^{26}Mg(d,$\alpha\gamma$),(pol d,α)

History

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

(pol d,α) data from Boerma (D.O. Boerma, Jahresbericht ETH Zurich, 1975 as presented in 1990En08 − evaluators were unable to find a copy of the article to assign it a NSR reference number). ^{26}Mg(pol d,α) Measured analyzing power at 13 deuteron energies in the E_d=9-12 MeV region.

1971Bu21: The reaction ^{26}Mg(d,$\alpha\gamma$), E_d=5.05. The investigation was carried out using 98.8% enriched ^{26}Mg target. Gamma rays in coincidence with α-particles were detected. The emitted α-particles were detected using a thick annular silicon surface-barrier detector. The de-excited gamma rays were detected using a Ge(Li) detector. Measured σ(Eα,Eγ,$\Theta(\alpha\gamma)$).

1975Du03: The reaction ^{26}Mg(d,$\alpha\gamma$), E_d=4.5 MeV. Measured $\alpha\gamma$ coincidence. The lifetime measurement was carried out using recoil distance method. The silicon and Ge(Li) detectors were used.

Others: 1968Te08, 1969Sa15, 1970Li26, 1967Ja06.

^{24}Na Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0	4$^+$[@]		J$^\pi$: π(pol d,α)=N.
472	1$^+$[@]		J$^\pi$: π(pol d,α)=U.
563	2$^+$[@]	43 ps *6*	$T_{1/2}$: From τ=62 ps *8* (1975Du03 − recoil distance method). J$^\pi$: π(pol d,α)=(N).
1341			J$^\pi$: π(pol d,α)=N.
1344	3[#]		J$^\pi$: ≤3 in 1971Bu21.
1347	1$^+$[@]		
1508 *10*	3,5[#]		E(level): From 1967Ja06. Other: 1510 (1971Bu21). J$^\pi$: π(pol d,α)=U. Based on the missing population in ^{24}Ne β- decay, spin ≥4 is proposed (1967Ja06).
1846	0,1,2[#]		J$^\pi$: π(pol d,α)=N.
1885	1,2,3[#]		J$^\pi$: π(pol d,α)=U.
2513	1,2,3[#]		J$^\pi$: π(pol d,α)=U.
2561	4[#]		J$^\pi$: π(pol d,α)=N. J$^\pi$: ≤4 in 1971Bu21.
2905	3$^+$[#]		J$^\pi$: π(pol d,α)=U. J$^\pi$: Recommended 3$^+$ combining with other work and lifetime of the state. D(+Q) to 4$^+$. 1,2,3,4 from $\alpha\gamma$ angular correlation studies (1971Bu21).
2978			J$^\pi$: π(pol d,α)=(N).
3219	4[#]		J$^\pi$: π(pol d,α)=N. ≤4 in 1971Bu21.
3372			J$^\pi$: π(pol d,α)=U.
3410			J$^\pi$: π(pol d,α)=U.
3590			J$^\pi$: π(pol d,α)=U.
3630			J$^\pi$: π(pol d,α)=U.
3680	0$^+$		J$^\pi$: π(pol d,α)=N.
3750			J$^\pi$: π(pol d,α)=N.
3980			J$^\pi$: π(pol d,α)=N.
4150			J$^\pi$: π(pol d,α)=(U).
4190			J$^\pi$: π(pol d,α)=(U).
4210			J$^\pi$: π(pol d,α)=N.
4440			J$^\pi$: π(pol d,α)=U.
4468 *8*			
4535 *5*			J$^\pi$: π(pol d,α)=N.
4571 *7*			J$^\pi$: π(pol d,α)=N.
4629 *5*			J$^\pi$: π(pol d,α)=U.
4703 *7*			J$^\pi$: π(pol d,α)=U.

