^{48}Ca(p,Xγ): other ^{49}Ca IAR's 1979Na10,1976Di04,1975Fo12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows[a]	NDS 109, 1879 (2008)	14-Jul-2008

^{49}Sc Levels

1975Fo12: (p,p),(p,p′) E=8.0-10.2 MeV. Measured $\sigma(\theta)$; Si′s.
1979Na10: (p,p),(p,p′) E=5.55-5.84 MeV. Measured $\sigma(\theta)$ and excitation functions; Si′s. θ=90°−150°.
All data and arguments from 1979Na10, except As noted.

TVProton Decays of Isobaric Analog States

E(p),Lab ±10 keV	J^π	l	j	Γ_p(keV)	^{48}Ca* ±≈25%	Interference
5594	5/2⁻	1		1.11	3831.72	TV0.999p3/2+0.001p1/2 or 0.001p3/2+0.999p1/2
5974	(3/2⁻)	1		0.58	3831.72	
6058 *5*	5/2⁻	1		1.6 *7*	3831.72	TV0.79p3/2+0.21p1/2 or 0.26p3/2+0.74p1/2
6118 *5*	9/2⁺	1	3/2	0.4 *2*	4506.9	
6379						
6529	5/2⁺	1		2.0	4506.9	TV0.9p3/2+0.1p1/2 or 0.05p3/2+0.95p1/2
7023	7/2⁺	1		0.3	4506.9	TV0.95p3/2+0.05p1/2 or 0.005p3/2+0.995p1/2
7518	9/2⁺	1	1/2	0.59	5729	
		1	3/2	2.2	4506.9	
8200	5/2⁺	1		72.	4506.9	TV0.96p3/2+0.04p1/2 or 0.11p3/2+0.89p1/2

TV* From the evaluation of 1985Al14. J^π=2⁺, 3⁻, and 5⁻ for the 3832, 4507, and 5729 states, respectively.

E(level)[†]	J^π[‡]	Γ[#]	L[@]	Γ_p/Γ_p(S.P.)[†]	Comments
0.	7/2⁻[&]				
2.37×10³	3/2⁺[&]				unresolved 2.23- and 2.37-MeV doublet. Primary γ assumed to populate 3/2⁺ state (1976Di04).
3.08×10³	3/2⁻[&]				
S(p)+4026 *4*	(1/2⁻)	226 keV *3*	1	1.25	Γ_p=151 keV *2*; Γ_n=52 keV *1* E(level),Γ,Γ_p/Γ_p(S.P.): from 1982Si19. Neutron S-factor given. See ^{48}Ca(p,Xγ) IAR: ^{49}Ca g.s. for details. E(level),WIDTHP/WIDTHP(S.P.): from 1982Si19. Neutron S-factor given. See ^{48}Ca(p,Xγ) IAR: ^{49}Sc g.s. for details. J^π,L: from 1966Jo03: J^π As suggested by 1964Ka03 from shell model applied to their data on ^{48}Ca(d,p). Γ_p,Γ_n: from 1982Si19 by analysis of average resonance shape. IAS(^{49}Ca first-excited).
S(p)+5594 *10*	5/2⁻	12.8 keV *13*	3	0.11 *3*	IAS(^{49}Ca 3595).
S(p)+5974 *10*	(3/2⁻)	19.3 keV *20*	1	0.0037 *10*	IAS(^{49}Ca 3861).
S(p)+6058[a] *5*	5/2⁻	31[b] keV *8*	3	0.64 *26*	IAS(^{49}Ca 4005).
S(p)+6118[a] *5*	9/2⁺	18[b] keV *5*	4	0.32 *13*	IAS(^{49}Ca 4024).
S(p)+6379 *10*	3/2⁺	19.8 keV *20*	2	0.005 *2*	IAS(^{49}Ca 4279).
S(p)+6529 *10*	5/2⁺	25.6 keV *26*	2	0.021 *6*	IAS(^{49}Ca 4422).
S(p)+7023 *10*	7/2⁺	14.8 keV *15*	4	0.11 *3*	IAS(^{49}Ca 4885).
S(p)+7518 *10*	9/2⁺	18.8 keV *19*	4	0.056 *14*	IAS(^{49}Ca 5387).
S(p)+8200 *10*	5/2⁺	108 keV *11*	2	0.018 *5*	IAS(^{49}Ca 6095).
S(p)+8.70×10³[c]	5/2⁺[c]		2[c]		IAS(^{49}Ca≈6.7 MeV)?
S(p)+8.90×10³[c]	5/2⁺[c]		2[c]		IAS(^{49}Ca≈6.9 MeV)?

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^{48}Ca(p,Xγ): other ^{49}Ca IAR′s 1979Na10,1976Di04,1975Fo12 (continued)

^{49}Sc Levels (continued)

† S(p)=9627.2 keV *29* (2003Au03). Except As noted, resonance energies and $\Gamma_{p'}$S are from 1979Na10 obtained by a best fit comparison of the elastic scattering excitation curves to multi-level calculations. $\Gamma_{p'}$S are In agreement with results from ^{48}Ca(d,p).
‡ From $\sigma(\theta)$ of inelastic scattered protons leading to 2^+ and 3^- excited states In ^{48}Ca, except As noted.
# Average of values obtained by a best fit comparison of the elastic scattering excitation curves to multi-level calculations and and values obtained directly from the shape of resonances In the inelastic channels.
@ From shapes of the resonances In elastic scattering excitation curves.
& From the Adopted Levels.
a From 1976Di04. 6070 *10* and 6117 *10* from 1979Na10.
b For these two resonances, Γ from inelastic data was≈60% of that from elastic data.
c From 1975Fo12.

γ(^{49}Sc)

All data are from 1976Di04, except As noted.

E_γ†	Γ_γ, eV‡	E_i(level)	J^π_i	E_f	J^π_f	Comments
12478	>1.7	S(p)+6058	5/2$^-$	3.08×10^3	3/2$^-$	
13191	1.4 *5*	S(p)+6058	5/2$^-$	2.37×10^3	3/2$^+$	
15481		S(p)+5974	(3/2$^-$)			
15563	17 *5*	S(p)+6058	5/2$^-$			
15622	22	S(p)+6118	9/2$^+$			ΔIγ=+22-11

† Calculated by the evaluator from difference In the adopted excitation energies.
‡ From Breit-Wigner calculations.

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