^{9}Be(^{40}Si,^{39}Siγ)   2014St18

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

One-neutron knockout reaction.

2014St18: E=79 *1* MeV/nucleon ^{40}Si secondary beam was produced in fragmentation of 140 MeV/nucleon ^{48}Ca primary beam with a ^{9}Be production target, followed by purification in A1900 fragment separator at NSCL-MSU facility. Secondary ^{9}Be target was 376 mg/cm^2 thick. Reaction residues were identified by an ionization chamber in the focal plane of S800 spectrograph; time-of-flight was measured by a plastic scintillator. Measured Eγ, Iγ, $\gamma\gamma$-coin, (^{39}Si)γ-coin using GRETINA array of Ge detectors. Deduced levels, J, π, L-transfer from parallel momentum distributions. Comparison with large-scale shell model calculations. See also 2015St06.

2015St06: from the same group as 2014St18; neutron knockout cross sections analyzed for excited states. For experimental details, see 2014St18.

All data are from 2014St18, unless otherwise noted.

^{39}Si Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	L[#]	Comments
0	(5/2$^-$)			Total knockout σ=116 mb *5* (2015St06).
0+x	(3/2$^-$)			Partial knockout σ=29 mb *20* (2014St18,2015St06).
172 *5*	(7/2$^-$)	0.97 ns *7*	2,3	T$_{1/2}$: from maximum likelihood fit to the decaying 172-keV γ ray (2015St06), uncertainty is statistical only. Other: 0.90 ns *14* from broadened lineshape (2014St18). Partial knockout σ=49 mb *7* (2014St18,2015St06).
879? *4*	(3/2$^+$)		2,3	E(level): tentatively proposed by 2014St18 based on comparison with shell-model predictions. Partial knockout σ=14 mb *2* (2015St06).

[†] From Eγ data.
[‡] From shell-model predictions.
[#] From parallel momentum distribution (2014St18) and Eikonal model analysis.

γ(^{39}Si)

Eγ	Iγ	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	Comments
172 *5*	39 *2*	172	(7/2$^-$)	0	(5/2$^-$)	[M1]	Iγ: 39 +2−1 (2015St06).
[x]290 *3*	4 *1*						
[x]350 *3*	6 *2*						
[x]379 *3*	10 *2*						Momentum distribution in coin with 379γ suggests L=(0,1).
[x]485 *4*	3 *1*						
[x]644 *4*	3 *1*						
879[†] *4*	12 *2*	879?	(3/2$^+$)	0	(5/2$^-$)		
[x]928 *4*	5.4 *11*						Momentum distribution in coin with 928γ suggests L=(0 to 4).
[x]974 *4*	2.5 *9*						

[†] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Legend

Level Scheme

Intensities: Yield/100 ions

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

$(3/2^+)$ _____ 879

$(7/2^-)$ _____ 172   0.97 ns 7
$(5/2^-)$ _____ 0

$^{39}_{14}$Si$_{25}$