | 36.8 ps | 2+ | -0.39(16) |  | CER | 1992Li14 | NP A548 308 (1992) |
|  |  | 877 | 3.6 ps | 4+ | +1.03(12) |  | CER | 1992Li14 | NP A548 308 (1992) |
|  |  | 1526 | 0.98 ps | 6+ | -0.2(3) |  | CER | 1992Li14 | NP A548 308 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 78 Pt 198 | 407 | 22.3 ps | 2+ | +0.42(12) |  | CER | 1986Gy04 | NP A458 165 (1986) |
|  |  |  |  |  |  |  |  |  |  |
| **Gold** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 184 | 0 | 21 s | 5 | +4.7(3) | [197Au] | CLS | 1997Le22 | PRL 79 2213 (1997) |
|  |  |  | 49 s | 2 | +1.90(16) | [197Au] | CLS | 1997Le22 | PRL 79 2213 (1997) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 185 | 0 | 4.2 m | 5/2- | -1.10(10) | [186Au, 197Au] | CLS | 1992Ki30/1994Pa37 | NIMPR B70 537 (1992)/NP A580 173 (1994 |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 186 | 0 | 10.7 m | 3- | +3.10(6) | [186Au, 197Au] | CLS | 1992Ki30/1994Pa37 | NIMPR B70 537 (1992)/NP A580 173 (1994 |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 191 | 0 | 3.18 h | 3/2+ | +0.72(2) | [197Au] | CLS | 1994Pa37 | NP A580 173 (1994) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 192 | 0 | 5.0 h | 1- | -0.228(8) | [197Au] | CLS | 1994Pa37 | NP A580 173 (1994) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 193 | 0 | 17.65 h | 3/2+ | +0.66(2) | [197Au] | CLS | 1994Pa37 | NP A580 173 (1994) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  | 290 | 3.9 s | 11/2- | +1.98(6) | [197Au] | MAPON | 1996Se06 | NP A602 41 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 194 | 0 | 39.5 h | 1- | -0.240(9) | [197Au] | CLS | 1994Pa37 | NP A580 173 (1994) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 195 | 0 | 183 d | 3/2+ | +0.607(18) | [197Au] | QI-NMR/ON | 1993Hi10 | NP A562 205 (1993) |
|  |  | 319 | 30.6 s | 11/2- | +1.87(6) | [197Au] | MAPON | 1996Se06 | NP A602 41 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 196 | 0 | 6.18 d | 2- | +0.81(7) | [197Au] | NMR/ON | 1987Oh11 | PR C36 2072 (1987) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 79 Au 197 | 0 | stable | 3/2+ | +0.547(16) |  | Mu-X | 1974Po02 | NP A230 413 (1974) |
|  |  | 409 | 7.8 s | 11/2- | +1.68(5) | [197Au] | MAPON | 1996Se06 | NP A602 41 (1996) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 198 | 0 | 2.696 d | 2- | +0.640(19) | [197Au] | NMR/ON | 1993Hi10 | NP A562 205 (1993) |
|  |  |  |  |  |  |  |  |  |  |
|  | 79 Au 199 | 0 | 3.14 d | 3/2+ | +0.510(16) | [197Au] | NMR/ON | 1993Hi10 | NP A562 205 (1993) |
|  |  |  |  |  |  |  |  |  |  |
| **Mercury** | *Efg calculations in the 3P1 state of neutral Hg* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 185 | 99.3 | 27 s | 13/2+ | +0.2(3) | [201Hg] | -RADOP | 1979Da06 | PL B82 199 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 187 | 0 | 2.4 m | 13/2+ | +0.5(3) | [201Hg] | -RADOP | 1979Da06 | PL B82 199 (1979) |
|  |  | 134 | 1.9 m | 3/2- | -0.75(18) | [201Hg] | -RADOP | 1986Ul02/1979Da06 | ZP A325 247(1986)/PL B82 199 (1979 |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 188 | 2724 | 135 ns | 12+ | 0.91(11) | [199Hg 158 keV] | TDPAD | 1984Dr09 | PL B149 311 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 189 | 0 | 7.6 m | 3/2- | -0.8(3) | [201Hg] | -RADOP | 1986Ul02/1979Da06 | ZP A325 247(1986)/PL B82 199 (1979 |
