## $^{58}$Ni($^{32}$S,3pn$\gamma$) 2000Wi10,1997Ta10,1999Co10

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Alexandru Negret, Balraj Singh | NDS 124, 1 (2015) | 30-Nov-2014 |

Includes 1998Ka19.

1997Ta10: E=135 MeV. Measured E$\gamma$, I$\gamma$, $\gamma\gamma$ and $\gamma\gamma(\theta)$(DCO) using Gammasphere, an array consisting of 36 Compton-suppressed Ge detectors, in conjunction with Microball, a 95-element detector array.

2000Wi10: E=135 MeV. Measured lifetimes by DSAM using Gammasphere array in conjunction with Microball.

1999Co10: E=130 MeV. Measured $\gamma$-ray linear polarization with a four- crystal Clover polarimeter, and $\gamma(\theta)$ with one HPGe detector.

1998Ka19: E=130 MeV. Measured lifetimes of two levels using RDM.

### $^{86}$Nb Levels

| E(level)[†] | J$^{\pi}$[‡] | T$_{1/2}$[#] | Comments |
|---|---|---|---|
| 0[&] | (6$^+$) | | Additional information 1. |
| 26.3 *4* | (7$^+$) | | J$^{\pi}$: from 1999Co10 and 2000Wi10. |
| 274.4[&] *3* | (8$^+$) | 0.84 ns *14* | J$^{\pi}$: from $\gamma$(lin pol) (1999Co10).<br>T$_{1/2}$: from RDM (1998Ka19). |
| 494.3[d] *3* | (6$^-$) | 0.25 ns *7* | J$^{\pi}$: from $\gamma$(lin pol) (1999Co10).<br>T$_{1/2}$: from RDM (1998Ka19). |
| 724.7[c] *4* | (9$^+$) | | |
| 887.7[e] *4* | (7$^-$) | | |
| 1134.1[&] *4* | (10$^+$) | | |
| 1283.8[d] *4* | (8$^-$) | | |
| 1498.4[h] *5* | (8$^-$) | | |
| 1601.1[c] *4* | (11$^+$) | 0.34 ps *+10−8* | |
| 1710.7[e] *4* | (9$^-$) | | |
| 2026.3[d] *4* | (10$^-$) | | |
| 2209.6[h] *11* | (10$^-$) | | |
| 2211.5[&] *5* | (12$^+$) | 0.46 ps *+8−6* | |
| 2454.8[e] *5* | (11$^-$) | | |
| 2599.1[g] *6* | (11$^-$) | | |
| 2684.0[c] *5* | (13$^+$) | 0.35 ps *+10−8* | |
| 2779.5[d] *5* | (12$^-$) | | |
| 3065.4[h] *15* | (12$^-$) | | |
| 3302.2[e] *5* | (13$^-$) | 0.45 ps *+7−6* | |
| 3377.5[g] *6* | (13$^-$) | 0.65 ps *+33−29* | |
| 3468.2[&] *6* | (14$^+$) | 0.35 ps *+10−8* | |
| 3687.4[d] *6* | (14$^-$) | 0.76 ps *+11−9* | |
| 3902.4[c] *6* | (15$^+$) | 0.34 ps *+6−4* | |
| 3987.4[b] *6* | (15$^+$) | 0.21 ps *+8−6* | |
| 4070.0[h] *6* | (14$^-$) | 0.45 ps *+26−21* | |
| 4317.9[e] *6* | (15$^-$) | 0.48 ps *+11−9* | |
| 4370.4[g] *6* | (15$^-$) | 0.62 ps *+9−8* | |
| 4777.2[d] *7* | (16$^-$) | 0.34 ps *+6−4* | |
| 4840.6[&] *8* | (16$^+$) | 0.52 ps *+19−17* | |
| 5027.5 *9* | (16$^+$) | | |
| 5153.2[h] *7* | (16$^-$) | 0.21 ps *+19−14* | |
| 5274.1[c] *7* | (17$^+$) | 0.30 ps *+8−6* | |
| 5307.8[b] *7* | (17$^+$) | 0.40 ps *+10−9* | |

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**$^{58}$Ni($^{32}$S,3pn$\gamma$) 2000Wi10,1997Ta10,1999Co10 (continued)**

$^{86}$Nb Levels (continued)

| E(level)[†] | J$^{\pi}$[‡] | $T_{1/2}$[#] | E(level)[†] | J$^{\pi}$[‡] | $T_{1/2}$[#] |
|---|---|---|---|---|---|
| 5441.9[e] *7* | (17$^-$) | 0.14 ps *+8−6* | 9064.8[d] *17* | (22$^-$) | 0.055 ps *14* |
| 5504.3[g] *8* | (17$^-$) | 0.32 ps *+8−6* | 9381.7[b] *19* | (23$^+$) | 0.22 ps *6* |
| 5532.9 *7* | (17$^+$) | | 9649[e] *4* | (23$^-$) | 0.23[@] ps *+8−6* |
| 5605.5[f] *12* | (17$^-$) | 0.14 ps *+12−11* | 9728.6[g] *18* | (23$^-$) | 0.055 ps *+21−14* |
| 6035.4[d] *10* | (18$^-$) | 0.132 ps *+28−21* | 9774[&] *3* | (22$^+$) | |
| 6361.5[&] *11* | (18$^+$) | | 10052.5[c] *25* | (23$^+$) | 0.11 ps *+7−6* |
| 6479.3[e] *11* | (19$^-$) | 1.25 ps *+27−21* | 10430[a] *5* | (23$^+$) | 0.08[@] ps *+5−4* |
| 6644.9[b] *8* | (19$^+$) | 0.55 ps *+16−14* | 10866.5[d] *21* | (24$^-$) | 0.042 ps *+21−14* |
| 6722.1[c] *11* | (19$^+$) | 0.19 ps *+11−9* | 11283[b] *3* | (25$^+$) | 0.07 ps *+4−3* |
| 6807.7[g] *12* | (19$^-$) | 0.17 ps *+4−3* | 11456.9[g] *21* | (25$^-$) | 0.083 ps *+28−21* |
| 6957.6[a] *13* | (19$^+$) | 0.50 ps *+24−18* | 12013[c] *4* | (25$^+$) | 0.042[@] ps *+28−21* |
| 6972.6[f] *16* | (19$^-$) | 0.25 ps *+6−5* | 12407?[a] *3* | (25$^+$) | |
| 7460.7[d] *14* | (20$^-$) | 0.13 ps *+5−3* | 12886[d] *4* | (26$^-$) | 0.021[@] ps *+21−14* |
| 7665.3 *12* | (20$^+$) | | 13417[g] *3* | (27$^-$) | 0.042[@] ps *14* |
| 7819.3[e] *14* | (21$^-$) | 0.79 ps *+19−16* | 13509[b] *4* | (27$^+$) | 0.062[@] ps *+28−21* |
| 7906.2[b] *13* | (21$^+$) | 0.45 ps *+15−14* | 13568 *4* | (27$^+$) | 0.06[@] ps *+4−3* |
| 7965.5[&] *19* | (20$^+$) | | 15095[d] *5* | (28$^-$) | |
| 8214.1[g] *15* | (21$^-$) | 0.125 ps *+28−21* | 15662[g] *4* | (29$^-$) | |
| 8270.1[c] *19* | (21$^+$) | 0.12 ps *+7−5* | 18058[g] *5* | (31$^-$) | |
| 8429[f] *3* | (21$^-$) | 0.16[@] ps *+6−5* | 20786?[g] *3* | (33$^-$) | |
| 8603[a] *4* | (21$^+$) | 0.30 ps *+15−11* | | | |