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^{26}Mg(d,$\alpha\gamma$),(pol d,α) (continued)

^{24}Na Levels (continued)

E(level)[†]	Comments
4772 *7*	J^π: π(pol d,α)=U.
4892 *6*	J^π: π(pol d,α)=U.
4931 *7*	J^π: π(pol d,α)=N.
4980 *7*	
5117 *7*	J^π: π(pol d,α)=N.
5160 *8*	
5200 *8*	J^π: π(pol d,α)=N.
5252 *8*	J^π: π(pol d,α)=N.
5347 *8*	J^π: π(pol d,α)=U.
5395 *8*	
5432 *8*	J^π: π(pol d,α)=N.
5585 *8*	J^π: π(pol d,α)=U.

[†] From 1971Bu21 for E<3400 and from Boerma (as given in 1990En08) for E>3400; unless otherwise stated. Levels without uncertainties for E > 3400 are from 1990En08.
[‡] From Boerma (as given in 1990En08), natural (N) and unnatural (U) parities from (pol d,α) studies are listed in comments, except where otherwise noted. The assignment should be considered with caution, not published − appears to be from a private communication.
[#] Proposed in 1971Bu21, based on α-γ angular correlation studies.
[@] From Adopted Levels. Listed to support other data in the dataset.

γ(^{24}Na)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
472	1^+	472	100	0	4^+			
563	2^+	91		472	1^+			
		563		0	4^+			
1341		869		472	1^+			
1344	3	781	50 *4*	563	2^+	D+Q		δ: +0.08 *3* or −6.3 *+12−33* (1971Bu21) for 3 to 2^+ transition.
		872	<5	472	1^+			E_γ: Not reported in other studies. Not adopted.
		1344	50 *4*	0	4^+	D+Q		δ: +0.00 *4* or −7.1 *+15−25* (1971Bu21) for 3 to 4^+ transition.
1347	1^+	875		472	1^+			
1508	3,5	1508	100	0	4^+	D+Q	−0.16 *4*	δ: For 5^+ to 4^+ transition (1971Bu21).
1846	0,1,2	499	51 *4*	1347	1^+			
		502[@]		1344	3			
		1283	12 *3*	563	2^+			
		1374	37 *3*	472	1^+	D+Q	+0.18 *7*	δ: For 2^+ to 1^+ transition (1971Bu21).
		1846	<2	0	4^+			E_γ: Not reported in other studies. Weaker γ. Not adopted.
1885	1,2,3	1322	69 *3*	563	2^+	D+Q		δ: +0.02 *2* or −4.7 *4* (1971Bu21) for 3^+ to 2^+ transition, −0.76 *+6−12* for 2^+ to 2^+ transition.
		1885	31 *3*	0	4^+	D+Q		δ: −0.07 *2* or −5.4 *4* (1971Bu21) for 3^+ to 4^+ transition, +0.20 *7* for 2^+ to 2^+ transition.
2513	1,2,3	1950	100	563	2^+			
		2513[@]		0	4^+			
2561	4	1051	10 *4*	1508	3,5			
		1217	43 *8*	1344	3			
		2561	47 *8*	0	4^+			
2905	3^+	1020	2 *2*	1885	1,2,3			
		1059	3 *2*	1846	0,1,2			

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^{26}Mg(d,$\alpha\gamma$),(pol d,α) (continued)

$\gamma(^{24}Na)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
2905	3^+	1558	<55	1347	1^+			
		1561	30 *10*	1344	3			
		1564	<55	1341				
		2342	5 *3*	563	2^+			
		2905	15 *5*	0	4^+	D(+Q)	<+0.14	
2978		1637	40 *8*	1341				
		2415	32 *7*	563	2^+			
		2506	28 *9*	472	1^+			
3219	4	1876	100	1344	3			E_γ: A comparable 1875.6γ placed from 6072.76 keV level in (n,γ).
3372		2025	<85	1347	1^+			
		2028	<85	1344	3			
		2031	<85	1341				
		2809	25 *10*	563	2^+			

[†] From level energy difference, recoil energy subtracted, rounded value to keV. Placement as of 1971Bu21.
[‡] From 1971Bu21.
[#] From 1971Bu21. Multipolarity from α-γ angular correlation measurements (data not listed).
[@] Placement of transition in the level scheme is uncertain.

