## $^{108}\text{Nb}\,\beta^-$ decay    **1996Pe25**

### History

| | Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|---|
| | Full Evaluation | Jean Blachot | ENSDF | 1-Jul-2008 |

Parent: $^{108}\text{Nb}$: E=0.0; $J^\pi$=(2$^+$); $T_{1/2}$=0.193 s *17*; Q($\beta^-$)=10607 *SY*; %$\beta^-$ decay=100.0

Identified from $^{238}\text{U}$(p,f), E=20 MeV, on-line isotope separator IGISOL.

Measured: $\gamma$, $\gamma\gamma$, $\beta\gamma$. 30% ultrapure Ge, Plastic Scintillator.

The identification of $^{108}\text{Nb}$ is based on the observation of the known $\gamma$ in $^{108}\text{Mo}$ in coin with $\beta$ particles.

### $^{108}\text{Mo}$ Levels

| E(level) | $J^\pi$ | $T_{1/2}$ |
|---|---|---|
| 0.0 | 0$^+$ | 1.09 s *2* |
| 192.9 | 2$^+$ | 0.5 ns *3* |
| 563.8 | 4$^+$ | |
| 586.09 *16* | 2$^+$ | |
| 783.07 *18* | 3$^+$ | |

### $\beta^-$ radiations

| E(decay) | E(level) | I$\beta^{-\dagger}$ | Log *ft* | Comments |
|---|---|---|---|---|
| (9823 *SY*) | 783.07 | 53 | 5.0 | av E$\beta$=4379.06 *9* |
| (10020 *SY*) | 586.09 | 25 | 5.4 | av E$\beta$=4473.09 *8* |
| (10043 *SY*) | 563.8 | <9 | >5.8 | av E$\beta$=4484 |
| | | | | I$\beta^-$: no feeding would be expected to a 4$^+$ state from a 2$^+$ parent. |
| (10414 *SY*) | 192.9 | 13 | 5.7 | av E$\beta$=4661 |

$^\dagger$ Absolute intensity per 100 decays.

### $\gamma(^{108}\text{Mo})$

I$\gamma$ normalization: based on the assumption that the $J^\pi$ for $^{108}\text{Nb}$ is (2$^+$), and so no beta feeding is expected to the g.s.

| E$_\gamma{}^\dagger$ | I$_\gamma{}^\ddagger$ | E$_i$(level) | $J_i^\pi$ | E$_f$ | $J_f^\pi$ | Mult. | $\alpha^\#$ | Comments |
|---|---|---|---|---|---|---|---|---|
| 192.7 *2* | 100 | 192.9 | 2$^+$ | 0.0 | 0$^+$ | [E2] | 0.115 | $\alpha$(K)=0.097; $\alpha$(L)=0.0138; $\alpha$(N+..)=0.00043 |
| | | | | | | | | B(E2)(W.u.)=1.3×10$^2$ *8* |
| 196.9 *2* | 10 | 783.07 | 3$^+$ | 586.09 | 2$^+$ | [M1] | 0.0406 | $\alpha$(K)=0.0352; $\alpha$(L)=0.00409; $\alpha$(N+..)=0.00013 |
| 219.4 *2* | 5 | 783.07 | 3$^+$ | 563.8 | 4$^+$ | | | |
| 370.9 *2* | 16 | 563.8 | 4$^+$ | 192.9 | 2$^+$ | | | I$_\gamma$: because of spectrum complexity, this represents an upper limit. |
| 393.2 *2* | 25 | 586.09 | 2$^+$ | 192.9 | 2$^+$ | | | |
| 586.0 *2* | 17 | 586.09 | 2$^+$ | 0.0 | 0$^+$ | | | |
| 590.1 *2* | 53 | 783.07 | 3$^+$ | 192.9 | 2$^+$ | | | |

$^\dagger$ No uncertainties are given in 1996Pe25. Values are identical to those of 1996Gu04 in SF decay (except E$\gamma$=586.1 there) where $\Delta$E$\gamma$=0.2 keV.

$^\ddagger$ For absolute intensity per 100 decays, multiply by 0.78.

$^\#$ 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.

$^{108}$**Nb** $\beta^-$ **decay**      **1996Pe25**

Decay Scheme

Intensities: I$_\gamma$ per 100 parent decays

Legend

I$_\gamma <$  2%$\times$I$_\gamma^{max}$
I$_\gamma <$ 10%$\times$I$_\gamma^{max}$
I$_\gamma >$ 10%$\times$I$_\gamma^{max}$

(2$^+$)        0.0      0.193 s *17*

Q$_{\beta-}$=10607 *SY*     %$\beta^-$=100

$^{108}_{41}$Nb$_{67}$

| I$\beta^-$ | Log $ft$ | | | |
|---|---|---|---|---|
| 53 | 5.0 | 3$^+$ | | 783.07 |
| 25 | 5.4 | 2$^+$ | | 586.09 |
| <9 | >5.8 | 4$^+$ | | 563.8 |
| 13 | 5.7 | 2$^+$ | | 192.9    0.5 ns *3* |
| | | 0$^+$ | | 0.0    1.09 s *2* |

590.1 41
219.4 3.9
196.9 [M1] 7.8
586.0 13.3
393.2 19.5
370.9 12.5
192.7 [E2] 78

$^{108}_{42}$Mo$_{66}$