[†] From least-squares fit to E$\gamma$ values. Arguments for assuming 6$^+$ as the g.s. of $^{86}$Nb are given by 1999Co10.
[‡] From 1997Ta10 based on $\gamma\gamma(\theta)$(DCO) data and band associations, unless otherwise stated. The parentheses in most cases are added by the evaluator due to lack of strong arguments for these assignments.
[#] From DSA measurements of 2000Wi10, unless otherwise stated.
[@] Effective half-life (2000Wi10), not corrected for side feeding.
[&] Band(A): band based on (6$^+$).
[a] Band(B): band based on (19$^+$).
[b] Band(C): band based on (15$^+$).
[c] Band(D): band based on (9$^+$).
[d] Band(E): band based on (6$^-$).
[e] Band(F): band based on (7$^-$).
[f] Band(G): band based on (17$^-$).
[g] Band(H): band based on (11$^-$).
[h] Band(I): band based on (8$^-$ ).

$\gamma$($^{86}$Nb)

| E$_\gamma$[†] | I$_\gamma$[†] | E$_i$(level) | J$^{\pi}_i$ | E$_f$ | J$^{\pi}_f$ | Mult.[‡] | $\delta$[‡] | $\alpha$[#] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 26.4[@] | | 26.3 | (7$^+$) | 0 | (6$^+$) | | | | |
| 214.7 *5* | 2.5 *9* | 1498.4 | (8$^-$) | 1283.8 | (8$^-$) | | | | Additional information 2. |
| 225.1 *4* | 2.0 *7* | 5532.9 | (17$^+$) | 5307.8 | (17$^+$) | | | | |
| 240.9 *8* | 3.3 *9* | 7906.2 | (21$^+$) | 7665.3 | (20$^+$) | D | | | DCO=0.52 *12*. |
| 248.1 *3* | 49.6 *15* | 274.4 | (8$^+$) | 26.3 | (7$^+$) | M1+E2 | 0.066 | 0.0199 | $\alpha$(K)=0.0175 *3*; $\alpha$(L)=0.00201 *3*; $\alpha$(M)=0.000354 *5*; $\alpha$(N+..)=5.47×10$^{-5}$ *8* |

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**$^{58}Ni(^{32}S,3pn\gamma)$ 2000Wi10,1997Ta10,1999Co10 (continued)**