|  |  | 0 + x | 8.6 m | 13/2+ | +0.66(19) | [201Hg] | -RADOP | 1979Da06 | PL B82 199 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 190 | 2621 | 21 ns | 12+ | 1.17(14) | [199Hg 158 keV] | TDPAD | 1984Dr09 | PL B149 311 (1984) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 191 | 0 | 49 m | 3/2- | -0.80(13) | [201Hg] | -RADOP | 1986Ul02/1979Da06 | ZP A325 247(1986)/PL B82 199 (1979 |
|  |  | 140 | 50.8 m | 13/2+ | +0.6(2) | [201Hg] | -RADOP | 1979Da06 | PL B82 199 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 193 | 0 | 3.80 h | 3/2- | -0.7(3) | [201Hg] | O | 1974Fu06/1966Da07 | PR A9 593 (1974)/PR 147 861 (1966 |
|  |  | 141 | 11.8 h | 13/2+ | +0.92(2) | [201Hg] | O | 1974Re05 | PR A9 1776 (1974) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 195 | 176 | 41.6 h | 13/2+ | +1.08(2) | [201Hg] | O | 1965Sm01 | PR A137 330 (1965) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 197 | 134 | 8.1 ns | 5/2- | +0.081(6) | [199Hg 158 keV] | TDPAC | 1980He05 | NP A337 261 (1980) |
|  |  | 299 | 23.8 h | 13/2+ | +1.25(3) | [201Hg] | O | 1961Br17 | J Phys Radium 22 412 (1961) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 198 | 412 | 23 ps | 2+ | +0.68(12) or +0.84(12) |  | CER | 1979Bo16/1984Fe08 | ZP A291 245 (1979)/NP A425 373 (1984 |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 199 | 158 | 2.45 ns | 5/2- | +0.95(7) |  | Mu-X | 1979Ha08 | NP A314 361 (1979) |
|  |  | 208 | 69 ps | 3/2- | +0.62(15) |  | Mu-X | 1979Ha08 | NP A314 361 (1979) |
|  |  | 532 | 42.6 m | 13/2+ | +1.2(3) | [201Hg] | -RADOP | 1979Da06 | PL B82 199 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 200 | 368 | 46.6 ps | 2+ | +0.96(11) or +1.11(11) |  | CER | 1979Bo16 | ZP A291 245 (1979) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 80 Hg 201 | 0 | stable | 3/2- | +0.387(6) |  |  | 2005Bi03/1961Ko05 | PR A71 012502 (2005)/PR 121 1104 (1961 |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 202 | 440 | 27.3 ps | 2+ | +0.87(13) or +1.01(13) |  | CER | 1980Sp05 | NP A345 252 (1980) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 203 | 0 | 46.8 d | 5/2- | +0.344(7) | [201Hg] | O | 1970Re14 | PR A2 1135 (1970) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 204 | 437 | 40.2 ps | 2+ | +0.4(2) |  | CER | 1981Es03 | NP A362 227 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 80 Hg 206 | 2102 | 2.15 ms | 5- | 0.74(15) | [199Hg 158 keV] | TDPAD | 1984Ma43 | PR C30 1702 (1984) |
|  |  |  |  |  |  |  |  |  |  |
| **Thallium** | *There is no adopted reference efg for Th.* | | | |  |  |  |  |  |
|  | *A. For reference to the efg used in CLS studies see 1987Bo44 (PR C36 2560 (1987)* | | | | |  |  |  |  |
|  | *B. Estimated efg in In metal* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 187 | 335 | 15.6 s | (9/2-) | -2.43(5) | A | CLS | 1993ScZW | IoP Conf 132 221 (1993) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 188 | 0 + x | 71 s | 7+ | +0.129(4) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 189 | 281 | 1.4 m | 9/2- | -2.29(4) | A | CLS | 1987Bo44 | PR C36 2560 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 190 | 0 + x | 2.6 m | 2- | -0.329(9) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  | 0 + y | 3.7 m | 7+ | +0.285(14) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 191 | 299 | 5.2 m | 9/2- | -2.23(2) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 192 | 0 + x | 9.6 m | 