

Year-2008 Nuclear Quadrupole Moments

$Q/\text{millibarn} (=10^{-31} \text{ m}^2)$

1 (I)	2 (II)	3	4	5	6	7	8	9	10	11	12	13 (III)	14 (IV)	15 (V)	16 (VI)	17 (VII)	18 (VIII)						
1 <i>m</i> H 2 2.860(15)																	2 He -						
3 <i>m</i> Li 6 -0.808 7 -40.1	4 <i>a</i> Be 9 52.88(38)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: left;"> <tr> <td>Atomic number</td> <td>Method**</td> <td>Symbol</td> </tr> <tr> <td>Isotope</td> <td></td> <td>Q/mb</td> </tr> </table>										Atomic number	Method**	Symbol	Isotope		Q/mb	5 <i>a</i> B 10 84.59(24) 11 40.59(10)	6 <i>a</i> C 11 33.27(24)	7 <i>a</i> N 14 20.44(3)	8 <i>a</i> O 17 -25.58(22)	9 <i>m+s</i> F 19* -94.2(9)	10 <i>a</i> Ne 21 101.55(75)
Atomic number	Method**	Symbol																					
Isotope		Q/mb																					
11 <i>m</i> Na 23 104(1)	12 <i>a</i> Mg 25 199.4(20)											13 <i>a+m</i> Al 27 146.6(10)	14 Si -	15 P -	16 <i>a</i> S 33 -67.8(13) 35 47.1(9)	17 <i>a</i> Cl 35 -81.65(80) 37 -64.35(64)	18 Ar -						
19 <i>m</i> K 39 58.5 40 -73 41 71.1	20 <i>a</i> Ca 41 -66.5(18) 43 -40.8(8)	21 <i>m</i> Sc 45 -220(2)	22 <i>a</i> Ti 47 302(10) 49 247(11)	23 <i>a</i> V 50 210(40) 51 -52(10)	24 <i>a</i> Cr 53 -150(50)	25 <i>a</i> Mn 55 330(10)	26 <i>s</i> Fe <u>57</u> 160	27 <i>a</i> Co 59 +420(30)	28 <i>a</i> Ni 61 +162(15)	29 μ Cu 63 -220(15) 65 -204(14)	30 <i>a</i> Zn 67 +150(15)	31 <i>m</i> Ga 69 171(2) 71 107(1)	32 <i>m</i> Ge 73 -196	33 μ As 75 314(6)	34 Se -	35 <i>a+m</i> Br 79 313(3) 81 261.5(25)	36 <i>m</i> Kr 83 +259(1) <u>83</u> 507(3)						
37 <i>m</i> Rb 85 +276(1) 87 +133.5(5)	38 <i>a</i> Sr 87 305(2)	39 <i>a</i> Y 90 -125(11)	40 <i>m</i> Zr 91 -176(3)	41 μ Nb 93 -320(20)	42 <i>a</i> Mo 95 -22(1) 97 +255(13)	43 <i>a</i> Tc 99 -129(6)	44 <i>a</i> Ru 99 +79(4) 101 +457(23)	45 Rh -	46 μ Pd 105 +660(11)	47 <i>as</i> Ag <u>107</u> 980(110)	48 <i>a</i> Cd 111* -850(90)	49 <i>a</i> In 113 +759(8) 115 +770(8)	50 <i>s</i> Sn <u>119</u> -132(1)	51 <i>a</i> Sb 121 -543(11) <u>121</u> -728(14) 123 -692(14)	52 Te <u>125</u> -310(20)	53 <i>a+m</i> I 127 -696(12) <u>127</u> -624(11) <u>129</u> -604(10)	54 <i>m</i> Xe <u>129</u> -393(10) 131 -114(1)						
55 <i>ms</i> Cs 133 -3.43(10) <u>133</u> 302(21)	56 <i>a</i> Ba 135 +160(3) 137 +245(4)	La- Lu	72 μ Hf 177 +3365(29) 179 +3793(33)	73 π Ta 181 3170(20) <u>181</u> 3710(70)	74 W <u>182</u> -2130(350)	75 π Re 185 2180(20) 187 2070(20)	76 μ Os 189 +856(28)	77 μ Ir 191 +816(9) 193 +751(9)	78 Pt -	79 μ Au 197 547(16)	80 μ,s Hg <u>199</u> +674(77) 201 +387(6)	81 Tl	82 <i>a</i> Pb 209 -269(165)	83 <i>a</i> Bi 209 -516(15)	84 Po -	85 At -	86 Rn 209 +311(31)						
87 <i>a</i> Fr 223 1170(10)	88 <i>a</i> Ra 223 1210(30)	Ac- Lr	104 Rf -	105 Db -	106 Sg -	107 Bh -	108 Hs -	109 Mt -															

57 <i>a</i> La 138 +450(20) 139 +200(6)	58 Ce -	59 <i>a</i> Pr 141 -58.9(42)	60 <i>a</i> Nd 143 -630(60) 145 -330(30)	61 <i>a</i> Pm 147 740(200)	62 μa Sm 147 -259(26) 149 +75(8) <u>149</u> +1014(93)	63 μ Eu 151 903(10) 153 2412(21) <u>155</u> -440(20) 157 +1350(30)	64 μ Gd 155 +1270(30) <u>155</u> -440(20) 157 +1350(30)	65 μ Tb 159 +1432(8)	66 μa Dy 161 +2507(20) 163 +2648(21)	67 π Ho 165 +3580(20)	68 μ Er 167 +3565(29)	69 Tm <u>169</u> -1200(100)	70 μ Yb 173 +2800(40)	71 μa Lu 175 +3490(20) 176 +4970(30)
89 <i>a</i> Ac 227 1700(200)	90 <i>a</i> Th 229 4300(900)	91 <i>n</i> Pa 231 -1720(50) <u>231</u> 690(170)	92 μ U 233 3663(8) 235 4936(6)	93 μ Np 237 +3886(6) <u>237</u> +3850(40)	94 μ Pu <u>239</u> -3345(13) 241 5600(200) <u>243</u> 4100	95 <i>a</i> Am 243 +4210	96 Cm -	97 Bk -	98 Cf -	99 <i>a</i> Es 253 6700(800)	100 Fm -	101 Md -	102 No -	103 Lr -

** Methods for the primary Q value: ' a ' atomic, ' m ' molecular, ' s ' solid-state, ' μ ' muonic, ' n ' nuclear state lifetime, ' π ' pionic. 'X+Y': combines 'X' and 'Y'.
A star (*) indicates an excited nuclear state. Underlined isotopes refer to Mössbauer states. This version of the table finished on 27 November, 2008.
For the sources of the values, see the reviews P. Pyykkö: Mol. Phys. 106 (2008) 1965-1974 and 99 (2001) 1617-1629.