$\gamma(^{86}Nb)$ (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. [‡] | $\alpha$ [#] | Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | $\alpha$(N)=5.18×10$^{-5}$ *8*; $\alpha$(O)=2.97×10$^{-6}$ *5*<br>DCO=0.59 *3*.<br>$A_2$=−0.411 *25*, $A_4$=−0.032 *26*. POL=−0.29 *11* (1999Co10). |
| 258.8 *4* | 2.6 *8* | 5532.9 | (17$^+$) | 5274.1 | (17$^+$) | | | |
| 274.5 *3* | 63.5 *15* | 274.4 | (8$^+$) | 0 | (6$^+$) | E2 | 0.0310 | $\alpha$(K)=0.0269 *4*; $\alpha$(L)=0.00345 *5*; $\alpha$(M)=0.000609 *9*; $\alpha$(N+..)=9.09×10$^{-5}$ *14*<br>$\alpha$(N)=8.67×10$^{-5}$ *13*; $\alpha$(O)=4.20×10$^{-6}$ *6*<br>DCO=0.82 *4*.<br>$A_2$=+0.272 *30*, $A_4$=−0.024 *31*. POL=+0.67 *7* (1999Co10). |
| 288.7 *4* | 6.0 *15* | 5441.9 | (17$^-$) | 5153.2 | (16$^-$) | D | | DCO=0.54 *10*. |
| 300.3 *4* | 5 *1* | 4370.4 | (15$^-$) | 4070.0 | (14$^-$) | D | | DCO=0.62 *17*. |
| 315.7 *3* | 15.0 *5* | 2026.3 | (10$^-$) | 1710.7 | (9$^-$) | D | | DCO=0.47 *5*. |
| 324.6 *3* | 22.1 *15* | 2779.5 | (12$^-$) | 2454.8 | (11$^-$) | D | | DCO=0.49 *13*. |
| 360.6 *4* | 1.3 *3* | 6722.1 | (19$^+$) | 6361.5 | (18$^+$) | | | |
| 385.3 *4* | 16.7 *15* | 3687.4 | (14$^-$) | 3302.2 | (13$^-$) | D | | DCO=0.52 *10*. |
| 393.3 *3* | 36.0 *14* | 887.7 | (7$^-$) | 494.3 | (6$^-$) | D | | DCO=0.42 *5*. |
| 396.1 *3* | 14.2 *12* | 1283.8 | (8$^-$) | 887.7 | (7$^-$) | D | | DCO=0.47 *5*. |
| 409.4 *3* | 5.5 *7* | 1134.1 | (10$^+$) | 724.7 | (9$^+$) | D | | DCO=0.45 *5*. |
| 427.1 *5* | 10 *3* | 1710.7 | (9$^-$) | 1283.8 | (8$^-$) | (D) | | DCO=0.48 *5* for 427.1+428.2. |
| 428.2 *6* | 10 *3* | 2454.8 | (11$^-$) | 2026.3 | (10$^-$) | (D) | | DCO=0.48 *5* for 427.1+428.2. |
| 434.0 *5* | 5.3 *12* | 3902.4 | (15$^+$) | 3468.2 | (14$^+$) | D | | DCO=0.47 *10*. |
| 434 *1* | 3 *1* | 5274.1 | (17$^+$) | 4840.6 | (16$^+$) | | | |
| 444 [@] | | 6479.3 | (19$^-$) | 6035.4 | (18$^-$) | | | |
| 450.3 *3* | 20.3 *12* | 724.7 | (9$^+$) | 274.4 | (8$^+$) | D | | DCO=0.48 *5*. |
| 459.1 *5* | 6.2 *7* | 4777.2 | (16$^-$) | 4317.9 | (15$^-$) | D | | DCO=0.64 *9*. |
| 466.9 *3* | 27.7 *12* | 1601.1 | (11$^+$) | 1134.1 | (10$^+$) | D | | DCO=0.43 *4*. |
| 467.2 *7* | 9.5 *16* | 5307.8 | (17$^+$) | 4840.6 | (16$^+$) | | | |
| 472.4 *3* | 13.5 *18* | 2684.0 | (13$^+$) | 2211.5 | (12$^+$) | D | | DCO=0.42 *4*. |
| 494.2 *3* | 80.8 *15* | 494.3 | (6$^-$) | 0 | (6$^+$) | E1 | 0.001426 *20* | $\alpha$=0.001426 *20*; $\alpha$(K)=0.001258 *18*; $\alpha$(L)=0.0001395 *20*; $\alpha$(M)=2.45×10$^{-5}$ *4*; $\alpha$(N+..)=3.78×10$^{-6}$<br>$\alpha$(N)=3.58×10$^{-6}$ *5*; $\alpha$(O)=2.05×10$^{-7}$ *3*<br>DCO=0.92 *6*.<br>$A_2$=+0.029 *5*, $A_4$=+0.13 *5*. POL=−0.61 *15* (1999Co10). |
| 505.1 *8* | 4.8 *10* | 5532.9 | (17$^+$) | 5027.5 | (16$^+$) | | | |
| 519.4 *4* | 10.7 *13* | 3987.4 | (15$^+$) | 3468.2 | (14$^+$) | D | | DCO=0.48 *9*. |
| 522.8 *4* | 19.8 *15* | 3302.2 | (13$^-$) | 2779.5 | (12$^-$) | D | | DCO=0.54 *10*. |
| 573.0 *5* | 6.8 *10* | 2599.1 | (11$^-$) | 2026.3 | (10$^-$) | D | | DCO=0.57 *9*. |
| 594 *2* | 2.1 *4* | 6035.4 | (18$^-$) | 5441.9 | (17$^-$) | | | |
| 597.9 *7* | 9.7 *12* | 3377.5 | (13$^-$) | 2779.5 | (12$^-$) | D | | DCO=0.62 *9*. |
| 610.2 *4* | 9.3 *11* | 2211.5 | (12$^+$) | 1601.1 | (11$^+$) | | | |
| 610.5 *5* | 6.3 *9* | 1498.4 | (8$^-$) | 887.7 | (7$^-$) | D | | DCO=0.51 *10*. |
| 630.5 *5* | 10.8 *20* | 4317.9 | (15$^-$) | 3687.4 | (14$^-$) | D | | DCO=0.49 *6*. |
| 664.6 *7* | 5.2 *9* | 5441.9 | (17$^-$) | 4777.2 | (16$^-$) | D | | DCO=0.48 *9*. |
| 707.4 *9* | 1.2 *4* | 7665.3 | (20$^+$) | 6957.6 | (19$^+$) | | | |
| 711.2 *9* | 4.7 *8* | 2209.6 | (10$^-$) | 1498.4 | (8$^-$) | | | |
| 727 *2* | 1.8 *4* | 5504.3 | (17$^-$) | 4777.2 | (16$^-$) | | | |
| 742.2 *4* | 35 *8* | 2026.3 | (10$^-$) | 1283.8 | (8$^-$) | Q | | DCO=0.95 *8*. |
| 744.1 *7* | 15 *4* | 2454.8 | (11$^-$) | 1710.7 | (9$^-$) | Q | | DCO=0.92 *8*. |
| 753.2 *5* | 33.5 *25* | 2779.5 | (12$^-$) | 2026.3 | (10$^-$) | Q | | DCO=1.02 *13*. |
| 767.6 *4* | 6.8 *9* | 4070.0 | (14$^-$) | 3302.2 | (13$^-$) | | | |
| 778.7 *7* | 13.0 *13* | 3377.5 | (13$^-$) | 2599.1 | (11$^-$) | E2 | | DCO=1.04 *21*. |

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## $^{58}Ni(^{32}S,3pn\gamma)$ 2000Wi10,1997Ta10,1999Co10 (continued)

