^{208}Pb(α,t) 1985Ga01,1980Gr09,1984Ga37

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Chen # and F. G. Kondev	NDS 126, 373 (2015)	30-Sep-2013

Target ^{208}Pb J^π(g.s.)=0$^+$.

1985Ga01: E=80 MeV α beam was produced from the K90 isochronous Institut de Physique Nucleaire (ISN) Grenoble cyclotron. Targets were 98% enriched ^{208}Pb of 6 and 1 mg/cm^2 thick. Tritons were momentum analyzed by the quadrupole-dipole (QD) magnetic spectrometer and detected by a gas delay-line counter backed by two plastic scintillators, FWHM=60 keV. Measured σ(E$_t$,θ). Deduced levels, L, J^π from DWBA analysis.

1980Gr09: E=40 MeV α beam was produced from the Princeton Cyclotron. Targets were 65-160 μg/cm^2 thick 99% enriched ^{208}Pb on 5 and 10 μg/cm^2 carbon backings. Tritons were momentum analyzed with the Princeton quadrupole-three dipole (Q-3D) magnetic spectrograph and detected by a single-wire charge-division position-sensitive proportional counter, FWHM=10-14 keV. Measured σ(E$_d$,θ). Deduced levels, J^π, spectroscopic factors from DWBA analysis.

1984Ga37: E= 80 MeV α beam was produced from the Grenoble cyclotron. Tritons were momentum analyzed with a QD spectrometer and detected by a gas delay-line counter, FWHM=50 keV. Measured $\sigma(\theta)$. Deduced levels, Γ, spectroscopic factors.

Others: 1967Li09, 1981Pe10 (studied the energy dependence of the spectroscopic factors at 39.8, 61.5, and 81.4 MeV), 1985IsZV, 1985OhZS, 1985OhZX, 1986IsZX. See also 1985Sa34 for a comparison of these excitation energies with a calculation based on the coupling of the proton states with eight collective surface vibrational states in ^{208}Pb.

^{209}Bi Levels

E(level)†	J^π@	L&	C^2Sa	Comments
0	9/2$^-$	5	0.80	
899‡ *1*	7/2$^-$	3	0.76	C^2S: 0.89 normalized to unity for the ground-state (1980Gr09).
1608‡ *2*	13/2$^+$	6	0.74	C^2S: 1.05 normalized to unity for the ground-state (1980Gr09).
2499 *7*	3/2$^+$	2	0.014	
2601‡ *3*	13/2$^+$	6	0.065	C^2S: 0.09 normalized to unity for the ground-state (1980Gr09).
2826‡ *3*	5/2$^-$	3	0.57	C^2S: 0.65 normalized to unity for the ground-state (1980Gr09).
3139 *15*	3/2$^-$	1	0.44	
3410 *15*	13/2$^+$	6	0.03	
3503 *15*	5/2$^-$,7/2$^-$	3	0.04,0.03	
3650 *15*	1/2$^-$	1	0.20	
3707 *15*				
3835 *15*	13/2$^+$	6	0.03	
3927 *15*		≥7		
4019 *25*		≥7		
4174 *25*	15/2$^-$	7	0.045	
4247 *25*	15/2$^-$	7	0.06	
4459 *25*	1/2$^-$ & 7/2$^-$	1+3	0.10+0.10	
4543 *25*	15/2$^-$	(7)	<0.02	
4613 *25*	5/2$^-$,7/2$^-$	3	0.06,0.05	
4700 *25*				
4795 *25*	11/2$^+$,13/2$^+$	6	0.04	
4886 *25*	15/2$^-$	7	0.02	
4998 *25*	15/2$^-$	7	0.03	
5087 *25*	5/2$^-$	3	0.07	
5173 *25*	5/2$^-$	3	0.07	
5277 *25*	15/2$^-$	7	0.04	
5380 *25*	15/2$^-$	7	0.03	
5469 *25*	11/2$^+$	6	0.06	
5580 *25*	11/2$^+$	6	0.04	
5693 *25*	3/2$^+$,5/2$^+$	(2)	0.15	
7.2×10^3# *2*		6#	0.15#	
8.7×10^3# *5*		(6+7)#	≈1.0#	

Continued on next page (footnotes at end of table)

^{208}Pb(α,t) 1985Ga01,1980Gr09,1984Ga37 (continued)

^{209}Bi Levels (continued)

† From 1985Ga01, unless otherwise noted.
‡ From 1980Gr09.
# From 1984Ga37. Γ(7.2E2)=0.63 MeV *20*, Γ(8.7E3)= 5.3 MeV *10*.
@ From 1985Ga01, assumed by the authors for the extraction of C^2S.
& From comparison of experimental cross sections with DWBA predictions (1985Ga01).
a Spectroscopic factor $C^2S=(\sigma(\theta)^{exp}/\sigma(\theta)^{DWBA})/(N\times g)$, where N=36 (1985Ga01) is the normalization factor and $g=(2J_f+1)/(2J_i+1)$.