^{64}Ni(^{3}He,t) 2009Po07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

2009Po07 (also 2005Po17,2006Gr08): ^{3}He beam produced at E(^{3}He)=140 MeV/nucleon by the K=400 Ring Cyclotron at RCNP, Osaka. Tritons were detected using a focal-plane detector system and momentum analyzed using the Grand Raiden spectrometer. Measured excitation energies of Gamow-Teller transitions and angular distributions. FWHM=32 keV. Deduced Gamow-Teller strengths.

1971Be29: E=24.6 MeV, magnetic spectrograph. Authors report two groups at 6810 and 6826.

Others:

1971Fa03 (also 1971FaZL,1969Ku09): E=37.7 MeV. Measured $\sigma(\theta)$ for analogs of g.s. and first 2^+ state of ^{64}Ni.

1966Sh02, 1966Ya06: E=18 MeV. IAR of ^{64}Ni g.s.

Additional information 1.

Coulomb displacement energy=9282 *7* (cross section weighted average of 9271 *6* and 9287 *6* for two components of g.s. analog) (1971Be29). Other: 9273 *25* (1966Sh02).

^{64}Cu Levels

With T=4 for ^{64}Ni, the excited states in ^{64}Cu populated in (^{3}He,t) reaction are expected to have T=3,4,5.

E(level)[†]	J$^{\pi}$	L[†]	B(GT$^-$)
0	1^{+m}	0	0.123 *2*
159 *10*		≥1	
277 *10*		≥1	
344 *10*	1^{+m}	0	0.037 *3*
365 *10*		≥1	
606 *10*		≥1	
663 *10*	1^{+m}	0	0.006 *1*
745 *10*		≥1	
926 *10*	1^{+m}	0	0.426 *13*
1296 *10*	1^{+m}	0	0.129 *5*
1357 *10*			
1435 *10*			
1499 *10*	1^{+m}	0	0.059 *3*
1591 *10*			
1683 *10*		≥1	
1775 *10*			
1850 *10*			
1911 *10*		1	
2016 *10*		≥1	
2061 *10*			
2280 *10*	1^{+m}	0[‡]	0.114[‡] *4*
2301 *10*	1^{+m}	0[‡]	0.114[‡] *4*
2350 *10*			
2386 *10*		≥1	
2470 *10*		≥1	
2511 *10*		≥1	
2643 *10*	1^{+m}	0	0.125 *4*
2723 *10*		≥1	
2760 *10*		≥1	
2821 *10*		≥1	
2854 *10*		0	0.014 *1*
2905 *10*		0	0.017 *1*
2981 *10*		≥1	
3024 *10*		≥1	

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^{64}Ni(^{3}He,t) 2009Po07 (continued)

^{64}Cu Levels (continued)

E(level)†	Jπ	L†	B(GT−)	Comments
3064 *10*				
3122 *10*				
3185 *10*				
3207 *10*				
3252 *10*				
3303 *10*		≥1		
3339 *10*				
3522 *10*		0	0.016 *1*	
3674 *10*		0#	0.032# *1*	
3705 *10*		0#	0.032# *1*	
3804 *10*		0@	0.033@ *1*	
3827 *10*		0@	0.033@ *1*	
3966 *10*	1+*l*	&	&	
3995 *10*		&	&	
4031 *10*		&	&	
4063 *10*	1+*l*	&	&	
4101 *10*		&	&	
4136 *10*		&	&	
4205 *10*		0*a*	0.054*a* *2*	
4222 *10*		0*a*	0.054*a* *2*	
4293 *10*	1+*m*	0*b*	0.077*b* *3*	
4311 *10*		0*b*	0.077*b* *3*	
4373 *10*		*c*	*c*	
4413 *10*		*c*	*c*	E(level): 4313 in Table II of 2009Po07 seems a misprint.
4452 *10*		*c*	*c*	
4599 *10*	*n*	0*d*	0.085*d* *3*	
4630 *10*	*n*	0*d*	0.085*d* *3*	
4744 *10*		0	0.016 *1*	
4877 *10*		*e*	*e*	
4916 *10*		*e*	*e*	
4957 *10*		*e*	*e*	
5000 *10*		*e*	*e*	
5030 *10*		*e*	*e*	
5053 *10*	1+	*e*	*e*	Jπ: 1+ suggested in Fig. 1 of 2009Po07, (1+) in Fig. 2 of 2008Gr10. L=0 is assigned in 2009Po07 for a group of seven levels between 4877 and 5116.
5116 *10*		*e*	*e*	
5198 *10*		0*f*	0.055*f* *2*	
5227 *10*		0*f*	0.055*f* *2*	
5322 *10*		0	0.025 *2*	
5397 *10*		0	0.030 *2*	
5513 *10*		0	0.021 *2*	
5569 *10*		0*g*	0.021*g* *1*	
5617 *10*		0*g*	0.021*g* *1*	
5665 *10*		0*h*	0.030*h* *1*	
5705 *10*		0*h*	0.030*h* *1*	
5809 *10*		*i*	*i*	
5864 *10*		*i*	*i*	
5922 *10*		*i*	*i*	
5967 *10*		*i*	*i*	
6003 *10*		*i*	*i*	

