## Adopted Levels, Gammas

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Balraj Singh and Jun Chen | NDS 116, 1 (2014) | 31-Dec-2013 |

Q($\beta^-$)=687.0 *20*; S(n)=7112.3 *20*; S(p)=10986 *26*; Q($\alpha$)=−7516.2 *24* 2012Wa38
S(2n)=17632.9 *20*, S(2p)=20718 *4* (2012Wa38).
A 4.5-h activity was produced by 1937Sn02 in the irradiation of $^{84}$Kr with deuterons and assigned to $^{85}$Kr or $^{87}$Kr Later work (1943Bo01,1943Se01) confirmed the assignment of the 4.5-hour activity to $^{85}$Kr. This activity belongs to an isomer at 304.87 keV. The ground state with a much longer half-life was identified by 1947Th06. Later decay measurements: 2002Un02, 2004Sc04, 1996Er06, 1994Va37, 1993Ca41, 1992Mo10, 1992Un01, 1987Da33, 1980Me06; and many other references listed with half-life measurements of ground state and isomer.
Nuclear structure calculations: 2012Si08, 1988Er07 (levels, transition rates for multi-particle states).

### $^{85}$Kr Levels

Cross Reference (XREF) Flags

| | | | |
|---|---|---|---|
| A | $^{85}$Br $\beta^-$ decay (2.90 min) | F | $^{84}$Kr(d,p),(pol d,p) |
| B | $^{85}$Kr IT decay (4.480 h) | G | $^{86}$Kr(p,d) |
| C | $^{82}$Se($\alpha$,n$\gamma$) | H | $^{86}$Kr(d,t) |
| D | $^{82}$Se($^7$Li,p3n$\gamma$) | I | $^{86}$Kr($^3$He,$\alpha$) |
| E | $^{84}$Kr(n,$\gamma$),(n,n):resonances | | |

| E(level)[†] | J$^\pi$ | $T_{1/2}$[b] | XREF | Comments |
|---|---|---|---|---|
| 0.0 | 9/2$^+$ | 10.739 y *14* | ABCD FGHI | %$\beta^-$=100<br>$\mu$=−1.005 *2* (1995Ke04,2011StZZ)<br>Q=+0.443 *3* (1995Ke04,2001Ke15,2011StZZ)<br>RMS charge radius ($<r^2>)^{1/2}$=4.1846 fm *22* (2013An02 evaluation).<br>J$^\pi$: spin from optical spectroscopy (1955Ra13); L=4 and analyzing power in (pol d,p).<br>Configuration=$\nu g_{9/2}^{-1}$ (1989Wi01).<br>$T_{1/2}$: weighted average (NRM method) of 3916.8 d *25* (2004Sc04 from PTB; this measurement is considered to supersede earlier PTB measurements: 3915 d *3* in 1992ScZZ and 3909 d *11* in 1983Wa26), 3905 d *19* (2012Fi12, corrected value from original 3935.7 d *12* in 2002Un02, re-evaluated from 3934.4 d *14* in 1992Un01 and 1982HoZJ, NIST measurement; also 10.75 y *3* in 1965An07 at NBS, predecessor of NIST), and 3930.2 d *37* (from 10.76 Y *1* measured in 1963Le07 with assigned 0.02 uncertainty at 95% confidence level). Reduced $\chi^2$=2.5 is below the critical $\chi^2$ value of 3.0 at 95% confidence level. The NRM weighted average is 3922.6 d *51* or 10.739 y *14* using 1 sidereal year=365.25636 d. Note that in NRM method, uncertainties were adjusted upwards to 4.6 d from 2.5 d in 2004Sc04 and 4.8 d from 3.7 d in 1973Le07. Others: 10.714 y *57* (quoted in DDEP evaluation from J.W. Johnston, Battelle Pacific North-Western Lab report B-369 (1974)), 10.27 Y 18 (1953Wa17), 10.57 Y 14 (1953Tu22), 9.4 Y 4 (1947Th06, also N̂ucleonics 3, 14 (1948)). 2004Wo02 evaluation gives 3927 d *8* or 10.751 y *22*, and 2004BeZR evaluation gives 10.752 y *23*, both heavily influenced by the incorrect and very precise value in 2002Un02.<br>Additional information 1.<br>$\mu$: collinear fast beam laser spectroscopy (1995Ke04). Others: −1.0055 *4* (1993Ca41,laser resonance fluorescence spectroscopy); 1.000 *2* (1981Ge06,hyperfine structure); 1.005 (1961Ku07); 1.005 *2* (1955Ra13,optical spectroscopy).<br>Q: collinear fast beam laser spectroscopy (1995Ke04), recalculated by 2001Ke15. Others: +0.433 *8* (1993Ca41,laser resonance fluorescence spectroscopy), +0.433 *9* (1981Ge06,hyperfine structure); +0.43 *3* (1955Ra13). |

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## Adopted Levels, Gammas (continued)

