^{22}Ne(^{3}He,d),(^{3}He,dγ) 1971Po11,2002Ha03,1991Ho09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171,1 (2021)	1-Jun-2020

J^π(^{22}Ne)=0$^+$.
Others: 1968Du03, 1967Du08.
1971Po11: ^{22}Ne(^{3}He,d) E=15 MeV. Measured $\sigma(E_d,\theta)$. FWHM 22 keV.
2002Ha03: ^{22}Ne(^{3}He,d) E=20 MeV. Measured E_d, $\sigma(\theta)$.
1991Ho09: ^{22}Ne(^{3}He,d) E=20.2 MeV. Measured $\sigma(E_d,\theta)$.
1968Du03: ^{22}Ne(^{3}He,dγ) E=10 MeV. Measured $\sigma(E_d,E_\gamma)$.
1967Du08: ^{22}Ne(^{3}He,d) E=10, 12 MeV. Measured $\sigma(E_d,\theta)$. FWHM <60 keV.

2020Sa09: Fitted angular distribution of experimental (^{3}He,d) data in the literature with finite-range DWBA. Deduced spectroscopic factors for g.s., excited states, including the subthreshold resonance state at 8664 keV. A systematic R-matrix analysis of direct capture to the bound states and the decay of the 8664 keV to the g.s.

^{23}Na Levels

E(level)[†]	J^π	L[†]	S[a]	Comments
0.0	3/2$^+$	2	0.32	S: Others: C^{2}S=0.08 (1991Ho09) and 0.082 *12* (2020Sa09).
439 *9*	5/2$^+$	2	2.10	S: Others: C^{2}S=0.34 (1991Ho09) and 0.38 *8* (2020Sa09).
2078 *9*			≤0.18	E(level): Other: 2080 *10* (1967Du08).
2392 *7*	1/2$^+$	0	0.50	E(level): Other: 2391 *5* (1967Du08). S: Others: (2J$_f$+1)S=1.1 (1967Du08). C^{2}S=0.25 (1991Ho09) and 0.26 *5* (2020Sa09).
2642[#] *10*	1/2$^-$	1	0.043	S: Others: (2J$_f$+1)S=0.04 (1967Du08). C^{2}S=0.020 (1991Ho09).
2704[#] *6*			≤0.36	
2983[#] *7*	3/2$^+$	2	1.28	S: Others: (2J$_f$+1)S=1.3 (1967Du08). C^{2}S=0.32 (1991Ho09) and 0.35 *4* (2020Sa09).
3679[#] *7*	3/2$^-$	1	0.076	E(level): Other: 3681 *12* (1967Du08). S: Other: (2J$_f$+1)S=0.1 (1967Du08).
3852[#] *8*	5/2$^-$	3[&]	0.033	S: Others: (2J$_f$+1)S=0.06 (1967Du08). C^{2}S=0.010 (1991Ho09).
3918[#] *7*	5/2$^+$	2	0.27	S: Others: (2J$_f$+1)S=0.45 (1967Du08). C^{2}S=0.046 (1991Ho09).
4435[#] *8*	1/2$^+$	0[&]	0.006	S: Others: (2J$_f$+1)S=0.002 (1967Du08). C^{2}S<0.0033 (1991Ho09).
4777[#] *8*			≤0.16	
5378[#] *7*	5/2$^+$	2	0.074	S: Other: (2J$_f$+1)S=0.07 (1967Du08).
5536[#] *9*				
5740 *8*	5/2$^+$	2[&]	0.21	E(level): Other: 5747 *20* (1967Du08) − possible doublet. S: Other: (2J$_f$+1)S ≤0.55 (1967Du08).
5762 *10*		2,(1)		
5776 *20*				
5932[#] *7*				
5968[#] *5*				
6039[#] *7*				
6116 *5*				
6193[#] *8*				
6232 *10*				
6307[#] *5*	1/2$^+$	0	0.27	S: Others: (2J$_f$+1)S=0.75 (1967Du08). C^{2}S=0.14 *2* (2020Sa09).
6343 *9*				
6576 *5*				
6618[#] *5*				
6733[#] *5*	3/2$^+$	2	0.030	S: Other: (2J$_f$+1)S=0.04 (1967Du08).

