^{40}Si β^- n decay:27.6 ms   2017Tr02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

Parent: ^{40}Si: E=0; J^π=0$^+$; T$_{1/2}$=27.6 ms *14*; Q(β^-n)=1013×10^1 *36*; %β^-n decay=38 *5*

^{40}Si-T$_{1/2}$: Measured by 2017Tr02, from decay curve of β-implant correlations, in coincidence with strong γ rays. It is 33.0 ms *10* (from 2004Gr20) in Adopted Levels of ^{40}Si in 2015 evaluation.

^{40}Si-Q(β^-n): 10130 *360* (2017Wa10: AME-2016).

^{40}Si-%β^-n decay: %β^-n=38 *5* for ^{40}Si decay determined by 2017Tr02, out of which 20% feeding was observed by the authors to feed the 355 and 973 levels. A large fraction of %β^-n probably feeds the ground state of ^{39}P.

2017Tr02: ^{40}Si produced in ^{9}Be(^{48}Ca,X), E=140 MeV/nucleon reaction, and separated using A1900 fragment separator at NSCL-MSU facility. The fragments were detected by a 16×16 segmented planar Ge double-sided strip detector (GeDSSD) for timing and position of the implanted ions, and subsequent decays. Measured Eγ, Iγ, $\gamma\gamma$-coin using SeGA array of 16 segmented Ge detectors. Deduced %β^-n. Comparison with shell-model calculations.

All data are from 2017Tr02. Level scheme and J^π assignments are based on the work of 2004So30 in ^{9}Be(^{48}Ca,Xγ).

^{39}P Levels

E(level)[†]	J^π
0	(1/2$^+$)
355 *1*	(3/2$^+$)
973 *1*	(5/2$^+$)

[†] From Eγ.

$\gamma(^{39}$P)

E$_\gamma$[†]	E$_i$(level)	J^π_i	E$_f$	J^π_f
355 *1*	355	(3/2$^+$)	0	(1/2$^+$)
973 *1*	973	(5/2$^+$)	0	(1/2$^+$)

[†] Uncertainty of 1 keV in Eγ value assumed based on similar assignment for other γ rays in 2017Tr02.

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Decay Scheme

0$^+$ _____ 0   27.6 ms *14*

%β^-n=38   Q=1013×10^1 *36*

$^{40}_{14}$Si$_{26}$

(5/2$^+$) *973* _____ 973

(3/2$^+$) *355* _____ 355

(1/2$^+$) _____ 0

$^{39}_{15}$P$_{24}$