### $^{85}$Kr Levels (continued)

| E(level)[†] | Jπ | $T_{1/2}$[b] | XREF | Comments |
|---|---|---|---|---|
| 304.871 *20* | 1/2⁻ | 4.480 h *8* | ABC FGHI | %IT=21.2 *5*; %β⁻=78.8 *5*<br>μ=+0.633 *2* (1995Ke04,2011StZZ)<br>$T_{1/2}$: from decay curve for 151γ and 305γ (1970Wo08). Others: 4.5 h (1950Ho02), 4.36 h *9* (1949Ko13), 1949Su14, 4.6 h *2* (1948Wo07), 4.6 h (1943Bo01,1943Se01,1946Ri07), 4.5 h *1* (1937Sn02).<br>μ: collinear fast beam laser spectroscopy (1995Ke04).<br>Jπ: L=1 and analyzing power In (pol d,p); M4 γ to 9/2⁺.<br>$T_{1/2}$: from IT decay. |
| 1107.32 *7* | 1/2⁻,3/2⁻ | | A C FGHI | Jπ: L(d,p)=1. |
| 1140.73 *7* | 5/2⁺ | 3.5 ps +*28*−*14* | ABC F i | Jπ: L=2 and analyzing power In (pol d,p). L($^3$He,α)=(3) for 1140 group is inconsistent. |
| 1166.69 *6* | (1/2,3/2,5/2⁻) | | A C g i | Jπ: γ to 1/2⁻; (5/2⁻) if this level is the same as L=(3), 1140 group in ($^3$He,α). |
| 1223.98 *7* | (5/2⁻)[&] | 2.4 ps +*6*−*4* | A C g | |
| 1342.61 *5* | (3/2⁺) | | A C F | Jπ: (M1) γ from (5/2)⁺; γ to 1/2⁻. |
| 1416.57 *9* | (5/2⁺) | 0.42 ps *7* | A C gh | Jπ: (E2) γ to 9/2⁺; RUL. |
| 1430.6[‡] *10* | 1/2⁺ | | C Fgh | Jπ: L=0 and analyzing power In (pol d,p). |
| 1611.6 *1* | (11/2⁺)[&] | 0.12 ps *3* | CD | |
| 1847.0 *10* | (7/2⁺)[&] | 0.08 ps +*3*−*2* | C I | |
| 1873.52[‡] *18* | (5/2)⁺ | 0.21 ps *14* | BC F | Jπ: L=2 and analyzing power In (pol d,p). |
| 1931.6 *1* | (13/2⁺)[&] | 0.33 ps *4* | CD | |
| 1938.83 *9* | (1/2⁺,3/2,5/2) | | A | Jπ: log *ft*=6.3 (log $f^{1u}t$=6.8) from 3/2⁻; γ to 5/2⁺. |
| 1990.1 *8* | (9/2⁺)[&] | 0.23 ps *3* | C g i | |
| 1991.8 *2* | (17/2⁺) | 1.82 μs *5* | CD | $T_{1/2}$: quoted by 2012Au07 from M. Rudigier et al., Proc. Conf. Leuven, p367 (2011). Other: 1.2 μs +*10*−*4* from pγ(t) in $^{82}$Se($^7$Li,p3nγ) (1989Wi01).<br>Jπ: E2 γ to (13/2⁺); >13/2 from excitation functions of 60γ and 1931γ in (α,nγ). |
| 2004.4 *7* | (7/2⁺)[&] | 0.21 ps *4* | C ghI | XREF: I(2030). |
| 2031.96 *8* | 1/2⁻,3/2⁻,5/2⁻ | | A gh | Jπ: log *ft*=4.9 from 3/2⁻; γ to 1/2⁻. |
| 2055.1 *9* | 3/2⁺ | | FGh | Jπ: L=2 and analyzing power In (pol d,p). |
| 2113.4 *8* | (9/2⁺)[&] | 0.63 ps *6* | C g | |
| 2135.1 *10* | (9/2⁺)[&] | 0.22 ps *3* | C g | |
| 2137.34 *7* | (3/2,5/2)⁻ | 0.48 ps *21* | A C | Jπ: log *ft*=5.4 from 3/2⁻; γ to (5/2)⁺. |
| 2144.9 *6* | (7/2⁺)[&] | 0.31 ps *6* | C g | |
| 2235.2 *10* | | | C H | |
| 2383.5 *10* | (7/2⁺)[&] | 0.08 ps *3* | C | |
| 2425 *50* | (5/2⁻,7/2⁻) | | G I | Jπ: L($^3$He,α)=(3). |
| 2497.9 *8* | (9/2⁻)[&] | | C | |
| 2513.4 *16* | (3/2⁺,5/2⁺)[a] | | F | |
| 2534.3[‡] *19* | (3/2⁺,5/2⁺)[a] | | C F | |
| 2573.7 *22* | | | F | |
| 2593 *4* | | | F | |
| 2602.4 *13* | | | C | |
| 2617.9[‡] *20* | | 0.42 ps *14* | C F | |
| 2636.7 *13* | (11/2⁺)[&] | 0.17 ps *3* | C | |
| 2742.1 *12* | 1/2⁺ | | F | Jπ: L(d,p)=0. |
| 2784.5 *12* | | | C g | |
| 2797.7 *12* | 3/2⁺,5/2⁺ | | Fg | Jπ: L(d,p)=2. |
| 2814.9 *15* | (9/2⁺)[&] | 0.24 ps *6* | C g | |
| 2845.1 *12* | (5/2)⁺ | | Fg | Jπ: L=2 and analyzing power In (pol d,p). |

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## Adopted Levels, Gammas (continued)