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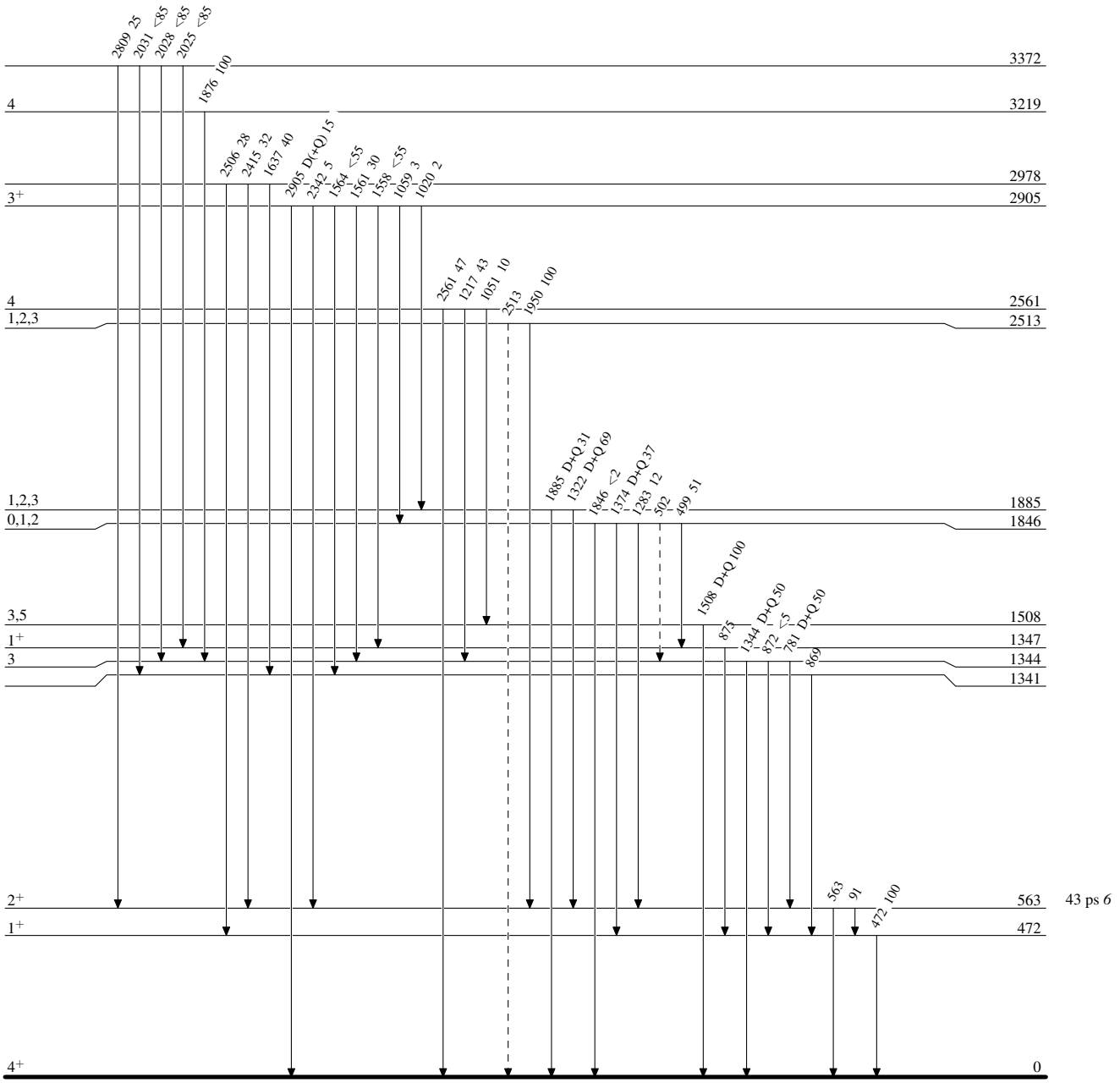
Legend

Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{24}_{11}Na_{13}$