^{9}Be(^{26}Si,^{24}Siγ)   2006Yo05,2020Lo05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty	NDS 186, 2 (2022)	31-Mar-2022

Other: 2006Ob03.

2006Yo05: ^{9}Be(^{26}Si,^{24}Siγ) two-neutron knockout reaction.

^{26}Si beam produced from fragmentation of ^{36}Ar primary beam at 150 MeV/nucleon with a Be target. E(^{26}Si)=109 MeV/nucleon. Measured Eγ, $\gamma\gamma$, σ using S800 spectrometer, angle information obtained from CRDC detectors in the S800 focal plane. γ rays detected with SeGA, an array of 17 *32*-fold segmented high-purity Ge detectors. Shell-model calculations. Same research group of 2006Ob03, reports excited states at 1860 *10* and 3410 *16* same as 2006Yo05.

2020Lo05: Secondary ^{26}Si beam, E=109 MeV/nucleon (mid-target), was produced from fragmentation 150 MeV/nucleon ^{36}Ar primary beam from the NSCL cyclotron on a 550 mg/cm^2 ^{9}Be target. The secondary target was 287 *3* mg/cm^2 ^{9}Be. Fragments were separated by the A1900 fragment separator. γ rays were detected with the CAESAR array consisting of 192 high-efficiency cesium-iodide scintillator. Reaction residues are identified by magnetic rigidity of the S800 spectrograph and particle trajectory. Measured Eγ, σ(Eγ), momentum distributions. Deduced levels, J, π. Comparisons with theoretical calculations. Same research group of 2006Yo05 and 2006Ob03.

^{24}Si Levels

Inclusive cross section σ=0.92 mb *10*. An expected 4$^+$ state at 3471, reported in the literature, was not populated in the 2-neutron knock-out reaction, suggests to be the (0$^+_2$) state based on the theoretical considerations of the Thomas-Ehrman shift. It is one of the largest experimental mirror-energy shifts ever observed, 2020Lo05 note.

E(level)[†]	J$^{\pi}$[‡]	Comments
0	0$^+$	σ=0.71 mb *9* (2006Yo05), 0.62 mb *8* (2020Lo05).
1867 *6*	2$^+$	σ=0.15 mb *4* (2006Yo05), 0.17 mb *3* (2020Lo05).
3431 *10*	2$^+$	J$^{\pi}$: (2,4)$^+$ in 2006Yo05, from shell model calculations and comparison with states of mirror ^{24}Ne nuclide. σ=0.14 mb *4* (2006Yo05), 0.13 mb *3* (2020Lo05).

[†] From Eγ.
[‡] Proposed in 2020Lo05, based on parallel momentum distribution measurements and analysis.

γ(^{24}Si)

E$_\gamma$	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Comments
1564 *8*	3431	2$^+$	1867	2$^+$	E$_\gamma$: Weighted average of 1550 *12* (2006Yo05) and 1569 *7* (2020Lo05).
1867 *6*	1867	2$^+$	0	0$^+$	E$_\gamma$: Weighted average of 1860 *10* (2006Yo05) and 1870 *6* (2020Lo05). Uncertainty is the lower input value.

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Level Scheme

$^{24}_{14}Si_{10}$

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