### $^{85}$Kr Levels (continued)

| E(level)[†] | Jπ | $T_{1/2}$[b] | XREF | Comments |
|---|---|---|---|---|
| 2866.4 *14* | 1/2+ | | Fg | Jπ: L(d,p)=0. |
| 2929.4 *13* | | | C | |
| 3060.9 *13* | 3/2+ | | FG | Jπ: L=2 and analyzing power In (pol d,p). |
| 3079.4? *18* | (3/2+,5/2+) | | F | Jπ: L(d,p)=2 for an uncertain level. |
| 3113.9 *15* | 1/2+ | | F | Jπ: L=0 and analyzing power In (pol d,p). |
| 3139.2 *9* | (9/2+ to 15/2+) | 0.31 ps *+10−3* | C | Jπ: gammas to (11/2+) and (13/2+); RUL. |
| 3153.5 *22* | 1/2+ | | FG | Jπ: L(d,p)=0. |
| 3193.0 *4* | (15/2,17/2+) | 0.19 ps *3* | CD | Jπ: γ to (13/2+); RUL. |
| 3285.1 *19* | (1/2+) | | F | Jπ: L(d,p)=(0). |
| 3300.4 *21* | (7/2+,9/2,11/2−) | | F | Jπ: L(d,p)=(4,5). |
| 3320.4 *21* | 7/2+,9/2+ | | F | Jπ: L(d,p)=4. |
| 3340.6 *19* | 3/2+,5/2+ | | Fg | Jπ: L(d,p)=2. |
| 3355.8 *19* | (1/2+) | | Fg | Jπ: L(d,p)=(0). |
| 3402.0 *18* | (1/2+,7/2+,9/2+) | | Fg | Jπ: L(d,p)=(4,0). |
| 3412.8 *9* | (13/2−)[&] | 0.69 ps *21* | C | Jπ: ΔJ=1, dipole γ to (11/2+). |
| 3420.2 *19* | (1/2+,7/2+,9/2+) | | Fg | Jπ: L(d,p)=(4,0). |
| 3470.6 *17* | (7/2+,9/2,11/2−) | | F | Jπ: L(d,p)=(4,5). |
| 3535.4[c] *2* | (17/2−) | | D | Jπ: ΔJ=(0) transition to (17/2+). |
| 3545.9 *22* | | | Fg | |
| 3575.4 *24* | 3/2+,5/2+ | | Fg | Jπ: L(d,p)=2. |
| 3592.2 *23* | 3/2+,5/2+ | | Fg | Jπ: L(d,p)=2. |
| 3638.0 *17* | 1/2+ | | F | Jπ: L(d,p)=0. |
| 3729 *3* | 1/2+ | | Fg | Jπ: L(d,p)=0. |
| 3745 *3* | 3/2+,5/2+ | | Fg | Jπ: L(d,p)=2. |
| 3802 *3* | 3/2+,5/2+ | | F | Jπ: L(d,p)=2. |
| 3804.4[c] *3* | (19/2−) | | CD | Jπ: ΔJ=1, D+Q γ to (17/2−); γ to (17/2+). |
| 3872.8 *22* | | | F | |
| 3912.1 *18* | | | F | |
| 3927.1 *20* | 1/2+ | | F | Jπ: L(d,p)=0. |
| 3945.3 *20* | | | F | |
| 3974.9 *21* | | | Fg | |
| 4033.0 *23* | 3/2+,5/2+ | | Fg | Jπ: L(d,p)=2. |
| 4046.3 *24* | | | Fg | |
| 4111.4[c] *3* | (21/2−) | | CD | Jπ: ΔJ=1, dipole γ to (19/2−). |
| 4146 *10* | 1/2+ | | F | Jπ: L(d,p)=0. |
| 4335 *10* | 3/2+,5/2+ | | F | Jπ: L(d,p)=2. |
| 4450 *10* | 3/2+,5/2+ | | F | Jπ: L(d,p)=2. |
| 4547 *10* | 3/2+,5/2+ | | F | Jπ: L(d,p)=2. |
| 4623 *10* | | | F | |
| 4692 *10* | | | F | |
| 4790.6[c] *4* | (23/2−) | | D | Jπ: ΔJ=1, D+Q γ to (21/2−). |
| 7112.81[#] | 1/2+ [@] | | E | |
| 7113.45[#] | (1/2−)[@] | | E | |
| 7113.69[#] | 1/2+ [@] | | E | |
| 7114.49[#] | 1/2+ [@] | | E | |
| 7115.05[#] | | | E | |
| 7117.54[#] | 1/2+ [@] | | E | |
| 7117.88[#] | | | E | |
| 7119.02[#] | | | E | |
| 7120.51[#] | | | E | |
| 7123.13[#] | 1/2+ [@] | | E | |
| 7123.54[#] | | | E | |

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## Adopted Levels, Gammas (continued)