2- | -0.328(11) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  | 0 + y | 10.8 m | 7+ | +0.46(2) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  | 251 + x | 296 ns | 8- | 0.44(7) | B | TDPAD | 1982Sc27 |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 193 | 365 | 2.11m | 9/2- | -2.20(2) | A | CLS | 1987Bo44 | PR C36 2560 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 194 | 0 | 34 m | 2- | -0.282(7) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  | 0 + y | 32.8 m | 7+ | +0.607(16) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 196 | 0 | 1.84 h | 2- | -0.178(14) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  | 394 | 1.41 h | 7+ | +0.76(2) | A | CLS | 1992Me07 | ZP A341 475 (1992) |
|  |  |  |  |  |  |  |  |  |  |
|  | 81 Tl 205 | 204 | 1.5 ns | 3/2+ | +0.74(15) |  | Mu-X | 1972Ch07 | NP A181 25 (1972) |
|  |  | 2623 | short | (5/2)- | -0.5(2) |  | Mu-X | 1972Ch07 | NP A181 25 (1972) |
|  |  |  |  |  |  |  |  |  |  |
| **Lead** | *Efg in 3P1 state of neutral Pb* | | |  |  |  |  |  |  |
|  | *A. Efg in 1D2 state in neutral Pb* | | |  |  |  |  |  |  |
|  | *B. Normalised to estimated Q of 206Pb 4027 keV* | | | |  |  |  |  |  |
|  | *C. Obtained from theory of relaxation in Hg metal* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 191 | 138 | 2.18 m | 13/2+ | +0.085(5) | A | CLS | 1991Du07 | ZP A341 39 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 192 | 2581+d | 1.07 ms | 12+ | 0.32(4) | B | TDPAD | 2007Io03 | PL B650 141 (2007) |
|  |  | 2743 | 756 ns | 11- | 2.9(3) | B | TDPAD | 2007Io03 | PL B650 141 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 193 | 100 | 5.8 m | 13/2+ | +0.195(10) | A | CLS | 1991Du07 | ZP A341 39 (1991) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  | 1586 + x | 22 ns | (21/2-) | 0.22(2) | B | TDPAD | 2004Ba31 | Eur Phys J A20 191 (2004) |
|  |  | 2585 + x | 9.4 ns | (27/2-) | 2.6(3) | B | TDPAD | 2011Ba02 |  |
|  |  |  |  | (29/2-) | 2.8(3) | B | TDPAD | 2004Ba31 | Eur Phys J A20 191 (2004) |
|  |  | 2613 + x | 135 ns | (33/2+) | 0.45(4) | B | TDPAD | 2004Ba31 | Eur Phys J A20 191 (2004) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 194 | 2628 | 350 ns | 12+ | 0.49(3) | B | TDPAD | 1985St16 | ZP A322 83 (1985) |
|  |  | 2933 | 122 ns | 11- | 3.6(4) | B | TDPAD | 2007Io03 | PL B650 141 (2007) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 195 | 203 | 15.0 m | 13/2+ | +0.306(15) | A | CLS | 1991Du07 | ZP A341 39 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 196 | 2694 | 269 ns | 12+ | 0.65(5) | B | TDPAD | 1981Zy02 | HFI 9 109 (1981) |
|  |  | 3191 | 85 ns | 11- | (-)3.4(7) | B | LEMS | 2002Vy01 | PRL 88 102502 (2002) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 197 | 0 | 8 m | 3/2- | -0.08(17) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  | 319 | 43 m | 13/2+ | +0.378(19) | A | CLS | 1991Du07 | ZP A341 39 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 198 | 2820 | 212 ns | 12+ | 0.75(5) | B | TDPAD | 1981Zy02 | HFI 9 109 (1981) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 199 | 0 | 1.5 h | 3/2- | '+0.08(9) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 200 | 2154 | 44 ns | 7- | 0.32(2) | B | TDPAD | \*\*\*\*\*\*\*\*\* | AECL-6680 27 (1979) |
|  |  | 2183 | 480 ns | 9- | 0.40(2) | B | TDPAD | \*\*\*\*\*\*\*\* | AECL-6680 27 (1979) |