### $\gamma(^{86}Nb)$ (continued)

| $E_\gamma$ † | $I_\gamma$ † | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. ‡ | Comments |
|---|---|---|---|---|---|---|---|
| 783.1 *8* | 2.4 *4* | 5153.2 | (16⁻) | 4370.4 | (15⁻) | | |
| 784.5 *5* | 7.0 *19* | 3468.2 | (14⁺) | 2684.0 | (13⁺) | | |
| 789.6 *4* | 33.2 *15* | 1283.8 | (8⁻) | 494.3 | (6⁻) | Q | DCO=1.00 *9*. |
| 822.9 *3* | 23.2 *14* | 1710.7 | (9⁻) | 887.7 | (7⁻) | Q | DCO=1.10 *11*. |
| 835.2 *8* | 2.7 *5* | 5153.2 | (16⁻) | 4317.9 | (15⁻) | | |
| 847.3 *5* | 6.8 *10* | 3302.2 | (13⁻) | 2454.8 | (11⁻) | | |
| 855.8 *10* | 4.1 *10* | 3065.4 | (12⁻) | 2209.6 | (10⁻) | | |
| 859.8 *4* | 100 | 1134.1 | (10⁺) | 274.4 | (8⁺) | Q | DCO=0.91 *8*. |
| 876.5 *4* | 15.6 *10* | 1601.1 | (11⁺) | 724.7 | (9⁺) | E2 | DCO=0.95 *8*. |
| 892.4 *6* | 3.3 *4* | 2026.3 | (10⁻) | 1134.1 | (10⁺) | Q | DCO=0.98 *10*. |
| 907.7 *5* | 46.5 *20* | 3687.4 | (14⁻) | 2779.5 | (12⁻) | E2 | DCO=1.06 *8*. |
| 922.8 *8* | 14.7 *14* | 3377.5 | (13⁻) | 2454.8 | (11⁻) | E2 | DCO=1.10 *17*. |
| 993.1 *7* | 22.4 *25* | 4370.4 | (15⁻) | 3377.5 | (13⁻) | E2 | DCO=0.92 *8*. |
| 1015.6 *9* | 20 *4* | 4317.9 | (15⁻) | 3302.2 | (13⁻) | E2 | DCO=0.91 *7*. |
| 1020.6 *12* | 6.1 *18* | 7665.3 | (20⁺) | 6644.9 | (19⁺) | D | DCO=0.50 *14*. |
| 1037.4 *8* | 26.7 *22* | 6479.3 | (19⁻) | 5441.9 | (17⁻) | E2 | DCO=1.11 *14*. |
| 1071.2 *8* | 18.6 *27* | 5441.9 | (17⁻) | 4370.4 | (15⁻) | E2 | DCO=1.04 *11*. |
| 1077.6 *6* | 69.0 *20* | 2211.5 | (12⁺) | 1134.1 | (10⁺) | E2 | DCO=0.94 *8*. |
| 1083.1 *5* | 26.6 *20* | 2684.0 | (13⁺) | 1601.1 | (11⁺) | E2 | DCO=0.97 *9*. |
| 1083.1 *9* | 3.8 *7* | 5153.2 | (16⁻) | 4070.0 | (14⁻) | | |
| 1089.9 *6* | 35 *3* | 4777.2 | (16⁻) | 3687.4 | (14⁻) | E2 | DCO=0.98 *9*. |
| 1113 *2* | 3.1 *8* | 6644.9 | (19⁺) | 5532.9 | (17⁺) | | |
| 1124.5 *8* | 13.5 *16* | 5441.9 | (17⁻) | 4317.9 | (15⁻) | E2 | DCO=1.13 *11*. |
| 1124.8 *8* | 5.3 *15* | 5027.5 | (16⁺) | 3902.4 | (15⁺) | | |
| 1133.9 *8* | 13.4 *15* | 5504.3 | (17⁻) | 4370.4 | (15⁻) | E2 | DCO=1.04 *9*. |
| 1178.5 *6* | 8.3 *10* | 2779.5 | (12⁻) | 1601.1 | (11⁺) | | |
| 1186.5 *8* | 11.4 *14* | 5504.3 | (17⁻) | 4317.9 | (15⁻) | E2 | DCO=0.95 *9*. |
| 1218.4 *5* | 25.4 *14* | 3902.4 | (15⁺) | 2684.0 | (13⁺) | E2 | DCO=0.98 *7*. |
| 1256.4 *6* | 42.3 *25* | 3468.2 | (14⁺) | 2211.5 | (12⁺) | E2 | DCO=0.97 *9*. |
| 1258.2 *8* | 23.5 *20* | 6035.4 | (18⁻) | 4777.2 | (16⁻) | E2 | DCO=0.91 *9*. |
| 1261.4 *14* | 14.5 *20* | 7906.2 | (21⁺) | 6644.9 | (19⁺) | E2 | DCO=0.97 *9*. |
| 1286.8 *6* | 8.6 *12* | 5274.1 | (17⁺) | 3987.4 | (15⁺) | E2 | DCO=0.98 *9*. |
| 1287.6 *10* | 5.0 *10* | 5605.5 | (17⁻) | 4317.9 | (15⁻) | E2 | DCO=0.88 *11*. |
| 1303.4 *4* | 31.8 *18* | 3987.4 | (15⁺) | 2684.0 | (13⁺) | E2 | DCO=1.00 *7*. |
| 1303.4 *9* | 20.6 *20* | 6807.7 | (19⁻) | 5504.3 | (17⁻) | E2 | DCO=1.01 *9*. |
| 1320.3 *7* | 26.4 *20* | 5307.8 | (17⁺) | 3987.4 | (15⁺) | E2 | DCO=0.97 *9*. |
| 1320.8 *7* | 9 *3* | 2454.8 | (11⁻) | 1134.1 | (10⁺) | | |
| 1337.1 *5* | 20.5 *20* | 6644.9 | (19⁺) | 5307.8 | (17⁺) | E2 | DCO=1.00 *11*. |
| 1340.0 *9* | 15.8 *18* | 7819.3 | (21⁻) | 6479.3 | (19⁻) | E2 | DCO=1.04 *15*. |
| 1367.1 *10* | 5.9 *12* | 6972.6 | (19⁻) | 5605.5 | (17⁻) | | |
| 1370.9 *10* | 8 *3* | 6644.9 | (19⁺) | 5274.1 | (17⁺) | (E2) | DCO=1.03 *8* for 1373.0+1371.4+1370.9. |
| 1371.4 *10* | 18 *6* | 5274.1 | (17⁺) | 3902.4 | (15⁺) | (E2) | DCO=1.03 *8* for 1373.0+1371.4+1370.9. |
| 1373.0 *10* | 10 *4* | 4840.6 | (16⁺) | 3468.2 | (14⁺) | (E2) | DCO=1.03 *8* for 1373.0+1371.4+1370.9. |
| 1406.4 *9* | 20.3 *20* | 8214.1 | (21⁻) | 6807.7 | (19⁻) | E2 | DCO=0.98 *9*. |
| 1414 *2* | 4.7 *12* | 6722.1 | (19⁺) | 5307.8 | (17⁺) | | |
| 1424 *2* | 8 *3* | 6957.6 | (19⁺) | 5532.9 | (17⁺) | | |
| 1425.2 *9* | 21.9 *20* | 7460.7 | (20⁻) | 6035.4 | (18⁻) | E2 | DCO=1.06 *10*. |
| 1436.3 *8* | 6.4 *7* | 1710.7 | (9⁻) | 274.4 | (8⁺) | | |
| 1448.1 *10* | 10.9 *15* | 6722.1 | (19⁺) | 5274.1 | (17⁺) | | |
| 1456 *2* | 1.8 *5* | 8429 | (21⁻) | 6972.6 | (19⁻) | | |
| 1475.5 *14* | 10.0 *20* | 9381.7 | (23⁺) | 7906.2 | (21⁺) | E2 | DCO=0.98 *15*. |
| 1514.4 *10* | 15.6 *16* | 9728.6 | (23⁻) | 8214.1 | (21⁻) | E2 | DCO=1.11 *15*. |
| 1520.8 *15* | 6.3 *10* | 6361.5 | (18⁺) | 4840.6 | (16⁺) | | |
| 1548.0 *15* | 11.5 *18* | 8270.1 | (21⁺) | 6722.1 | (19⁺) | | |
| 1604.0 *15* | 5.6 *12* | 7965.5 | (20⁺) | 6361.5 | (18⁺) | | |
| 1604.1 *10* | 14.2 *15* | 9064.8 | (22⁻) | 7460.7 | (20⁻) | E2 | DCO=1.14 *12*. |