### $^{85}$Kr Levels (continued)

| E(level)[†] | J$^{\pi}$ | XREF | E(level)[†] | J$^{\pi}$ | XREF |
|---|---|---|---|---|---|
| 7125.67[#] | | E | 7159.69[#] | | E |
| 7125.97[#] | | E | 7160.05[#] | | E |
| 7126.87[#] | | E | 7160.76[#] | 1/2+[@] | E |
| 7127.57[#] | | E | 7161.70[#] | | E |
| 7128.79[#] | 1/2+[@] | E | 7161.90[#] | | E |
| 7129.38[#] | | E | 7162.00[#] | | E |
| 7130.85[#] | | E | 7162.92[#] | | E |
| 7131.41[#] | | E | 7163.62[#] | 1/2+[@] | E |
| 7132.04[#] | | E | 7166.39[#] | | E |
| 7133.88[#] | 1/2[@] | E | 7166.48[#] | | E |
| 7134.02[#] | | E | 7167.71[#] | | E |
| 7135.29[#] | | E | 7170.00[#] | | E |
| 7136.30[#] | 1/2+[@] | E | 7170.55[#] | | E |
| 7136.37[#] | | E | 7171.57[#] | | E |
| 7136.48[#] | | E | 7172.09[#] | | E |
| 7136.65[#] | | E | 7172.27[#] | | E |
| 7136.98[#] | | E | 7172.90[#] | 1/2+[@] | E |
| 7138.11[#] | 1/2+[@] | E | 7174.18[#] | | E |
| 7138.21[#] | | E | 7174.63[#] | | E |
| 7138.92[#] | | E | 7175.59[#] | | E |
| 7139.61[#] | | E | 7175.73[#] | | E |
| 7140.27[#] | | E | 7176.72[#] | | E |
| 7141.06[#] | | E | 7177.87[#] | 1/2+[@] | E |
| 7141.84[#] | | E | 7178.22[#] | | E |
| 7142.98[#] | | E | 7180.33[#] | | E |
| 7144.01[#] | | E | 7181.28[#] | | E |
| 7144.93[#] | 1/2+[@] | E | 7181.29[#] | 1/2+[@] | E |
| 7145.83[#] | | E | 7182.31[#] | | E |
| 7146.04[#] | | E | 7182.40[#] | | E |
| 7146.18[#] | | E | 7183.74[#] | | E |
| 7146.49[#] | | E | 7184.95[#] | | E |
| 7146.57[#] | | E | 7185.28[#] | | E |
| 7147.14[#] | | E | 7186.03[#] | | E |
| 7148.73[#] | | E | 7186.77[#] | | E |
| 7150.47[#] | 1/2+[@] | E | 7186.78[#] | 1/2+[@] | E |
| 7151.58[#] | | E | 7188.27[#] | | E |
| 7152.01[#] | | E | 7189.77[#] | | E |
| 7152.40[#] | | E | 7189.97[#] | | E |
| 7152.88[#] | 1/2+[@] | E | 7190.32[#] | | E |
| 7155.49[#] | | E | 7190.79[#] | | E |
| 7155.80[#] | | E | 7191.05[#] | | E |
| 7156.01[#] | | E | 7192.19[#] | | E |
| 7156.38[#] | | E | 7192.54[#] | | E |
| 7157.29[#] | | E | 7192.99[#] | | E |
| 7158.94[#] | | E | 7193.17[#] | | E |

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## Adopted Levels, Gammas (continued)

### $^{85}$Kr Levels (continued)

| E(level)[†] | $J^\pi$ | XREF | Comments |
|---|---|---|---|
| 7196.29[#] | | E | |
| 7197.19[#] | | E | |
| 7197.46[#] | $1/2^+$[@] | E | |
| 7197.64[#] | | E | |
| 7198.72[#] | | E | |
| 7199.15[#] | | E | |
| 7199.57[#] | | E | |
| 7200.13[#] | | E | |
| 7200.99[#] | | E | |
| 7201.52[#] | $1/2^+$[@] | E | |
| 7201.52[#] | | E | |
| 7202.84[#] | | E | |
| 7203.21[#] | | E | |
| 7203.56[#] | | E | |
| 7204.40[#] | | E | |
| 7205.14[#] | | E | |
| 7205.39[#] | | E | |
| 7206.92[#] | | E | |
| 7207.50[#] | | E | |
| 7207.77[#] | | E | |
| 7208.79[#] | | E | |
| 7209.08[#] | | E | |
| 7210.09[#] | | E | |
| 7211.08[#] | | E | |
| 7212.26[#] | | E | |
| 7212.58[#] | | E | |
| 7213.31[#] | | E | |
| 7213.74[#] | | E | |
| 7213.93[#] | | E | |
| 7215.43[#] | | E | |
| 7216.97[#] | | E | |
| 7218.20[#] | | E | |
| 7218.91[#] | | E | |
| 7219.82[#] | | E | |
| 7220.12[#] | | E | |
| 7221.01[#] | | E | |
| 7222.01[#] | | E | |
| 7222.50[#] | | E | |
| 12900 | $(3/2^-)$ | G | E(level),$J^\pi$: isobaric analog state of g.s., $3/2^-$ in $^{85}$Br. |
| 13300 | $(5/2^-)$ | G | E(level),$J^\pi$: isobaric analog state of 345, $5/2^-$ in $^{85}$Br. |
| 14200 | $(1/2^-)$ | G | E(level),$J^\pi$: isobaric analog state of 1191, $(1/2)^-$ in $^{85}$Br; it could also be 1427, $(7/2^-)$ in $^{85}$Br. |

† From least-squares fit to Eγ data.
‡ From (d,p).

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## Adopted Levels, Gammas (continued)

### $^{85}$Kr Levels (continued)

[#] Excitation energy deduced from neutron resonance. Absolute energy uncertainty is 2 keV, same as in S(n) for $^{85}$Kr.
[@] From s-wave (or p-wave in two cases) assignment for neutron resonance.
[&] From $\gamma(\theta)$ in ($\alpha$,n$\gamma$).
[a] $J^{\pi}$=(3/2$^+$,5/2$^+$) from L=(2) in (d,p) for the 2513 and/or the 2534 level.
[b] From DSAM in ($\alpha$,n$\gamma$), unless indicated otherwise.
[c] Band(A): $\gamma$ cascade based on (17/2$^-$).