|  |  | 3006 | 152 ns | 12+ | 0.79(3) | B | TDPAD | 1979Ma37 | PL B88 48 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 201 | 0 | 9.33 h | 5/2- | 0.01(4) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  | 2719 | 63 ns | 25/2- | 0.46(2) | B | TDPAD | \*\*\*\*\*\*\*\*\*etc | AECL-6680 27 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 202 | 2170 | 3.62 h | 9- | +0.58(9) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  | 2208 | 65 ns | 7- | 0.28(2) | B | TDPAD | \*\*\*\*\*\*\*\*\*etc | AECL-6680 27 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 203 | 0 | 51.9 h | 5/2- | +0.10(5) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  | 1921 | 56 ns | 21/2+ | 0.85(3) | B | TDPAD | \*\*\*\*\*\*\*\*\*etc | AECL-6680 27 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 204 | 899 | 2.94 ps | 2+ | +0.23(9) |  | CER | 1978Jo04 | PL B72 307 (1978) |
|  |  | 1274 | 280 ns | 4+ | 0.44(2) | B | TDPAD | \*\*\*\*\*\*\*\*\*etc | AECL-6680 27 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 205 | 0 | 1.5x10\*7y | 5/2- | +0.23(4) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  | 1014 | 5.55 ms | 13/2+ | 0.30(5) | C | QIR | 1974Ri03 | PS 11 228 (1975) |
|  |  | 3196 | 217 ns | 25/2- | 0.63(3) | B | TDPAD | \*\*\*\*\*\*\*\*\*etc | AECL-6680 27 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 206 | 803 | 8.4 ps | 2+ | +0.05(9) |  | CER | 1978Jo04 | PL B72 307 (1978) |
|  |  | 2200 | 123 ms | 7- | 0.33(5) | C | QIR | 1974Ri03 | PS 11 228 (1975) |
|  |  | 4027 | 185 ns | 12+ | estimated 0.51(2) |  | from B(E2) | 1979Ma37 | PL B88 48 (1979) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 208 | 2615 | 15 ps | 3- | -0.34(15) |  | CER | 1984Ve07 | AuJP 37 123 (1984) |
|  |  | 4086 | 0.74 fs | 2+ | -0.7(3) |  | CER | 1984Ve07 | AuJP 37 123 (1984) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 82 Pb 209 | 0 | 3.25 h | 9/2+ | -0.27(17) |  | CLS | 1986An06 | ZP A451 471 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 82 Pb 211 | 0 | 36.1 m | 9/2+ | +0.09(6) |  | CLS | 1986An06 | ZP A451 471 (1986) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| **Bismuth** | *Efg calculations in the 4P3/2 state of neutral Bi* | | | |  |  |  | 2001Bi23 | PRL 87 133003 (2001) |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 202 | 0 | 1.72 h | [5+] | -1.00(9) | [209Bi] | LFRS | 1996Ca02/2001Bi23 | NP A598 61 (1996)/PRL 87 133003 (2001 |
|  |  |  |  | [6+] | -1.21(9) | [209Bi] | LFRS | 1996Ca02/2001Bi23 | NP A598 61 (1996)/PRL 87 133003 (2001 |
|  |  | 615 | 3.04 ms | 10- | 0.14(2) | [209Bi] | TDPAD | 1987Ma65 | HFI 34 47 (1987) |
|  |  | 2607 | 310 ns | 17+ | 0.45(2) | [209Bi] | TDPAD | 1987Ma65 | HFI 34 47 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 203 | 0 | 11.8 h | 9/2- | -0.93(7) | [209Bi] | LFRS | 1996Ca02/2001Bi23 | NP A598 61 (1996)/PRL 87 133003 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 204 | 0 | 11.22 h | 6+ | -0.68(20) | [209Bi] | LFRS | 1996Ca02/2001Bi23 | NP A598 61 (1996)/PRL 87 133003 (2001 |