Continued on next page (footnotes at end of table)

**$^{58}$Ni($^{32}$S,3pn$\gamma$) 2000Wi10,1997Ta10,1999Co10 (continued)**

$\gamma$($^{86}$Nb) (continued)

| $E_\gamma$ † | $I_\gamma$ † | $E_i$(level) | $J^\pi_i$ | $E_f$ | $J^\pi_f$ | Mult.‡ | Comments |
|---|---|---|---|---|---|---|---|
| 1645 *3* | 6 *2* | 8603 | (21$^+$) | 6957.6 | (19$^+$) | | |
| 1649 *3* | 12 *3* | 6957.6 | (19$^+$) | 5307.8 | (17$^+$) | | |
| 1728.3 *11* | 11.2 *13* | 11456.9 | (25$^-$) | 9728.6 | (23$^-$) | E2 | DCO=0.99 *13*. |
| 1782.3 *17* | 5.7 *18* | 10052.5 | (23$^+$) | 8270.1 | (21$^+$) | | |
| 1801.7 *12* | 9.6 *12* | 10866.5 | (24$^-$) | 9064.8 | (22$^-$) | E2 | DCO=0.91 *10*. |
| 1808 *2* | 6.5 *20* | 9774 | (22$^+$) | 7965.5 | (20$^+$) | | |
| 1827 *3* | 4 *2* | 10430 | (23$^+$) | 8603 | (21$^+$) | | |
| 1830 *3* | 5.5 *10* | 9649 | (23$^-$) | 7819.3 | (21$^-$) | | |
| 1901 *2* | 6.0 *20* | 11283 | (25$^+$) | 9381.7 | (23$^+$) | | |
| 1959.6 *14* | 8.3 *13* | 13417 | (27$^-$) | 11456.9 | (25$^-$) | | |
| 1961 *3* | 3.7 *15* | 12013 | (25$^+$) | 10052.5 | (23$^+$) | | |
| 1978@ | | 12407? | (25$^+$) | 10430 | (23$^+$) | | |
| 2019 *3* | 2.8 *7* | 12886 | (26$^-$) | 10866.5 | (24$^-$) | | |
| 2209 *3* | <2 | 15095 | (28$^-$) | 12886 | (26$^-$) | | |
| 2226 *3* | 2.0 *8* | 13509 | (27$^+$) | 11283 | (25$^+$) | | |
| 2245 *3* | 4 *1* | 15662 | (29$^-$) | 13417 | (27$^-$) | | |
| 2285 *3* | 1.6 *7* | 13568 | (27$^+$) | 11283 | (25$^+$) | | |
| 2396 *3* | <2 | 18058 | (31$^-$) | 15662 | (29$^-$) | | |
| 2729@ | | 20786? | (33$^-$) | 18058 | (31$^-$) | | |

† From 1997Ta10.

‡ From $\gamma\gamma(\theta)$(DCO) data and $\gamma$(lin pol) data for selected transitions. For $\Delta$J=2 stretched transitions, mult=E2 is from RUL.

\# 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.

@ Placement of transition in the level scheme is uncertain.

