$^{103}\text{Y}\ \beta^-$ **decay**　　　**1996Lh04**

| | | History | |
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Parent: ^{103}Y: E=0; J^π=(5/2$^+$); T$_{1/2}$=0.23 s 2; Q(β^-)=9440 SY; %β^- decay=100.0

Source produced by U(p,F). Mass-separated source. Measured $\gamma\gamma$(t), $\beta\gamma$(t).

^{103}Zr Levels

β: %βn=8 3 and T$_{1/2\ 1/2}$=0.23 s. The log ft's were calculated using Q(β^-)=9.44 MeV are uncertain since I(258.9γ)=20-6.

E(level)	$J^{\pi\dagger}$	T$_{1/2}$	Comments
0	(5/2$^-$)	1.3 s 1	Suggested Nilsson configuration: 5/2[532].
109.1 3	(7/2$^-$)	<3 ns	T$_{1/2}$: from $\beta\gamma\gamma$(t) using 109.1γ.
258.9	(3/2$^+$)		Authors propose a log ft=4.9 from an estimated Iβ=71.
			Suggested Nilsson configuration: 3/2[411].
357.1 4	(5/2$^+$)	<3 ns	T$_{1/2}$: from $\beta\gamma\gamma$(t) using 98.2γ.
			Authors propose a log ft=5.4 from an estimated Iβ=21.

† From Adopted Levels.

$\gamma(^{103}\text{Zr})$

Iγ normalization: no direct β^- g.s. assumed. It is assumed that the estimated yield of 12% for ^{103}Y corresponds to the measured rate for the 98.2 keV γ. Large decay energy and feeding from (5/2$^+$) parent indicate significant unobserved g.s. feeding from high-lying levels.

E$_\gamma$	I$_\gamma^\ddagger$	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.†	$\alpha^\#$	Comments
98.2 3	12 2	357.1	(5/2$^+$)	258.9	(3/2$^+$)	(M1,E2)	0.7 5	
109.1 3	8 2	109.1	(7/2$^-$)	0	(5/2$^-$)	(M1,E2)	0.5 4	
248$^@$	8	357.1	(5/2$^+$)	109.1	(7/2$^-$)			Iγ estimated from intensity balance of 109 keV level assuming no direct β feeding of 109 keV level. Observation hindered by the presence of a 247.6 keV γ in ^{103}Nb.
258.9 3		258.9	(3/2$^+$)	0	(5/2$^-$)			Transition obscured by impurity. Iγ=20-60 estimated by the authors.
357$^@$		357.1	(5/2$^+$)	0	(5/2$^-$)			γ expected from systematics but masked by the presence of a 357.7 keV γ transition in ^{103}Nb.

† Tentatively deduced from level scheme based on level systematics.

‡ Absolute intensity per 100 decays.

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

$^@$ Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: Relative I_γ

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)

$(5/2^+)$ 0   0.23 s 2

$Q_{\beta^-} = 9440\ SY$ $\%\beta^- = 100.0$

$^{103}_{39}\text{Y}_{64}$

357   248 8   98.2 (M1,E2) 12

258.9

109.1 (M1,E2) 8

$(5/2^+)$ 357.1   <3 ns

$(3/2^+)$ 258.9

$(7/2^-)$ 109.1   <3 ns

$(5/2^-)$ 0   1.3 s 1

$^{103}_{40}\text{Zr}_{63}$