## Adopted Levels, Gammas (continued)

### $\gamma(^{85}$Kr)

| $E_i$(level) | $J^\pi_i$ | $E_\gamma$† | $I_\gamma$† | $E_f$ | $J^\pi_f$ | Mult.# | $\delta$# | $\alpha$@ | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 304.871 | 1/2$^-$ | 304.87 *2* | 100 | 0.0 | 9/2$^+$ | M4 | | 0.511 | $\alpha$(K)=0.434; $\alpha$(L)= 0.0658; $\alpha$(M)=0.01089; $\alpha$(N)=0.001043<br>B(M4)(W.u.)=11.2 *3*<br>$E_\gamma$,Mult.: from IT decay. |
| 1107.32 | 1/2$^-$,3/2$^-$ | 802.41 *10* | 100 | 304.871 | 1/2$^-$ | | | | |
| 1140.73 | 5/2$^+$ | 1140.78 *9* | 100 | 0.0 | 9/2$^+$ | [E2] | | | B(E2)(W.u.)=3.8 *+15−31* |
| 1166.69 | (1/2,3/2,5/2$^-$) | 861.76 *8* | 100 | 304.871 | 1/2$^-$ | | | | |
| 1223.98 | (5/2$^-$) | 919.06 *8* | 100 | 304.871 | 1/2$^-$ | (E2) | | | B(E2)(W.u.)=16 *+3−4* |
| 1342.61 | (3/2$^+$) | 175.91 *7* | 56 *3* | 1166.69 | (1/2,3/2,5/2$^-$) | | | | |
| | | 201.87 *9* | 23.1 *18* | 1140.73 | 5/2$^+$ | | | | |
| | | 235.58 *25* | 8.3 *26* | 1107.32 | 1/2$^-$,3/2$^-$ | | | | |
| | | 1037.83 *8* | 100 *8* | 304.871 | 1/2$^-$ | | | | |
| 1416.57 | (5/2$^+$) | 249.94 *10* | 30.9 *17* | 1166.69 | (1/2,3/2,5/2$^-$) | [E1] | | | B(E1)(W.u.)=0.0126 *24* |
| | | 1416.48 *13* | 100 *8* | 0.0 | 9/2$^+$ | (E2) | | | B(E2)(W.u.)=8.1 *16* |
| 1430.6 | 1/2$^+$ | 1125.7‡ | | 304.871 | 1/2$^-$ | | | | |
| 1611.6 | (11/2$^+$) | 1611.6‡ *1* | 100 | 0.0 | 9/2$^+$ | (M1+E2) | −0.85 *15* | | B(M1)(W.u.)=0.025 *8*; B(E2)(W.u.)=8 *3* |
| 1847.0 | (7/2$^+$) | 430.4‡ | 8.4 | 1416.57 | (5/2$^+$) | (M1(+E2)) | +0.03 *7* | | B(M1)(W.u.)=0.27 *+7−10*; B(E2)(W.u.)=2 *+7−2* |
| | | 1847.1‡ | 100 | 0.0 | 9/2$^+$ | (M1+E2) | +1.7 *13* | | B(M1)(W.u.)=0.010 *+12−10*; B(E2)(W.u.)=10 *+5−6* |
| 1873.52 | (5/2)$^+$ | 531.1‡ | 100 | 1342.61 | (3/2$^+$) | (M1+E2) | +0.07 *3* | | B(M1)(W.u.)=0.7 *5*; B(E2)(W.u.)=14 *+16−14* |
| 1931.6 | (13/2$^+$) | 319.9 *4* | 2.9 | 1611.6 | (11/2$^+$) | (M1+E2) | +0.05 *2* | | B(M1)(W.u.)=0.057 *7*; B(E2)(W.u.)=1.6 *13* |
| | | 1931.6 *1* | 100 | 0.0 | 9/2$^+$ | (E2) | | | B(E2)(W.u.)=2.8 *4* |
| 1938.83 | (1/2$^+$,3/2,5/2) | 771.71 *33* | 24 *7* | 1166.69 | (1/2,3/2,5/2$^-$) | | | | |
| | | 798.35 *18* | 93 *12* | 1140.73 | 5/2$^+$ | | | | |
| | | 831.48 *7* | 100 *10* | 1107.32 | 1/2$^-$,3/2$^-$ | | | | |
| 1990.1 | (9/2$^+$) | 378.6‡ | 17 | 1611.6 | (11/2$^+$) | (M1+E2) | +0.13 *5* | | B(M1)(W.u.)=0.25 *4*; B(E2)(W.u.)=30 *+30−20* |
| | | 1990.0‡ | 100 | 0.0 | 9/2$^+$ | (M1+E2) | −0.24 *8* | | B(M1)(W.u.)=0.0098 *14*; B(E2)(W.u.)=0.17 *11* |
| 1991.8 | (17/2$^+$) | 60.2 *2* | 100 | 1931.6 | (13/2$^+$) | E2 | | 5.94 *11* | $\alpha$(K)=4.79 *9*; $\alpha$(L)=0.98 *2*; $\alpha$(M)=0.159 *4*; $\alpha$(N)=0.0135 *3*<br>B(E2)(W.u.)=2.55 *10* |
| 2004.4 | (7/2$^+$) | 588.3‡ | | 1416.57 | (5/2$^+$) | | | | |
| | | 2003.8‡ | 100 | 0.0 | 9/2$^+$ | (M1+E2) | +0.63 *20* | | B(M1)(W.u.)=0.0093 *25*; B(E2)(W.u.)=1.1 *6*<br>B(M1)(W.u.),B(E2)(W.u.) Under the assumption that I$\gamma$(588)≤I$\gamma$(2004). |
| 2031.96 | 1/2$^-$,3/2$^-$,5/2$^-$ | 689.39 *8* | 2.5 *4* | 1342.61 | (3/2$^+$) | | | | |
| | | 865.22 *8* | 10.9 *6* | 1166.69 | (1/2,3/2,5/2$^-$) | | | | |
| | | 924.63 *8* | 100 *5* | 1107.32 | 1/2$^-$,3/2$^-$ | | | | |
| | | 1727.02 *11* | 23.4 *10* | 304.871 | 1/2$^-$ | | | | |
| 2113.4 | (9/2$^+$) | 501.6‡ | | 1611.6 | (11/2$^+$) | | | | |
| | | 2113.6‡ | 100 | 0.0 | 9/2$^+$ | (M1+E2) | +0.40 *25* | | B(M1)(W.u.)=0.0032 *7*; B(E2)(W.u.)=0.13 |