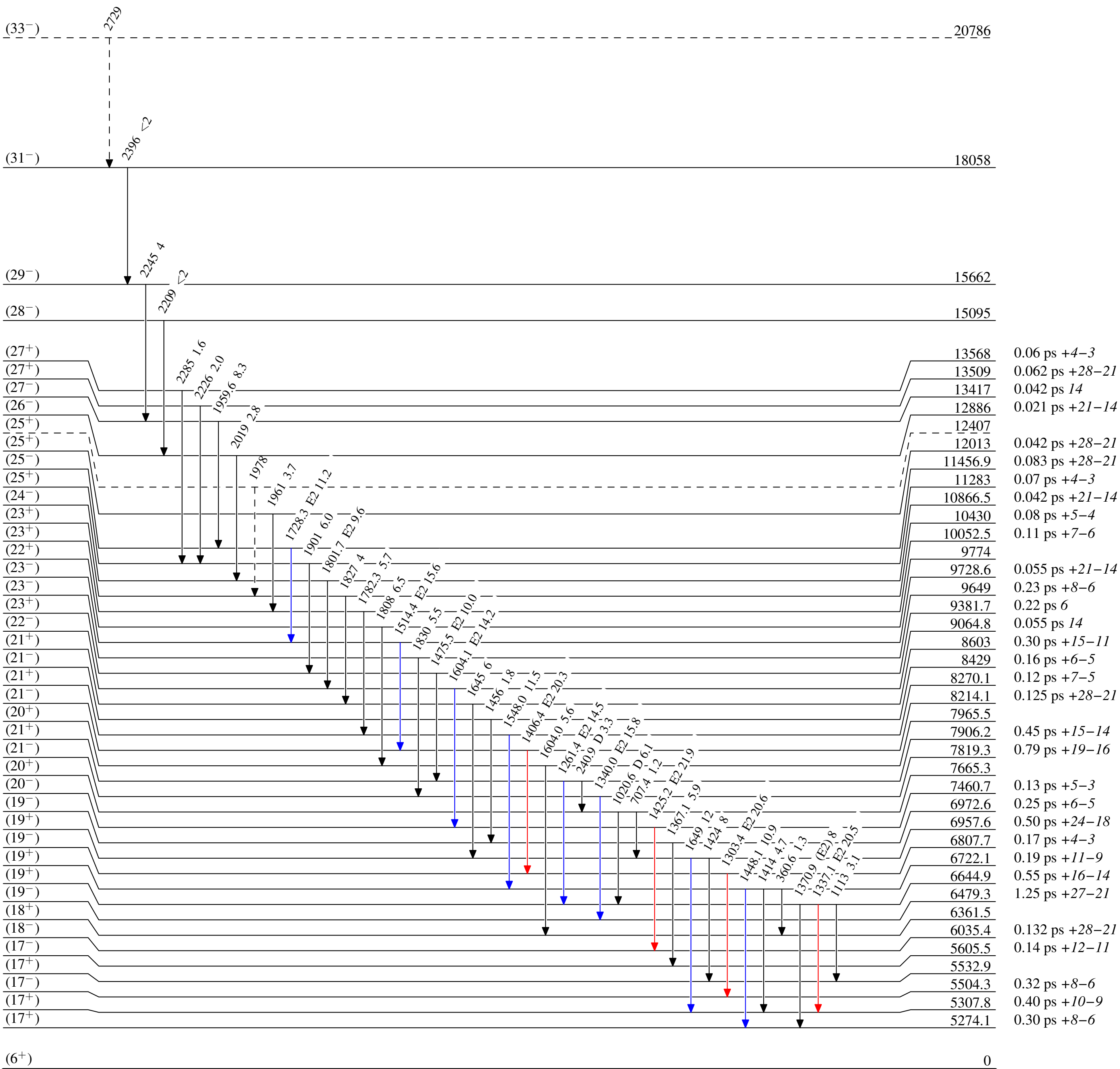
## $^{58}Ni(^{32}S,3pn\gamma)$ 2000Wi10,1997Ta10,1999Co10

### Level Scheme

Intensities: Relative $I_\gamma$

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
$\gamma$ Decay (Uncertain)

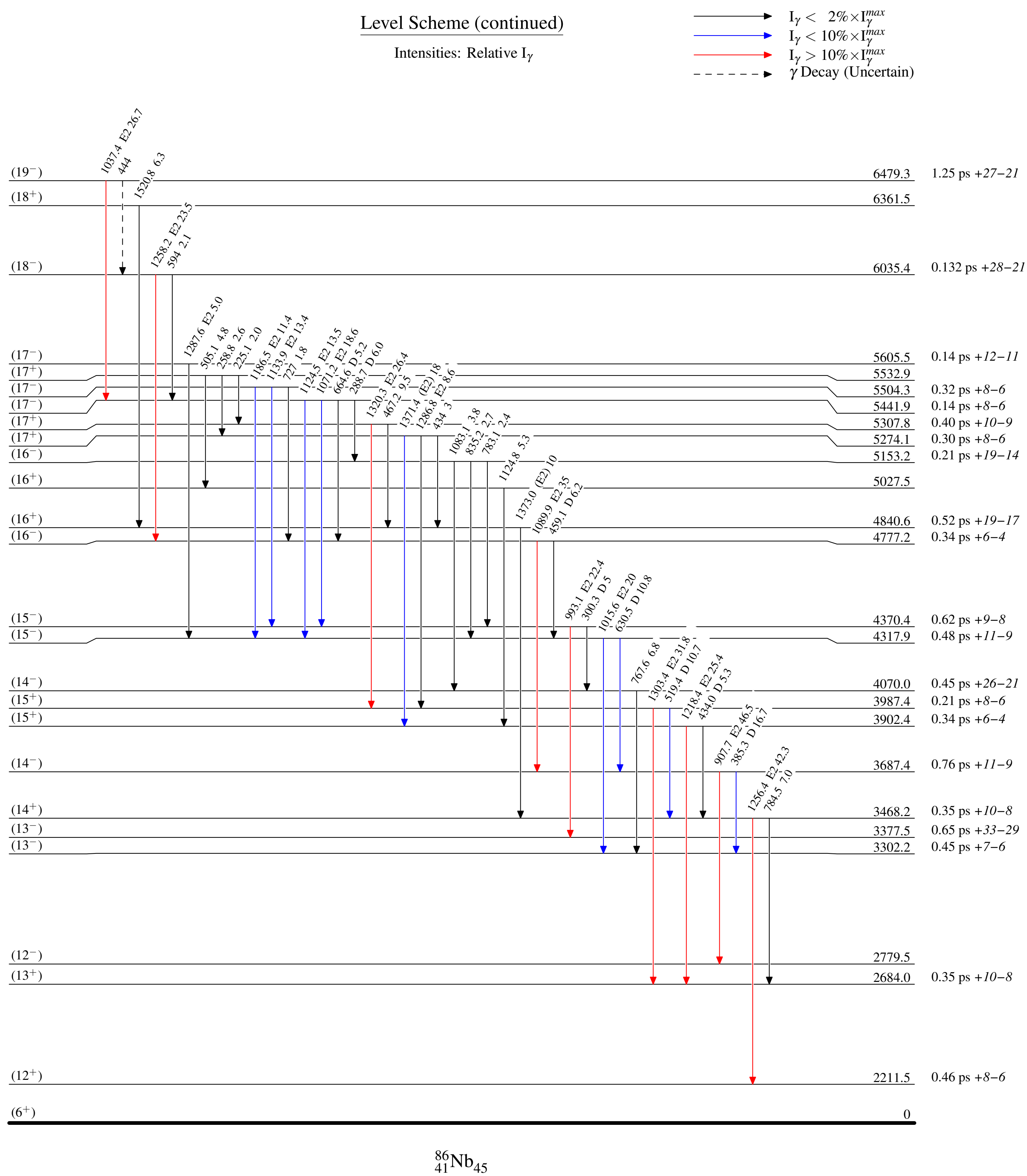



$^{86}_{41}Nb_{45}$

**$^{58}$Ni($^{32}$S,3pnγ) 2000Wi10,1997Ta10,1999Co10**

Level Scheme (continued)