|  |  | 806 | 13.0 ms | 10- | 0.074(2) | [209Bi] | LEMS | 1991Sc14 | PR C43 2560 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 205 | 0 | 15.3 d | 9/2- | -0.81(3) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 206 | 0 | 6.243 d | 6+ | -0.54(4) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  | 1045 | 0.89 ms | (10-) | 0.057(11) | [209Bi] | LEMS | 1991Sc14 | PR C43 2560 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 207 | 0 | 32.2 y | 9/2- | -0.76(2) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  | 2101 | 182 ms | 21/2+ | 0.051(9) | [209Bi] | LEMS | 1991Sc14 | PR C43 2560 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 208 | 0 | 3.7x10\*5 y | 5+ | -0.70(8) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 83 Bi 209 | 0 | stable | 9/2- | -0.516(15) |  | AB | 1970Hu05/2001Bi23 | PR A1 685 (1970)/PRL 87 133003 (2001 |
|  |  | 2563 | 14 fs | (9/2)+ | +0.15(7) | [209Bi] | Mu-X | 1972Le07 | NP A180 14 (1972) |
|  |  | 2741 | 12 ps | 15/2+ | 0.0(5) | [209Bi] | Mu-X | 1972Le07 | NP A180 14 (1972) |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 210 | 0 | 5.01 d | 1- | +0.190(6) | [209Bi] | AB | 1962Al02/2001Bi23 | PR 125 256 (1962)/PRL 87 133003 (2001 |
|  |  | 271 | 3.0x10\*6 y | 9- | -0.66(7) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 212 | 0 | 60.6 m | 1(-) | +0.1(4) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  |  |  |  |  |  |  |  |  |
|  | 83 Bi 213 | 0 | 45.6 m | 9/2- | -0.83(5) | [209Bi] | LRFS | 2000Pe30/2001Bi23 | J Phys G26 1829(2000)/PRL 87 133003 (2001 |
|  |  |  |  |  |  |  |  |  |  |
| **Polonium** | *There is no adopted reference efg for Po.* | | | |  |  |  |  |  |
|  | *A. The moments quoted are based on a calculated value for the 1557 keV, 8+, state in 210Po [1991Be03, NPA522 483 (1991)].* | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 200 | 1774 | 61 ns | 8+ | (-)1.38(7) | A | TDPAD | 1987Ma65 | HFI 34 47 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 202 | 1712 | 110 ns | 8+ | (-)1.21(16) | A | LEMS | 1997Ne06 | NP A625 668 (1997) |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 204 | 1639 | 158 ns | 8+ | (-)1.14(5) | A | TDPAD | 1987Ma65 | HFI 34 47 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 206 | 1586 | 212 ns | 8+ | (-)1.02(4) | A | TDPAD | 1987Ma65 | HFI 34 47 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 208 | 1528 | 380 ns | 8+ | (-)0.90(4) | A | TDPAD | 1987Ma65 | HFI 34 47 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 209 | 1473 | 98.1 ns | (17/2-) | (-)0.39(8) | A | TDPAD | 1983Da01 | NP A394 245 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 84 Po 210 | 1557 | 96 ns | 8+ | -0.55(2) | calculation | from B(E2) | 1991Be03 | NP A522 483 (1991) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  | 2849 | 20.1 ns | 11- | (-)0.86(11) | A | TDPAD | 1991Be03 | NP A522 483 (1991) |
|  |  | 4372 | 51 ns | 13- | (-)0.90(7) | A | TDPAD | 1991Be03 | NP A522 483 (1991) |
|  |  | 5058 | 265 ns | 16+ | (-)1.30(2) | A | TDPAD | 1991Be03 | NP A522 483 (1991) |
|  |  |  |  |  |  |  |  |  |  |
| **Astitine** | *There is no adopted reference efg for As.* | | | |  |  |  |  |  |
|  | *A. The moments quoted are based on a calculated value for the 1417 keV, 21/2-, state in 211At [1995Ba66 NP A591 104 (1995)].* | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 85 At 208 | 1090 | 48 ns | 10- | (-)1.67(18) | A | LEMS | 1991Sc15 | PR C43 2566 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 85 At 209 | 1428 | 26 ns | 21/2- | (-)0.78(6) | A | TDPAD | 1983Ma08 | PL B122 27 (1983) |
|  |  | 2429 | 890 ns | 29/2+ | (-)1.49(9) | A | TDPAD | 1983Ma08 | PL B122 27 (1983) |
|  |  |  |  |  |  |  |  |  |  |
