## $^{93}$Nb(p,d) 1984Ru09,1968Ta03

| Type | Author | History Citation | Literature Cutoff Date |
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$J^\pi(^{93}Nb)=9/2^+$.
Other: 1964Sw01.
1964Sw01: E(p)=22 MeV, FWHM=30 keV.
1968Ta03: E(p)=55 MeV, FWHM≈100 keV, $\theta$(c.m.)≈7°−37°; DWBA.
1984Ru09: E(p)=26.3 MeV, FWHM=25-30 keV, $\theta$(lab)=6°−55°; DWBA.

### $^{92}$Nb Levels

| E(level)‡ | L† | C$^2$S# | E(level)‡ | Jπ | L† | C$^2$S# |
|---|---|---|---|---|---|---|
| 0.0 | 2 | 0.36 | 2803 *12* | | 1 | 0.14, 0.17 |
| 135 *12* | 2 | 0.20 | 2946 *12* | | 4 | 1.60 |
| 286 *12* | 2 | 0.13 | 3015 *12* | | 4 | 0.24 |
| 357 *12* | 2 | 0.10 | 3047 *12* | | 4 | 0.34 |
| 478 *12* | 2[a] | 0.18[a] | 3110 *12* | | 1 | 0.029,0.037 |
| 502 *12* | | | 3196 *12* | | 1 | 0.015,0.017 |
| 1402 *12* | 0 | 0.015 | 3251 *12* | | 1 | 0.043,0.048 |
| 1557 *12* | 2 | 0.003 | 3310 *12* | | 1 | 0.039,0.048 |
| 1605 *12* | 0 | 0.012 | 3342 *12* | | 1 | 0.069,0.086 |
| 1638 *12* | 0 | 0.006 | 3404 *12* | | 1 | 0.038,0.049 |
| 1713 *12* | (1) | 0.002,0.002 | 3447 *12* | | 1 | 0.038,0.043 |
| 1761 *12* | 2 | 0.008 | 3489 *12* | | (4)[b] | 0.54 |
| 1828 *12* | 0 | 0.006 | 3517 *12* | | 1 | 0.065,0.071 |
| 2072 *12* | | | 3615 *12* | | | |
| 2142 *12* | | | 3665 *12* | | 1 | 0.086,0.10 |
| 2238 *12* | 1 | 0.008,0.009 | 3716 *12* | | 1 | 0.034,0.038 |
| 2292 *12* | (2+4) | @ | 3806 *12* | | 1 | 0.043,0.052 |
| 2390 *12* | 1 | 0.012,0.015 | 4079 *12* | | 1 | 0.077,0.095 |
| 2503 *12* | (1)[b] | 0.006,0.007 | 4135 *12* | | 4 | 0.37 |
| 2592 *12* | | | 11.54×10$^3$& *30* | 5$^-$[c] | 1[c] | |
| 2666 *12* | 1 | 0.012,0.014 | 11.80×10$^3$& *30* | (4)$^-$[c] | 1[c] | |
| 2737 *12* | 4 | 0.43 | | | | |

† For E≤10 MeV: from 1984Ru09, based on DWBA analysis of $\sigma(\theta)$. For E>10 MeV: from 1968Ta03, based on comparison of $\sigma(\theta)$ with that for $^{90}$Zr(p,d) L=1 transfer to IAS at 8110 keV in $^{89}$Zr.
‡ From 1984Ru09, unless noted otherwise. Authors report an uncertainty of 8 to 12 keV.
# C$^2$S values are from DWBA analysis by 1984Ru09 which assumes $3s_{1/2}$, $2d_{5/2}$, $1g_{9/2}$ and either $2p_{3/2}$ or $2p_{1/2}$ for L=0,2,4,1 transfers, respectively, and includes finite range corrections and bound state geometry different from that of relevant (d,t) analysis (1971Bh01), resulting in C$^2$S values approximately half of those reported by 1971Bh01. For L=1 transfers, $2p_{3/2}$ values are listed first, then $2p_{1/2}$.
@ 1984Ru09 obtain C$^2$S(L=2)=0.014, C$^2$S(L=4)=0.055 from least-squares adjustment of the incoherent sum of DWBA results for $2d_{5/2}$ and $1g_{9/2}$ transitions.
& From 1968Ta03. Authors interpret 11540 and 12800 levels as analogs of the 5$^-$ $^{92}$Zr(2486 level) and the (4)$^-$ $^{92}$Zr(2744) level, respectively. Observed splitting of the two analog states is 260 keV *40* (1968Ta03).
[a] L=2, C$^2$S=0.18 for 478+502 doublet.
[b] An additional undetermined L transfer contributes.
[c] L is based on comparison of $\sigma$ and $\sigma(\theta)$ with those for known configuration=$(\nu\ 2p_{1/2})^{-1}$, $J^\pi=1/2^-$ $^{89}$Zr(8110 level). J is based on $(2J_f+1)$ intensity rule, assuming configuration=$((\nu\ 2p_{1/2})^{-1}(\pi\ 1g_{9/2}))$ for these $^{92}$Nb states.