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^{22}Ne(^{3}He,d),(^{3}He,dγ) 1971Po11,2002Ha03,1991Ho09 (continued)

^{23}Na Levels (continued)

E(level)[†]	Jπ	L[†]	S[a]	Comments
6819 5				
6866 6	3/2+,5/2+	2	0.032	
6917 5	3/2−	1	0.30	E(level): Other: 6924 30 (1967Du08) − possible doublet. S: Others: (2Jf+1)S ≤1.2 (1967Du08). C^2S=0.18 4 (2020Sa09) for J^π=1/2−.
6943 10	(3/2+)	(2)	0.18	
7079[#] 6	3/2−	1	0.17	S: Other: (2Jf+1)S=0.6 (1967Du08).
7130 6	3/2+,5/2+	2	0.065	
7179 7				
7275[#] 7		2,3	0.058	S: and 0.24 for L=2 and 3, respectively (1971Po11).
7386 10	1/2−,3/2−	1	0.034	
7409 10				
7451 6	(3/2+,5/2+)	2	0.58	E(level): Other: 7449 30 (1967Du08) − possible doublet. S: Other: (2Jf+1)S ≤1.1 (1967Du08).
7482 9	(1/2,3/2)−	1	0.15	
7565 6				
7683 6				
7725 11				
7754[#] 6		(3)	0.084	S: Others: 0.028, 0.052, and 0.33 for L=2, 3, and 4, respectively (2002Ha03).
7839 10				
7889[#] 5	5/2+	2	0.57[b]	S: Other: (2Jf+1)S=0.06 (1967Du08).
7960 5				
7982 12				
8063 8				
8101 12				
8122 7				
8149 5				
8173 7				
8220 5				
8254 5		(1)	0.011	
8302 5		3,(2)	0.49	S: 0.49 and 0.15 for L=3 and (2).
8355 5		3,(2)	0.16	S: 0.16 and 0.054 for L=3 and (2).
8416[#] 5		(2)	0.18	
8468 5		2	0.077	
8498 6				
8555 5				
8602 5				
8646 10				
8663[#] 5	1/2+	0	0.59[b]	S: Others: (2Jf+1)S=0.63 (1967Du08). (2Jf+1)C^2S=0.54 (1971Po11). C^2S=0.32 5 (2020Sa09).
8721 7				
8793 5				
8830[‡] 3	1/2+	0	0.039[b]	
8862?[‡@]	1/2+	0[‡]	≤0.0015[b]	
8894?[‡@]	1/2+	0[‡]	≤0.0016[b]	
8946[‡] 3	5/2−,7/2−	3[‡]	≤0.0087[b]	
8973[‡] 3	3/2+,5/2+	2[‡]	0.005[b]	
9000				
9044[‡] 3		4[‡]	0.02[b]	
9108 6				
9167 6				
9215[‡] 3		0,1[‡]		
9257[‡] 3	1/2+	0[‡]	0.079[b]	

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$^{22}Ne(^{3}He,d),(^{3}He,d\gamma)$ 1971Po11,2002Ha03,1991Ho09 (continued)

^{23}Na Levels (continued)

E(level)[†]	J^{π}	L[†]	S[a]	Comments
9282 *5*				
9320 *5*				
9398 *5*		1,(2)	(0.039)	S: (0.039) and (0.032) for L=1 and (2).
9426 *6*				
9482 *5*				
9540 *7*				
9588				
9608 *7*	$3/2^+$	2[‡]	0.082[b]	Γp=6.3 eV, 2002Ha03.
9648 *7*				
9680 *7*				
9704 *5*	$3/2^+$	2[‡]	0.084[b]	Γp=12.4 eV, 2002Ha03.
9730 *5*				
9758 *5*				
9818 *5*				
9844 *5*	$3/2^+$	2[‡]	0.20	Γp=35.3 eV, 2002Ha03. S: Other: 0.11 (($2J_f+1)C^2S$ in 2002Ha03).
9887 *8*				
9925 *6*				
9944 *10*				
10018 *10*		2,(3)	(0.18)	S: (0.18) and (0.40) for L=2 and (3).
10035 *10*				
10077 *10*				
10173 *10*				
10218 *10*				

† From 1971Po11, except as noted. Excitation energies reported in 1967Du08 are marked by footnote and mostly in good agreement but less precise.
‡ From 2002Ha03.
\# Also reported in 1967Du08.
@ Resonance level was not observed at any angle in 2002Ha03.
& From 1991Ho09.
a $(2J_f+1)C^2S$ from 1971Po11, except where otherwise noted.
b From 2002Ha03.

$\gamma(^{23}Na)$

E_i(level)	J_i^{π}	E_γ[†]	I_γ[†]	E_f	J_f^{π}
439	$5/2^+$	439		0.0	$3/2^+$
2392	$1/2^+$	1955	30 *4*	439	$5/2^+$
		2393	70 *4*	0.0	$3/2^+$

† From 1968Du03.

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Level Scheme

Intensities: % photon branching from each level