Intensities: Relative $I_\gamma$



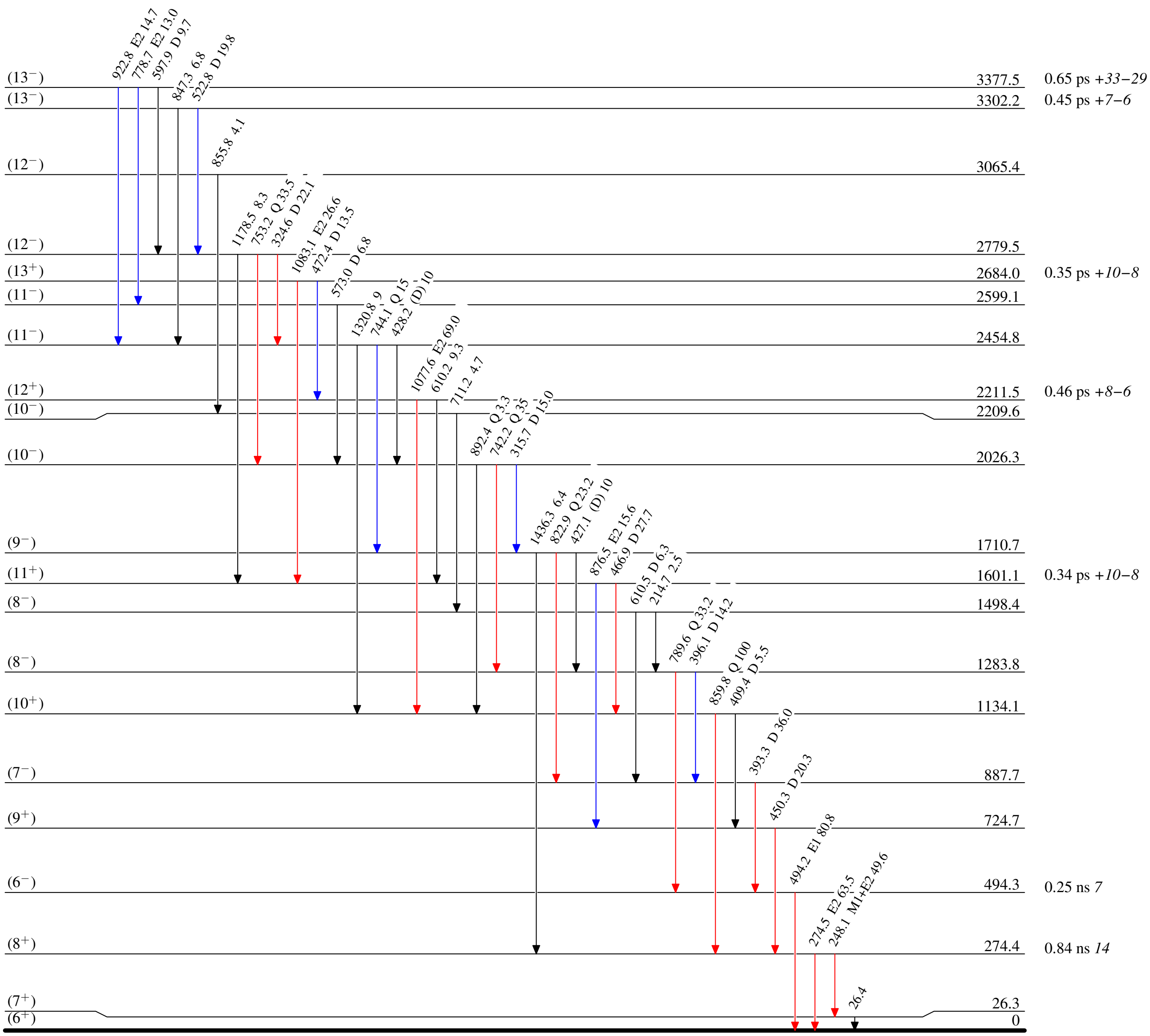
**$^{58}Ni(^{32}S,3pn\gamma)$ 2000Wi10,1997Ta10,1999Co10**

Level Scheme (continued)