$^{85}_{36}$Kr$_{49}$-7

γ($^{85}$Kr) (continued)

| $E_i$(level) | $J^\pi_i$ | $E_\gamma$† | $I_\gamma$† | $E_f$ | $J^\pi_f$ | Mult.# | δ# | α@ | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | +15−13<br>B(M1)(W.u.),B(E2)(W.u.) Under the assumption that Iγ(502)≤Iγ(2114). |
| 2135.1 | (9/2$^+$) | 2135.1‡ | 100 | 0.0 | 9/2$^+$ | (M1(+E2)) | +0.10 16 | | B(M1)(W.u.)=0.0102 15; B(E2)(W.u.)=0.03 +9−3 |
| 2137.34 | (3/2,5/2)$^-$ | 263.84 17 | 7.1 22 | 1873.52 | (5/2)$^+$ | [E1] | | | B(E1)(W.u.)=0.0010 6 |
| | | 794.78 10 | 69 5 | 1342.61 | (3/2$^+$) | [E1] | | | B(E1)(W.u.)=0.00036 16 |
| | | 913.31 9 | 90 6 | 1223.98 | (5/2$^-$) | | | | if M1, B(M1)(W.u.)=0.020 10. If E2, B(E2)(W.u.)=26 12. |
| | | 1029.65 26 | 15 3 | 1107.32 | 1/2$^-$,3/2$^-$ | | | | if M1, B(M1)(W.u.)=0.0022 12. If E2, B(E2)(W.u.)=2.4 12. |
| | | 1832.50 10 | 100 5 | 304.871 | 1/2$^-$ | | | | if M1, B(M1)(W.u.)=0.0026 12. If E2, B(E2)(W.u.)=0.92 42. |
| 2144.9 | (7/2$^+$) | 271.2‡ | 29 | 1873.52 | (5/2)$^+$ | (M1(+E2)) | −0.06 6 | 0.0094 | B(M1)(W.u.)=0.64 13; B(E2)(W.u.)=4.E+1 +8−4 |
| | | 1004.7‡ | 31 | 1140.73 | 5/2$^+$ | (M1+E2) | −0.8 7 | | B(M1)(W.u.)=0.008 6; B(E2)(W.u.)=6 +7−6 |
| | | 2144.6‡ | 100 | 0.0 | 9/2$^+$ | (M1+E2) | −0.21 5 | | B(M1)(W.u.)=0.0043 9; B(E2)(W.u.)=0.048 24 |
| 2235.2 | | 2235.2‡ | 100 | 0.0 | 9/2$^+$ | | | | |
| 2383.5 | (7/2$^+$) | 2383.5‡ | 100 | 0.0 | 9/2$^+$ | (M1+E2) | +0.3 1 | | B(M1)(W.u.)=0.019 7; B(E2)(W.u.)=0.34 25 |
| 2497.9 | (9/2$^-$) | 886.3‡ | | 1611.6 | (11/2$^+$) | | | | |
| | | 1274.0‡ | 100 | 1223.98 | (5/2$^-$) | (E2) | | | |
| 2534.3 | (3/2$^+$,5/2$^+$) | 1367.7‡ | | 1166.69 | (1/2,3/2,5/2$^-$) | | | | |
| | | 1427.1‡ | | 1107.32 | 1/2$^-$,3/2$^-$ | | | | |
| 2602.4 | | 598.0‡ | 100 | 2004.4 | (7/2$^+$) | | | | |
| 2617.9 | | 742.2‡ | | 1873.52 | (5/2)$^+$ | | | | |
| | | 1475.6‡ | | 1140.73 | 5/2$^+$ | | | | |
| 2636.7 | (11/2$^+$) | 523.3‡ | 100 | 2113.4 | (9/2$^+$) | (M1+E2) | −0.11 4 | | B(M1)(W.u.)=0.89 16; B(E2)(W.u.)=50 40 |
| 2784.5 | | 639.6‡ | | 2144.9 | (7/2$^+$) | | | | |
| 2814.9 | (9/2$^+$) | 967.9‡ | 100 | 1847.0 | (7/2$^+$) | (M1+E2) | +0.04 2 | | B(M1)(W.u.)=0.10 3; B(E2)(W.u.)=0.20 +21−20 |
| 2929.4 | | 816.0‡ | 100 | 2113.4 | (9/2$^+$) | | | | |
| 3139.2 | (9/2$^+$ to 15/2$^+$) | 1207.9‡ | | 1931.6 | (13/2$^+$) | | | | |
| | | 1527.4‡ | | 1611.6 | (11/2$^+$) | | | | |
| 3193.0 | (15/2,17/2$^+$) | 1261.3‡ 4 | 100 | 1931.6 | (13/2$^+$) | | | | if E2, B(E2)(W.u.)=42 7. |
| 3412.8 | (13/2$^-$) | 915.0‡ | | 2497.9 | (9/2$^-$) | | | | |
| | | 1801.1‡ | 100 | 1611.6 | (11/2$^+$) | (E1(+M2)) | +0.03 3 | | B(E1)(W.u.)=9.E−5 3; B(M2)(W.u.)=0.11 +23−11 |
| 3535.4 | (17/2$^-$) | 342.4 4 | ≈4 | 3193.0 | (15/2,17/2$^+$) | | | | |
| | | 1543.6 1 | 100 | 1991.8 | (17/2$^+$) | D | | | |