|  | 85 At 210 | 1363 | 28.4 ns | 11+ | (-)0.64(5) | A | TDPAD | 1983Ma08 | PL B122 27 (1983) |
|  |  | 2550 | 480 ns | 15- | (-)1.21(7) | A | TDPAD | 1983Ma08 | PL B122 27 (1983) |
|  |  | 4028 | 5.9 ms | 19+ | (-)2.16(18) | A | LEMS | 1991Sc15 | PR C43 2566 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 85 At 211 | 1417 | 35.1 ns | 21/2- | (-)0.524(10) | calculation | from B(E2) | 1995Ba66 | NP A591 104 (1996) |
|  |  | 2641 | 50.8 ns | 29/2+ | (-)1.01(7) | A | TDPAD | 1983Ma08 | PL B122 27 (1983) |
|  |  | 4816 | 4.2 ms | 39/2- | (-)1.88(19) | A | LEMS | 1991Sc15 | PR C43 2566 (1991) |
|  |  |  |  |  |  |  |  |  |  |
| **Radon** | *There is no adopted reference efg for Ra.* | | | |  |  |  |  |  |
|  | *A. Estimated efg in Rn atom [CERN EP/87 51 (1987)]* | | | |  |  |  |  |  |
|  | *B. Normalised to Q of 1694 keV, 8+ state in 212Rn estimated from B(E2)* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 203 | 361 | 28 s | (13/2+) | +1.28(13) | 209Rn | CLS | 1987OtZW | CERN EP/87 51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 205 | 0 | 2.83 m | 5/2- | +0.062(6) | 209Rn | CLS | 1987OtZW | CERN EP/87 51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 207 | 0 | 9.3 m | 5/2- | +0.22(2) | 209Rn | CLS | 1987OtZW | CERN EP/87 51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 208 | 1826 | 490 ns | 8+ | 0.41(5) | B | TDPAD | 1986Be40 | PL B182 11 (1986) |
|  |  |  |  |  |  |  |  |  |  |
| *n* | 86 Rn 209 | 0 | 29 m | 5/2- | +0.31(3) | A | CLS | 1987OtZW | CERN EP/87 51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 210 | 1665+x | 644 ns | (8+) | 0.32(4) | B | TDPAD | 1986Be40 | PL B182 11 (1986) |
|  |  | 3812+x | 1.05 ms | (17)- | 0.89(10) | B | TDPAD | 1986Be40 | PL B182 11 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 211 | 1578+x | 596 ns | 17/2- | 0.19(2) | B | TDPAD | 1985Da14 | PRL 55 1269 (1985) |
| c |  | 8855+y | 201 ns | 63/2- | 1.6(2) | B | TDPAD | 1985Da14 | PRL 55 1269 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 212 | 1502 | 8.8 ns | 4+ |  |  |  |  |  |
|  |  | 1694 | 0.91 ms | 8+ | -0.18(2) | from B(E2) | not measured | 1985Da13 | NP A441 501 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 219 | 0 | 3.96 s | 5/2+ | +1.15(12) | 209Rn | CLS | 1987OtZW | CERN EP/87 51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 221 | 0 | 25 m | 7/2+ | -0.47(5) | 209Rn | CLS | 1987OtZW | CERN EP/87 51 (1987) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 223 | 0 | 23.2 m | 7/2 | +0.80(8) | 209Rn | CLS | 1988NeZZ | Bk88 NFFS 126 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 86 Rn 225 | 0 | 4.5 m | 7/2- | +0.84(8) | 209Rn | CLS | 1988NeZZ | Bk88 NFFS 126 (1988) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| **Francium** | *Efg calculated in the 2P3/2 state of the Fr atom (PR A27 3332 (1983) revised (PL B163 (1985)).* | | | | | |  |  |  |
|  | *A. Normalised to calculated Q of the 2538 keV 29/2+ state in 211Fr.* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 207 | 0 | 14.8 s | 9/2- | -0.16(5) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 208 | 0 | 58.6 s | 7+ | 0.00(4) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 209 | 0 | 50 s | 9/2- | -0.24(2) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 210 | 0 | 3.2 m | 6+ | +0.19(2) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 211 | 0 | 3.1 m | 9/2- | -0.19(3) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  | 2423 | 146 ns | 29/2+ | (-)1.07(18) | A | LEMS | 1991Ha02 | PR C43 514 (1991) |