Intensities: Relative $I_\gamma$

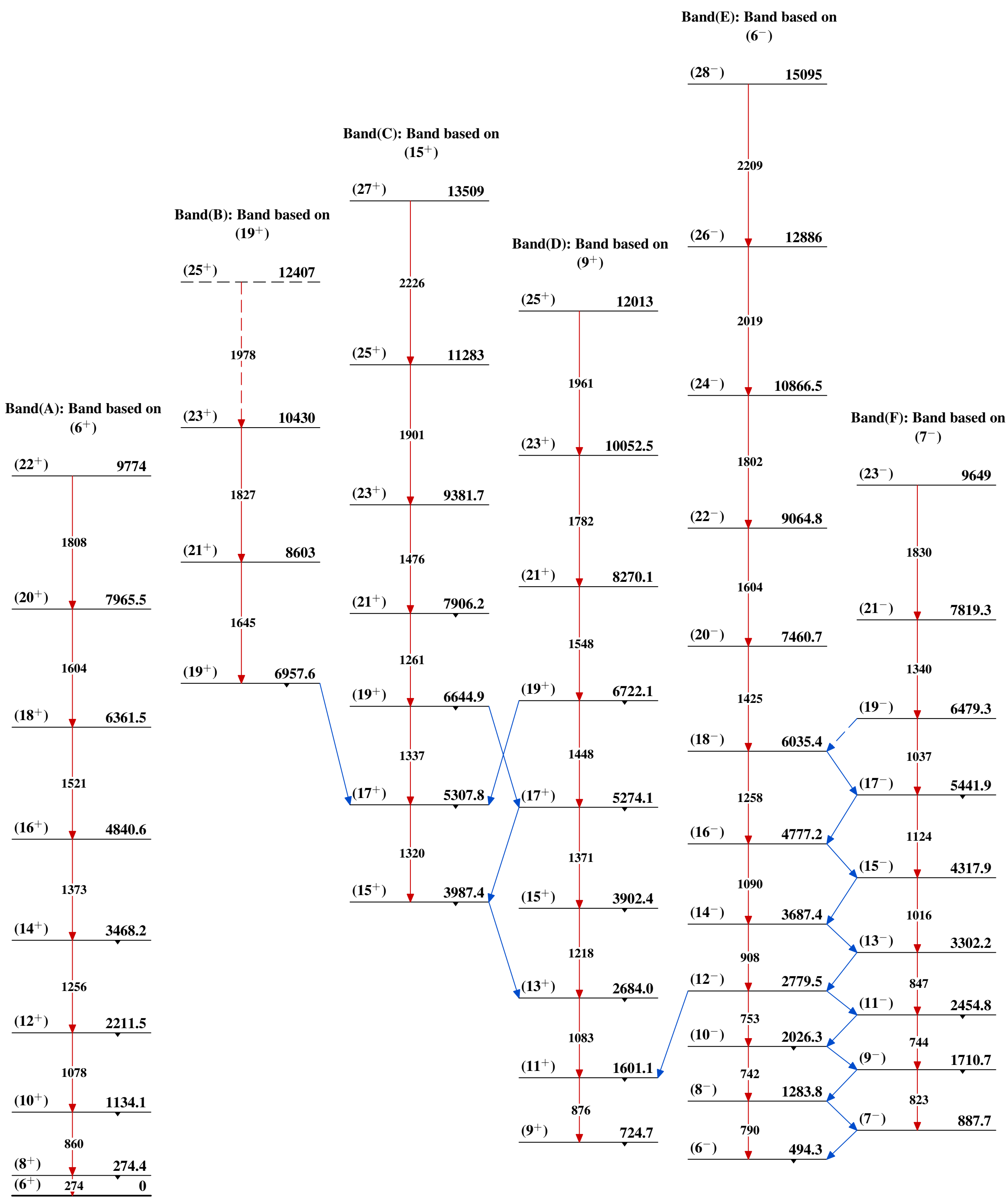
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



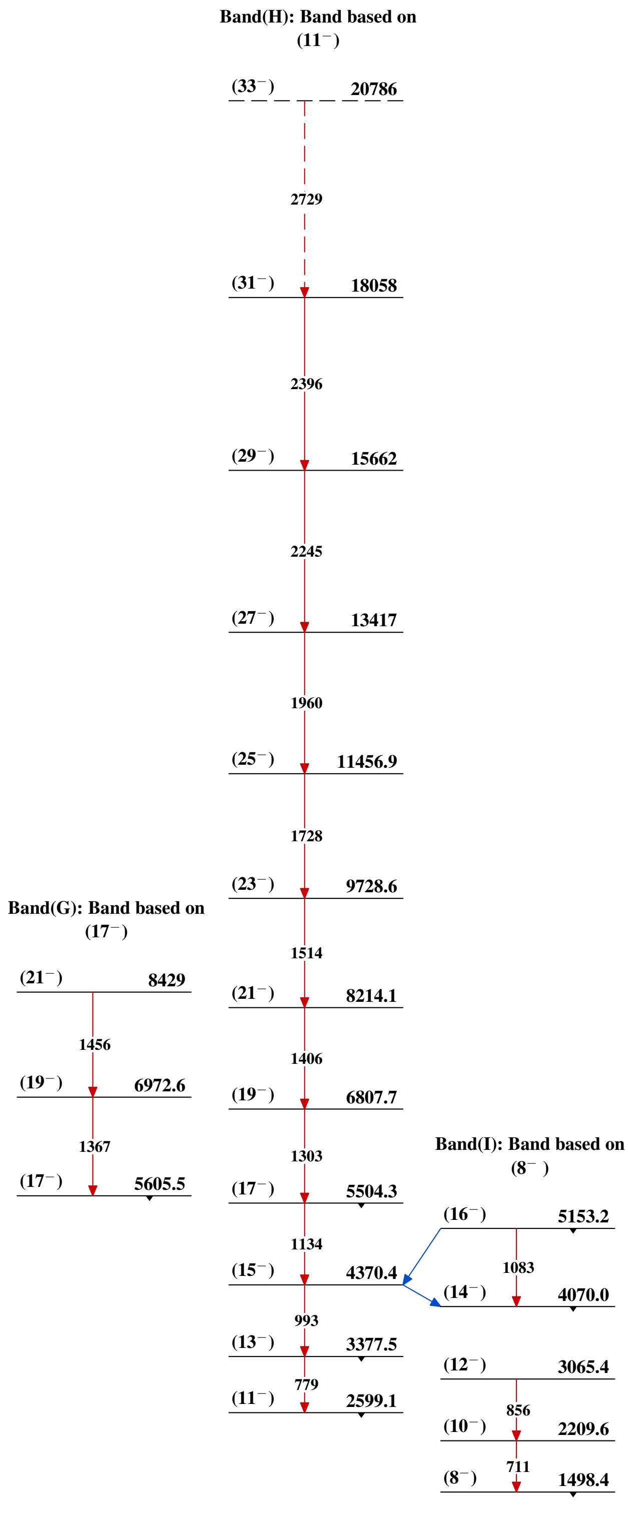

$^{86}_{41}Nb_{45}$

## $^{58}Ni(^{32}S,3pn\gamma)$ 2000Wi10,1997Ta10,1999Co10




$^{86}_{41}Nb_{45}$

## $^{58}Ni(^{32}S,3pn\gamma)$ 2000Wi10,1997Ta10,1999Co10 (continued)




$^{86}_{41}Nb_{45}$