

$^{30}\text{Si}(\text{pol d},\alpha),(\text{d},\alpha),(\text{d},\alpha\gamma)$ 1978Ik01,1976Bo35,1971Bo36

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 114, 1189 (2013)	1-Apr-2013

$J^\pi(^{30}\text{Si})=0^+$.

1978Ik01: $^{30}\text{Si}(\text{pol d},\alpha)$: Target: Si foil of enriched 95.5% in ^{30}Si and SiO; Projectile: pol d, E=18.0 MeV. Alpha particles were momentum analyzed with an Enge split-pole magnetic spectrograph and detected with a position sensitive proportional counter. Measured $\sigma(\theta)$, deduced level energy, J^π , vector analyzing power.

1976Bo35: $^{30}\text{Si}(\text{pol d},\alpha)$, E=8 MeV and 12 MeV; α particles are detected using a Si surface barrier detector between 174.1° and 176.5° , FWHM=45 keV; deduced excited levels, natural and unnatural parities.

1971Bo36: $^{30}\text{Si}(\text{d},\alpha\gamma)$: 89% enriched ^{30}Si target, E=5.36 MeV; γ rays are measured using Ge(Li) detector at five different angles between 168° to 172° ; deduced level energy, decay scheme, γ -ray branching. Decay scheme up to 2658 keV level is reported. Also $^{26}\text{Mg}(^3\text{He},p\gamma)$ and $^{27}\text{Al}(\text{d},p\gamma)$ reactions are studied. γ ray and related properties are presented in the $^{27}\text{Al}(\text{d},p),(\text{d},p\gamma)$ dataset.

 ^{28}Al Levels

E(level) [†]	J^π [†] &	L [@]	Comments
0.0	<i>a</i>		
30.6382 7	<i>b</i>		
972.35 3	0 ⁺		J^π : Assigned in 1976Bo35 from very small cross section measurement.
1013.637 9	<i>a</i>		
1372.917 20	<i>a</i>	0,2	
1620.30 4			
1622.907 20			
2138.910 10	<i>b</i>		
2201.43 3	<i>a</i>	0,2	
2271.745 19	<i>b</i>		
2486.20 6	<i>b</i>		
2581.81 22	5 ⁺		J^π : From a combination of measurements of relative parities together with cross-section and vector-analyzing power angular distribution (1978Ik01). π =unnatural.
2656.30 4	<i>b</i>		
2987.94 12	<i>a</i>		
3012 [‡] 5	0 ⁺		J^π : Assigned in 1976Bo35 from other references. L=2 in (d,p), L=0 component for the doublet (2987 keV) in ($^3\text{He},p$), and no population in (n, γ).
3105 1	<i>a</i>		
3296.34 4	<i>a</i>	2	
3347.19 4	<i>b</i>		
3465.294 10	<i>a</i>		
3542.1 6	<i>a</i>		
3591.457 9	<i>b</i>		
3670.69 7	<i>a</i>		
3709.222 16	<i>a</i>		π =tentative.
3762 [‡] 5	(0 ⁺)		J^π : Assignment in 1976Bo35 from very low cross section.
3875.773 11	<i>a</i>		
3901.00 4	<i>a</i>		
3935.603 18	<i>b</i>		
4035 [‡] 4	<i>b</i>		
4115 [‡] 4	<i>a</i>		
4246 [‡] 4	<i>b</i>		
4310 [‡] 4	<i>a</i>		
4385 [‡] 4	<i>b</i>		

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$^{30}\text{Si}(\text{pol d},\alpha),(\text{d},\alpha),(\text{d},\alpha\gamma)$ [1978Ik01](#),[1976Bo35](#),[1971Bo36](#) (continued) ^{28}Al Levels (continued)

E(level) [†]	J ^π &	L [@]	Comments
4463 [‡] 5	<i>b</i>		π =tentative.
4517 4	3 ⁺ #	2	E(level): From 1976Bo35 . π =unnatural.
4596.56 4	3 ⁺ #	2	π =unnatural.
4691.097 6	<i>b</i>		π =tentative.
4739 2			
4764.922 10	<i>a</i>		
4848.73 10	<i>a</i>		
4903.577 6	<i>a</i>		
4926 [‡] 5	<i>a</i>		
4997.01 5	<i>b</i>		
5015.51 3	<i>a</i>		
5134.849 8	<i>b</i>		
5166 [‡] 5			
5176.96 6			
5190.4 3	<i>b</i>		π =tentative.
5287 [‡] 5	<i>b</i>		

[†] From Adopted Levels, except otherwise noted.

[‡] From [1976Bo35](#).

Two possibilities 1⁺,3⁺ from L=2 and unnatural parity. The analyzing power data, negative at forward angles, excludes 1⁺ ([1978Ik01](#)).

@ From the cross-section and vector analyzing-power in [1978Ik01](#).

& From [1976Bo35](#), except otherwise noted.

^a Unnatural.

^b Natural.