## Adopted Levels, Gammas (continued)

### $\gamma(^{85}Kr)$ (continued)

| $E_i$(level) | $J^{\pi}_i$ | $E_{\gamma}$† | $I_{\gamma}$† | $E_f$ | $J^{\pi}_f$ | Mult.# |
|---|---|---|---|---|---|---|
| 3804.4 | (19/2⁻) | 269.0 *1* | 100 | 3535.4 | (17/2⁻) | D+Q |
| | | 1812.6 *2* | 54 | 1991.8 | (17/2⁺) | |
| 4111.4 | (21/2⁻) | 307.0 *1* | 100 | 3804.4 | (19/2⁻) | D |
| 4790.6 | (23/2⁻) | 679.2 *2* | 100 | 4111.4 | (21/2⁻) | D+Q |

† The values represent averages of all available data.

‡ From ($\alpha$,n$\gamma$).

# From $\gamma(\theta)$ data in $^{82}$Se($\alpha$,n$\gamma$); and for selected transitions in $^{82}$Se($^{7}$Li,p3n$\gamma$).

@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on $\gamma$-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.



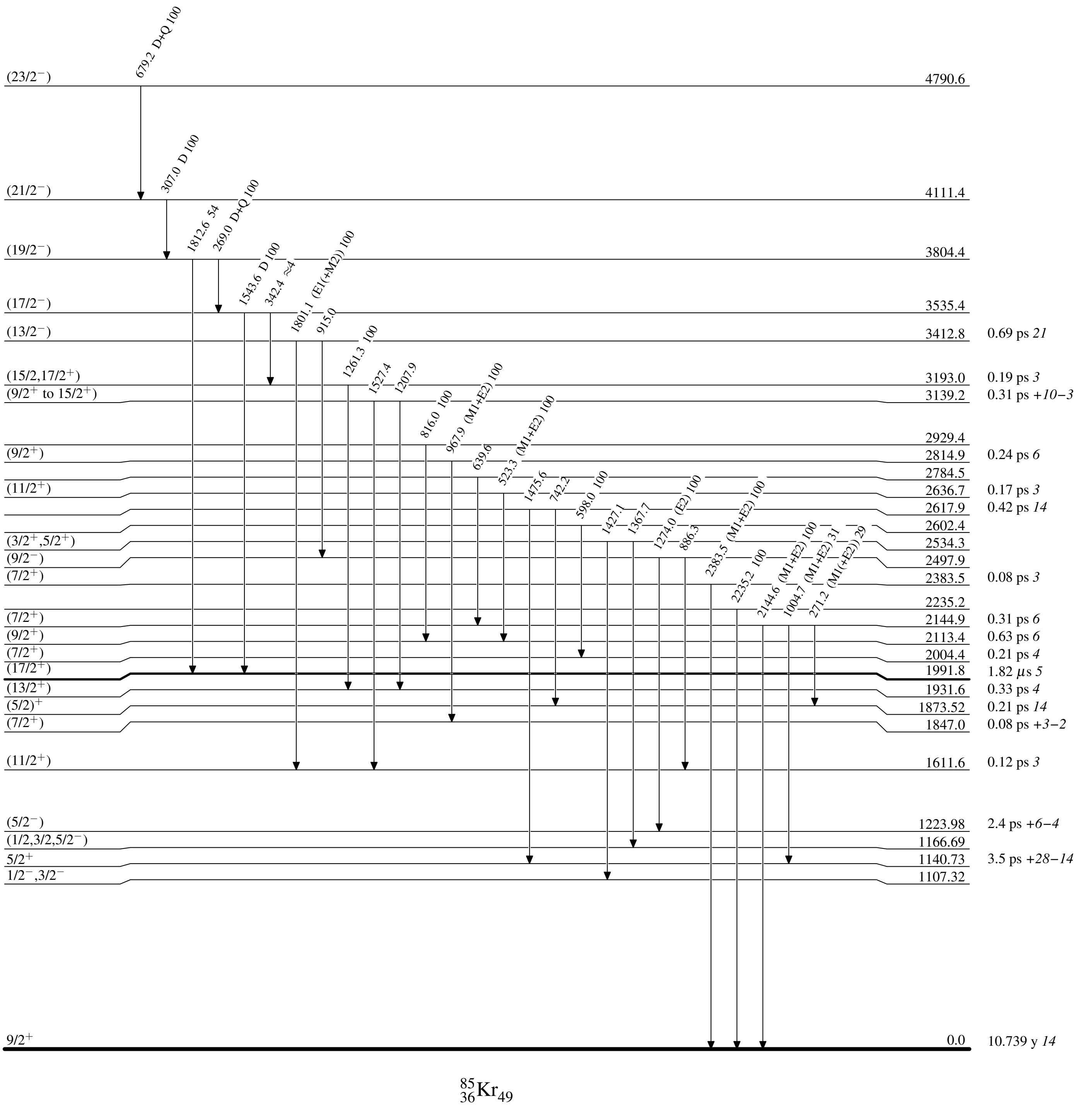


$^{85}_{36}Kr_{49}$-9

**Adopted Levels, Gammas**

Level Scheme

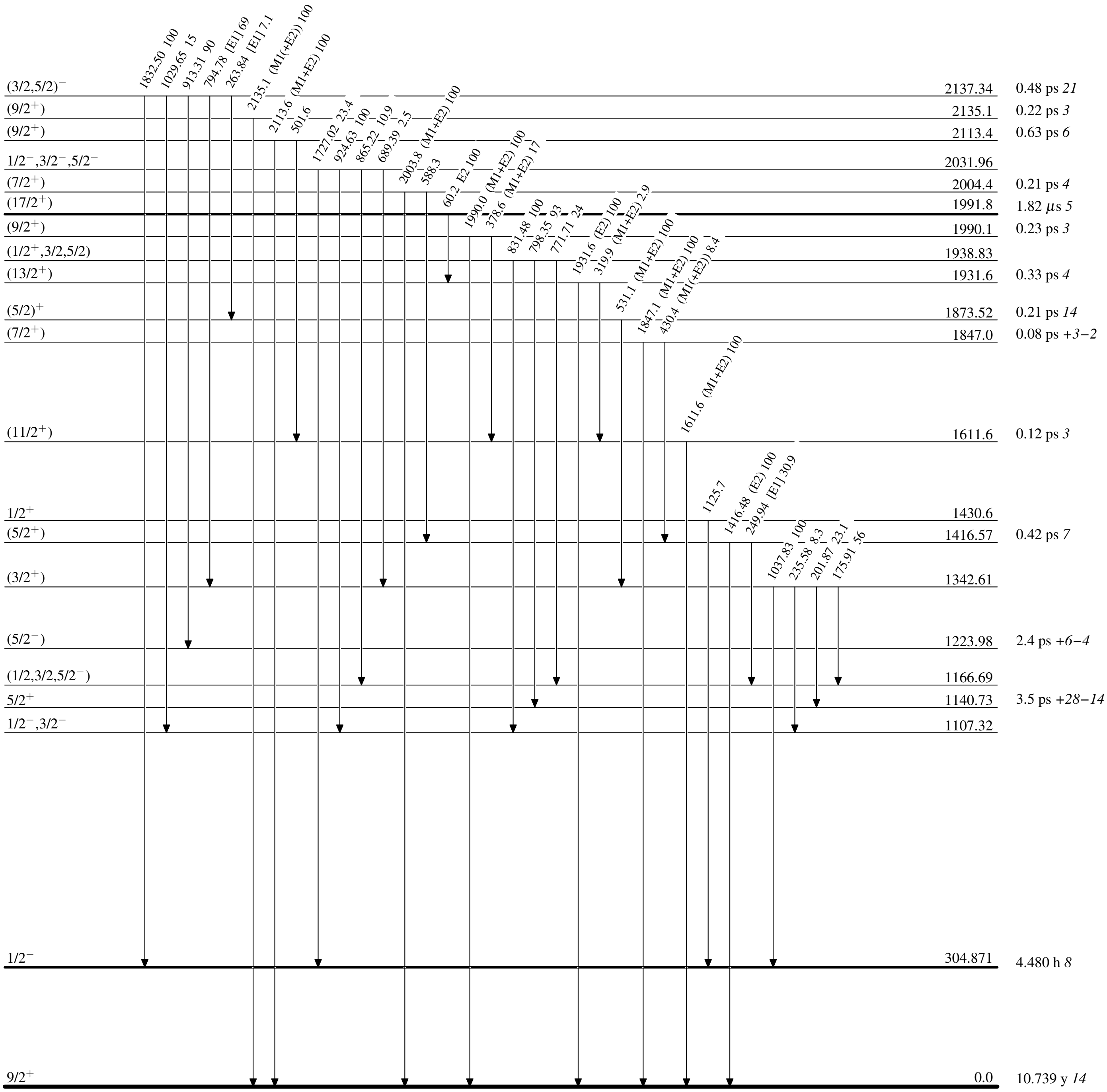
Intensities: Relative photon branching from each level



## Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

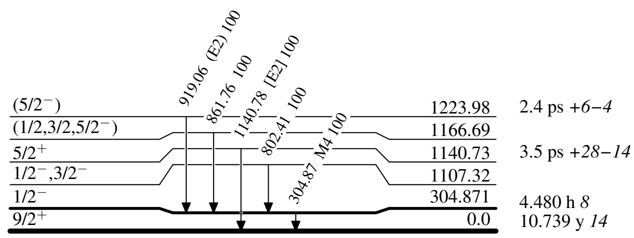



$^{85}_{36}Kr_{49}$

**Adopted Levels, Gammas**

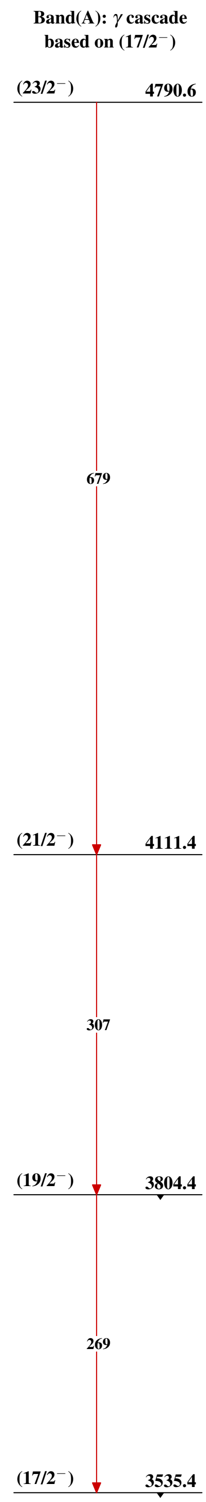
Level Scheme (continued)

Intensities: Relative photon branching from each level




$^{85}_{36}Kr_{49}$

## Adopted Levels, Gammas




$^{85}_{36}Kr_{49}$