^{209}Bi(d,^{3}He)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 108,1583 (2007)	1-Jun-2007

1970Mc08 E=50 MeV, FWHM=60-75 keV.
1982Ha51 E=50 MeV, FWHM≈25 keV, θ=6° to 24°.
1983Ma07 E=45 MeV, FWHM=12 keV, θ=5° to 23°.
1987Gr21 E=45 MeV, FWHM=12-15 keV, θ=5° to 30°.
Other: 1973Ro38. The authors estimate the mean square neutron-proton radius difference to Be 0.16 fm 10.
Data of 1987Gr21 supersede those of 1983Ma07.
J^{π}(^{209}Bi)=9/2$^-$.

^{208}Pb Levels

E(level)†	L$^{\#}$	C^{2}S$^{\&}$	Comments
0			
2607 *6*	2	0.12	
3197 *3*	0	0.07	
3475 *2*	0	0.01	
3710 *1*	0+2	0.36+0.11	
3948 *2*	0+2	0.71+0.17	J^{π}: J=4 from the observed L=0 3s$_{1/2}$ strength, given that the 3710 and 3963 levels have J^{π}=5$^-$ (adopted values).
3963 *2*	0+2	0.46+0.12	
3997 *4*	0	0.04	
4051 *3*	0	0.01	
4084 *3*	5	0.03	
4126 *2*	0+2	0.03+0.55	
4144 *5*	5	0.08	
4181 *3*	0+2	0.01+0.03	
4210 *3*	2	0.05	
4251 *4*	0$^{@}$	0.06	
4262 *2*	2$^{@}$	1.05	
4298 *3*	0+2	0.07+0.26	
4325 *5*	5	0.17	
4359 *3*	0+2	0.02+0.28	
4384 *2*	2	1.24	J^{π}: J=6 from the observed L=2 2d$_{3/2}$ strength. This assignment exhausts 95% of the sum rule.
4421 *3*	5	0.27	
4447 *5*	2	0.01	
4481 *1*	2	0.14	
4610 *1*	5	0.19	
4691 *4*	2	0.05	
4707 *3*	2	0.22	
4860 *2*	5	0.25	
4894 *2*	5	0.61	
4937 *2*	2	0.08	
5067 *3*	5	0.74	
5084 *2*	2	0.18	
5097 *3*	5	0.21	
5129 *6*	2	0.03	
5160 *3*	5	1.71	
5191 *5*	5	1.86	
5210 *5*	5	1.17	
5234 *5*	5	0.26	
5278 *5*	2	0.02	
5314 *3*	5	0.42	
5335 *4*	5	0.52	
5352 *6*	5	0.06	

^{209}Bi(d,^{3}He) (continued)

^{208}Pb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	L[#]	C^{2}S[&]	Comments
5378 *3*		2	0.20	
5388 *5*		5	0.10	
5473 *6*		5	0.47	
5487 *2*		2	1.33	J$^{\pi}$: J=6 from the observed L=2 2d$_{5/2}$ strength, given that the J=7 strength is exhausted by the 5541 level.
5524 *9*		5	0.54	
5541 *2*		2	1.76	J$^{\pi}$: J=7 from the observed L=2 2d$_{5/2}$ strength. J$^{\pi}$=7$^-$ is established In (e,e′).
5581 *6*		2	0.04	
5627 *5*		5	0.11	
5643 *4*		2	0.50	
5665 *5*		2	0.53	
5680 *6*		2	0.54	
5688 *6*		5	0.51	
5704 *6*		2	0.06	
5710 *6*		5	0.40	
5727 *6*		5	0.10	
5753 *4*		5	0.08	
5773 *4*		2	0.20	
5790 *4*		5	0.06	
5821 *3*		5	0.19	
5841 *3*	1$^+$	5	0.17	configuration: J$^{\pi}$ is the adopted value. On the basis of their spectroscopic factor and the partial branching data In the (pol γ,γ') data of 1982Wi06, 1987Gr21 (see also 1986Ma55) suggest that this 1$^+$ state is isoscalar. This conclusion is In disagreement with that of 1987Sc19 In (e,e′), who show that isoscalar-isovector mixing is required to reproduce the form factor.
5867 *4*		5	0.06	
5881 *4*		2	0.13	
5902 *4*		5	0.05	
5922 *3*		5	0.29	
5944 *5*		5	0.13	
5996 *5*		2	0.05	
6071 *5*		2	0.01	
6183 *5*		5	0.01	
6249 *7*		2	0.07	
6465 *7*		2	0.02	
6529 *7*		2	0.07	
6609 *7*		2	0.03	

[†] From 1987Gr21.

[‡] 1987Gr21 propose assignments based In part on sum rule arguments. Some of the authors′ assignments are given In comments. See 1987Gr21 for a detailed discussion.

[#] From 1987Gr21. Others: 1970Mc08, 1982Ha51.

[@] L(4251)=0 is not consistent with the adopted J$^{\pi}$=3$^-$. Note that the adopted energy for this level (rounded off) is 4255, only 7 keV lower than the 4262 level, with J$^{\pi}$=4$^-$ and thus L=0 and/or 2. The discrepancy May thus Be due to incomplete resolution of the two levels.

[&] From 1987Gr21 based on normalization, for each orbital, to the 3s$_{1/2}$, 2d$_{3/2}$, 1h$_{11/2}$ and 2d$_{5/2}$ hole states populated In ^{207}Tl by the ^{208}Pb(d,^{3}He) reaction and assumed to have S=2J+1. the (d,^{3}He) reaction is expected to populate states In ^{208}Pb with configuration=π1h$_{9/2}$$\pi$(nlj)$^{-1}$. 1987Gr21 assign d$_{3/2}$ to L=2 levels up to and including the 4711 level and d$_{5/2}$ to the higher L=2 levels. 1982Ha51 report that the summed yield of the L=5 levels is 89% 10 of the yield of the 11/2$^-$ state In ^{207}Tl As determined In ^{208}Pb(d,^{3}He).