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^{64}Ni(^{3}He,t) 2009Po07 (continued)

^{64}Cu Levels (continued)

E(level)[†]	Jπ	L[†]	B(GT⁻)	Comments
6116 *10*		*i*	*i*	
6156 *10*		*i*	*i*	
6201 *10*		*i*	*i*	
6321 *10*		0	0.044 *2*	
6413 *10*		0	0.065 *3*	
6464 *10*		*j*	*j*	
6493 *10*		*j*	*j*	E(level): 4493 in Table II of 2009Po07 seems a misprint.
6529 *10*		*j*	*j*	
6570 *10*		*j*	*j*	
6740 *10*		0	0.048 *4*	
6810[k] *6*	0+	0[k]		E(level): from 1971Be29. Other: 6809 *10* (2009Po07). dσ/dΩ(18°)=37 μb/sr *7* (1971Be29).
6826[k] *6*	0+	0[k]		E(level): from 1971Be29. Other: 6825 *10* (2009Po07). dσ/dΩ(18°)=100 μb/sr *20* (1971Be29).

[†] From 2009Po07. Uncertainty for excitation energy is estimated by 2009Po07 as 10 keV. At about 10 MeV, a bump-like structure (GT: giant-resonance) dominates the spectrum.
[‡] Combined values for 2280 and 2301 levels.
[#] Combined values for 3674 and 3705 levels.
[@] Combined values for 3804 and 3827 levels.
[&] L=0, B(GT⁻)=0.373 *11* for composite of 3966, 3995, 4031, 4063, 4101, 4136 levels.
[a] Combined values for 4205 and 4222 levels.
[b] Combined values for 4293 and 4311 levels.
[c] L=0, B(GT⁻)=0.065 *2* for composite of 4373, 4413, 4452 levels.
[d] Combined values for 4599 and 4630 levels.
[e] L=0, B(GT⁻)=0.331 *6* for composite of 4877, 4916, 4957, 5000, 5030, 5053, 5116 levels.
[f] Combined values for 5198 and 5227 levels.
[g] Combined values for 5569 and 5617 levels.
[h] Combined values for 5665 and 5705 levels.
[i] L=0, B(GT⁻)=0.220 *6* for composite of 5809, 5864, 5922, 5967, 6003, 6116, 6156, 6201 levels.
[j] L=0, B(GT⁻)=0.045 *2* for composite of 6464, 6493, 6529, 6570 levels.
[k] L=0 for 6809+6825 levels; IAS of ^{64}Ni g.s. The doublet is the most intense peak in the (^{3}He,t) spectrum.
[l] 1+ suggested in Fig. 1 of 2009Po07 and in Fig. 2 of 2008Gr10. L=0 is assigned in 2009Po07 for a group of six levels between 3966 and 4136.
[m] 1+ suggested in Fig. 1 of 2009Po07 and/or in Fig. 2 of 2008Gr10.
[n] 1+ suggested in Fig. 2 of 2008Gr10 for 4599 and/or 4630.