^{29}Si(d,p) 1960Br17,1961Zh01,1963Gu02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

$J^\pi(^{29}Si)=1/2^+$.

Others: 1968Ca32, 1973Ma06, 1975Ts01 (^{16}O,^{15}O), 1987Da16 (pol d,p), 1990Pi05.

1960Br17: Enriched target of ^{29}Si, E_d not given; measured proton spectra at 30°. Deduced excited levels. FWHM=700 keV.

1961Zh01: 63.7% enriched ^{29}Si target, E_d=6.58 MeV; multi-angle magnetic analyzer, measured E(p)(θ); identified excited levels, deduced L, spin, parity.

1963Gu02: Enriched (70%) ^{29}Si target (thickness=200 μg/cm^2); E_d=5-15 MeV; multi-angle magnetic multi-spectrograph analyzer; measured $\sigma_{rel}(\theta)$ from 10° to 90°; deduced levels, L, spin, parity.

1973Ba50: 80% and 92% enriched in ^{29}Si of SiO_2 target; E_d=10 MeV; Magnetic spectrograph; protons were detected with semiconductor counter telescopes at lab angles of 27.5°, 35.0°, and 42.5°, measured $\sigma(\theta)$, deduced level energies, L values. In 1973Ba50, the ^{28}Si(t,p) reaction was also used to study the ^{30}Si levels.

^{30}Si Levels

$C^2\theta^2$ [J]: listed in the comments from 1963Gu02, defined as the relative reduced widths (C^2 is the coefficient of addition of isotopic spins, introduced in ref. [12] and [J] is the statistical factor).

E(level)[†]	J^π[&]	L[&]	S[c]	Comments
0[‡]	0^+	0	0.99 *30*	$C^2\theta^2$ [J] (rel)=1; 0.97 (1975Ts01 – (^{16}O,^{15}O)).
2235[#]	2^+	2[a]	0.75 *23*	J^π: dσ/dω, DWBA analysis, and vector analyzing power.
3498[#]	2^+	2[a]	0.14 *4*	E(level): other: 3507 *10* (1973Ma06). J^π: dσ/dω, DWBA analysis, and vector analyzing power.
3769[#]	1^+	2[a]	0.67 *20*	E(level): doublet in 1987Da16.
3788[#]	0^+	0	0.44 *13*	E(level): doublet in 1987Da16. 3.79 × 10^3 in 1963Gu02. $C^2\theta^2$ [J] (rel)=1.7 *6* (1963Gu02).
4810[#]	2^+	2[b]		E(level): doublet in 1987Da16.
4831[#]	3^+	2[b]		E(level): doublet in 1987Da16.
5232[@]		2[b]		
5488		3[a]	0.31 *9*	E(level): 5.48 × 10^3 in 1960Br17. Other: 5490 *10* (1973Ma06). S: for $J^\pi=3^-$.
5614		2[a]	0.07 *2*	E(level): 5.61 × 10^3 in 1960Br17. Other: 5621 *10* (1973Ma06). S: for $J^\pi=2^+$.
6500		3[a]	0.94 *28*	E(level): others: 6494 (1960Br17), 6510 *10* (1973Ma06). S: for $J^\pi=2^-$ and 0.38 *11* for 4^-.
6636		1[b]		E(level): others: 6630 (1960Br17), 6634 *10* (1973Ma06). Also reported in 1961Zh01.
6740		1[a]	0.29 *9*	E(level): others: 6734 (1960Br17), 6748 *10* (1973Ma06). Also reported in 1961Zh01. S: for $J^\pi=1^-$.
7503		1[a]	0.32 *10*	E(level): others: 7497 (1960Br17), 7510 *10* (1973Ma06). S: for $J^\pi=2^-$, (1.72 *52*) for (0^-), and 0.53 *16* for 1^-.
7619?				E(level): other: 7613 (1960Br17).
7637[b] *10*		0,2[b]		
7664		2[a]	0.14 *4*	E(level): other: 7658 (1960Br17), 7673 *10* (1973Ma06). S: for $J^\pi=1^+$, 0.08 *2* for 2^+, and 0.05 *2* for 3^+.
7925[b] *10*		2[b]		
8099				E(level): others: 8093 (1960Br17), (8.09+8.149) × 10^3 in 1963Gu02 as doublet. 8107 *10* (1973Ma06).
8155	0^-,1^-,2^-	1		E(level): others: 8149 (1960Br17). 8166 *10* (1973Ma06). Also reported in 1961Zh01. (3.79+8.149) × 10^3 in 1963Gu02 as doublet.

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^{29}Si(d,p) 1960Br17,1961Zh01,1963Gu02 (continued)

^{30}Si Levels (continued)

E(level)[†]	L[&]	Comments
		J^π: proposed in 1961Zh01, probably from shell model calculations.
		J^π,L: for doublet in 1963Gu02.
		$C^2\theta^2$ [J] (rel)=5.0 *15* for doublet (1963Gu02).
8461 *10*		E(level): from 1973Ma06.
8577	1,0	E(level): 8571 (1960Br17). Also reported in 1961Zh01.
		L: From 1961Zh01, based on measured $\sigma(\theta)$ and calculations.
8597 *10*	3	
8650 *10*		E(level): from 1973Ma06.
8796	(1)[b]	E(level): 8790 (1960Br17), 8801 *10* (1973Ma06).
8899[b] *10*	1[b]	
8953?	(1)[b]	E(level): 8947 (1960Br17), 8947 *10* (1973Ma06).
9047 *10*		E(level): from 1973Ma06.
9104	1[b]	E(level): 9098 (1960Br17), 9110 *10* (1973Ma06).
9252		E(level): 9246 (1960Br17), 9256 *10* (1973Ma06).
9314[b] *10*	(1)[b]	
9450[b] *10*	1[b]	
9596		E(level): 9590 (1960Br17), 9585 *10* (1973Ma06).
10766		E(level): 10760 (1960Br17).

[†] Based on 1960Br17, except where otherwise noted. The reported excitation energies in 1960Br17 with respect to $E_\alpha(^{210}Po)$=5298 keV) are listed in comments. Current value of $E_\alpha(^{210}Po)$=5304.33 keV (2008Ko21)) is used to obtain the excitation energy. Excitation energies with respect to the Q(^{29}Si(d,p)^{30}Si)=8385 keV remains the same. Uncertainty stated to be that of Q, which was 5 keV in 1960Br17, at present that is less than 1 keV − not listed.

[‡] From the Adopted Levels (rounded value), reported in 1963Gu02.

[#] From the Adopted Levels (rounded value), reported in 1987Da16.

[@] From the Adopted Levels (rounded value), reported in 1973Ma06.

[&] From 1963Gu02, except where otherwise noted, based on $\sigma_{rel}(\theta)$ and comparison with calculations (Butler′s formula), except where otherwise noted.

[a] From 1973Ba50, based on measured $\sigma(\theta)$ and DWBA analysis.

[b] From 1973Ma06.

[c] From 1973Ba50. Spectroscopic factors have 20% relative uncertainty and 30% absolute uncertainty. The evaluators list 30% uncertainty.