|  |  | 4657 | 123 ns | 45/2- | (-)2.0(6) | A | LEMS | 1991Ha02 | PR C43 514 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 212 | 0 | 19.3 m | 5+ | -0.10(1) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  | 2492 | 604 ns | (15-) | (-)0.84(13) | A | TDPAD | 1990By03 | NP A516 145 (1990) |
|  |  | 5854 | 312 ns | (27-) | (-)1.7(3) | A | TDPAD | 1990By03 | NP A516 145 (1990) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 213 | 0 | 34.7 s | 9/2- | -0.14(2) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  | 2538 | 243 ns | 29/2+ | [-0.70(7)] | calculated | not measured | 1990By03 | NP A516 145 (1990) |
|  |  | 8095 | 3.1 ms | 65/2- | (-)2.2(5) | A | LEMS | 1991Ha02 | PR C43 514 (1991) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 214 | 640 | 103 ns | 11+ | 0.8(2) | A | LEMS | 1995Ne06 | PR C51 3483 (1995) |
|  |  | 6477+D' | 108 ns | 32+ or 33+ | 2.2(5) | A | LEMS | 1995Ne06 | PR C51 3483 (1995) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 220 | 0 | 27.4 s | 1+ | +0.47(3) | 223Fr | ABLS | 1985Co24/1987Co19 | PL B163 66 (1985)/NP A468 1 (1987 |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 221 | 0 | 4.8 m | 5/2- | -0.98(6) | 223Fr | ABLS | 1985Co24/1987Co19 | PL B163 66 (1985)/NP A468 1 (1987 |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 222 | 0 | 14.2 m | 2- | +0.51(4) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 87 Fr 223 | 0 | 21.8 m | 3/2(-) | +1.17(1) |  | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 224 | 0 | 3.3 m | 1(-) | +0.517(4) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 225 | 0 | 3.9 m | 3/2- | "+1.32(5) | 223Fr | ABLS | 1985Co24/1987Co19 | PL B163 66 (1985)/NP A468 1 (1987 |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 226 | 0 | 48 s | 1 | -1.35(2) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 87 Fr 228 | 0 | 39 s | 2- | +2.38(5) | 223Fr | ABLS | 1985Co24 | PL B163 66 (1985) |
|  |  |  |  |  |  |  |  |  |  |
| **Radium** | *Efg calculated in 7s7p states of the Ra atom* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 88 Ra 209 | 0 | 4.7 s | 5/2- | +0.39(4) | 223Ra | CLS | 1989Ne03 | ZP D11 105 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 88 Ra 211 | 0 | 13s | 5/2- | +0.46(4) | 223Ra | CLS | 1989Ne03 | ZP D11 105 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 88 Ra 221 | 0 | 30 s | 5/2- | +1.92(6) | 223Ra | CLS | 1989Ne03 | ZP D11 105 (1989) |

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| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 88 Ra 223 | 0 | 11.44 d | 3/2+ | +1.21(3) |  | CLS | 2008Py02/1989Ne03 | Mol Phys 106 1965 (2008)/ZP D11 105 (1989 |
|  |  |  |  |  |  |  |  |  |  |
|  | 88 Ra 227 | 0 | 42.2 m | 3/2+ | +1.53(6) | 223Ra | CLS | 1989Ne03 | ZP D11 105 (1989) |
|  |  |  |  |  |  |  |  |  |  |
|  | 88 Ra 229 | 0 | 4.0 m | 5/2(+) | +2.99(12) | 223Ra | CLS | 1989Ne03 | ZP D11 105 (1989) |
|  |  |  |  |  |  |  |  |  |  |
| **Actinium** | *There is no adopted reference efg for Ac.* | | | |  |  |  |  |  |
|  | *The quoted value and its error are both quite uncertain.* | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 89 Ac 227 | 0 | 21.77 y | 3/2- | -1.7(2) |  | O | 1955Fr26 | PR 98 1514 (1955) |
|  |  |  |  |  |  |  |  |  |  |
| **Thorium** | *There is no adopted reference efg for Th.* | | | |  |  |  |  |  |
|  | *A. Based on estimated efg in the Th atom* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 90 Th 229 | 0 | 7340 y | 5/2+ | +4.3(9) | A | O | 1974Ge06 | JPPa 35 483 (1974) |
|  |  |  |  |  |  |  |  |  |  |
| **Protoactinium** | *There is no adopted reference efg for Pa.* | | | |  |  |  |  |  |
|  | *A. Estimated from B(E2) value.* | | |  |  |  |  |  |  |
|  | *B. Based on estimated efg in the Pr atom* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | 91 Pa 231 | 0 | 3.3x10\*4 y | 3/2- | [-1.72(5)] | A |  | 1978Fr28 | PL A69 225 (1975) |
|  |  | 84.2 | 41 ns | 5/2+ | +0.7(2) | 231Pa | ME | 1978Fr28 | PL A69 225 (1975) |
|  |  |  |  |  |  |  |  |  |  |
|  | 91 Pa 233 | 0 | 27.0 d | 3/2- | -3.0(4) | B | AB | 1961Ma42 | NP 23 90 (1961) |
|  |  |  |  |  |  |  |  |  |  |
| **Uranium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 92 U 233 | 0 | 1.6x10\*5 y | 5/2+ | +3.663(8) |  | Mu-X | 1984Zu02 | PRL 53 1888 (1984) |
|  |  | 40 | 50 ps | 7/2+ | +0.64(3) |  | Mu-X | 1984Zu02 | PRL 53 1888 (1984) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 92 U 235 | 0 | 7.0x10\*8 y | 7/2- | +4.936(6) |  | Mu-X | 1984Zu02 | PRL 53 1888 (1984) |
|  |  | 46 | < 60 ps | 9/2- | +1.87(3) |  | Mu-X | 1984Zu02 | PRL 53 1888 (1984) |
|  |  |  |  |  |  |  |  |  |  |
| **Neptunium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 93 Np 237 | 0 | 2.1x10\*6 y | 5/2+ | +3.886(6) |  | Mu-X | 1987De10 | PL B189 7 (1987) |
|  |  | 60 | 68 ns | 5/2- | +3.85(4) | 237Np | ME | 1968Pi01/1968St03 | BAPS 13 28 (1968)/PR 165 1319 (1968 |
|  |  |  |  |  |  |  |  |  |  |
| **Plutonium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  | *A. Calculated efg of the 8F3/2 state of Pu II* | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 94 Pu 239 | 8 | 36 ps | 3/2+ | -2.319(7) |  | Mu-X | 1986Zu01 | PL B167 383 (1986) |
|  |  | 57 | 101 ps | 5/2+ | -3.345(13) |  | Mu-X | 1986Zu01 | PL B167 383 (1986) |
|  |  | 76 | 83 ps | 7/2+ | -3.83(3) |  | Mu-X | 1986Zu01 | PL B167 383 (1986) |
|  |  |  |  |  |  |  |  |  |  |
|  | 94 Pu 241 | 0 | 14.4 y | 5/2+ | +6(2) | A | O | 1964Ch12 | JPPa 25 825 (1964) |
|  |  |  |  |  |  |  |  |  |  |
| **Americium** | *Muonic atom X-ray hyperfine structure* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Nucleus* | *E(level)* |   | *I p* | *Q(b)* | *Ref. Std.* | *Method* | *NSR Keynumber* | *Journal Reference* |
| *Reference isotope* | 95 Am 241 | 0 | 432.7 y | 5/2- | +4.34(5) |  | Mu-X | 1985Jo04 | PL B161 75 (1985) |
|  |  |  |  |  |  |  |  |  |  |
|  | 95 Am 242 | 0 | 16.0 h | 1- | -2.44((3) | 241Am | AB | 1966Ar04 | PR 144 994 (1966) |
|  |  | 49 | 152 y | 5- | +6.7(4) | 241Am | ABLS | 1988Be30 | ZP A330 235 (1988) |
|  |  |  |  |  |  |  |  |  |  |
|  | 95 Am 243 | 0 | 7370 y | 5/2- | +4.32(6) |  | Mu-X | 1985Jo04 | PL B161 75 (1985) |
|  |  | 84 | 2.3 ns | 5/2+ | +4.2(2) | 241Am | ME | 1976Bo13 | JINC 38 1291 (1976) |
|  |  |  |  |  |  |  |  |  |  |
| **Einsteinium** | *Efg calculated in the Es atom* | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 99 Es 253 | 0 | 20.4 d | 7/2+ | +6.7(8) |  | AB | 1975Go05 | PR A11 499 (1975) |
|  |  |  |  |  |  |  |  |  |  |
| *Reference isotope* | 99 Es 254 | 78 | 39.3 h | 2+ | +3.7(5) |  | AB | 1975Go05 | PR A11 499 (1975) |
|  |  |  |  |  |  |  |  |  |  |