^{209}Bi(α,t) E=40 MeV 1980Gr09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 121, 561 (2014)	31-Mar-2014

Others: 1971LaZZ Eα=30 MeV, 1971Ti01 Eα=45 MeV; 1983Sh04, 1984La31.
Measured differential cross sections with pc-Q3D spectrometer; resolution=10-14 keV (FWHM).
Q(α,t)=−14.830 MeV.

^{210}Po Levels

L-transfers are deduced from E(level) dependence of (^{3}He,d)/(α,t) cross-section ratio compared with calc.
(α,t) reaction favors cross sections to large L-transfer states (L≈5).
Exp C^2S' sums correspond with monopole sum rule limits of 8.8,8.0,14.0,6.0 for respective p-p configuration=($h_{9/2}$, $h_{9/2}$),($h_{9/2}$,$f_{7/2}$),($h_{9/2}$,$i_{13/2}$),($h_{9/2}$,$f_{5/2}$).

E(level)	Jπ[†]	S[‡]	Comments
0[#]	0^+		S: g.s. cross section not measured.
1181[#] *1*	2^+	1.00 *6*	C^2S'=1.0 theory.
1426[#] *1*	4^+	1.79 *7*	C^2S'=1.8 theory.
1474[#] *1*	6^+	2.64 *9*	C^2S'=2.6 theory.
1557[#] *1*	8^+	3.40 *11*	C^2S'=3.4 theory.
2188[@] *1*	8^+	1.71 *3*	C^2S'=1.7 theory.
2290[@] *1*	(2^+)	0.42 *1*	C^2S'=0.5 theory.
2325[@] *1*	6^+	1.31 *3*	C^2S'=1.3 theory.
2382[@] *1*	4^+	0.90 *CA*	E(level): from ^{210}At decay (1972Ja12).
2391[@] *1*	(1^+)	0.31 *CA*	
2403[@] *1*	5^+	1.10 *CA*	E(level): from ^{210}At decay (1972Ja12).
2412[@] *1*	(3^+)	0.72 *CA*	
2439[@] *1*	7^+	1.51 *3*	C^2S'=1.5 theory.
2851[&] *1*	11^-	3.25 *6*	C^2S'=2.3 theory. S: excess strength may be attributed to the missing 3^- member; C^2S'=0.9 exp, 0.7 calc.
2872 *1*			E(level): may correspond with (d,d′) state at 2874.
2911[&] *1*	5^-	0.31 *1*	C^2S'=1.1 theory; 5^- (α,t) strength is split between 2911,3026 levels as for direct ^{210}At ε transitions.
3000[&] *1*	(9^-)	1.88 *CA*	
3017[&] *1*	(7^-)	1.53 *CA*	E(level): from ^{210}At decay (1972Ja12).
3026[&] *1*	5^-	0.78 *CA*	E(level): from ^{210}At decay (1972Ja12). Split 5^- (α,t) strength is ascribed to mixing of Configuration=((208πB5$^-$) (π 1$h_{9/2}$0)) and Configuration=(π 1$h_{9/2}$) (π 1$i_{13/2}$).
3028[&] *1*	(2^-)	0.54 *CA*	
3079[&] *1*	(4^-)	0.78 *2*	C^2S'=0.9 theory.
3125[&] *1*	(6^-)	1.34 *CA*	E(level): from ^{210}At decay (1972Ja12).
3137[&] *1*	(8^-)	1.66 *CA*	
3185[&] *1*	(10^-)	2.11 *4*	C^2S'=2.1 theory.
3792[a] *1*	(2^+)	0.35 *2*	C^2S'=0.5 theory. L=3(+6).
4027[a] *1*	(4^+)	0.60	C^2S'=0.9 theory.
4139[a] *1*	(6^+)	0.82	C^2S'=1.3 theory; 6^+, L=3 strength is split between 4139,4469 levels. L=3+1.

Continued on next page (footnotes at end of table)

^{209}Bi(α,t) E=40 MeV 1980Gr09 (continued)

^{210}Po Levels (continued)

E(level)	J$^{\pi}$ †	S ‡	Comments
4320[a] *1*	(3^+)	0.86 *4*	C^2S'=0.7 theory.
4382[a] *1*	(5^+)	1.19 *5*	C^2S'=1.1 theory.
4469[a] *1*	(6^+)	0.55 *3*	L=3+1.
4553[a] *1*	$(7^+,4^+)$	1.83 *7*	C^2S'=1.5 theory. S: excess strength may be the missing C^2S'=0.3 of 4^+ member. L=3+1.

† From Adopted Levels.

‡ To unfold composite peaks, stripping sum rules (1966Co31) are used to estimate relative C^2S' for J′s within a configuration with results shown in parentheses. Individual strengths correspond with measured totals of unresolved C^2S'(2382,2391,2403,2412 levels)=3.08 *7*, C^2S'(3000,3017,3026,3028 levels)=4.85 *8*, C^2S'(3125,3137 levels)=3.13 *5*.

Configuration=$(\pi\ 1h_{9/2})^2$; L=5 transfer with summed C^2S' normalized to 8.80.

@ Configuration=$((\pi\ 1h_{9/2})\ (\pi\ 2f_{7/2}))$; L=3 transfer with summed C^2S'=8.03 *17*.

& Configuration=$((\pi\ 1h_{9/2})\ (\pi\ 1i_{13/2}))$; L=6 transfer with summed C^2S'=14.43 *26*.

[a] Configuration=$((\pi\ 1h_{9/2})\ (\pi\ 2f_{5/2}))$; L=3 transfer with summed C^2S'=6.2 L=1 strengths are subtracted from mixed states; see (^{3}He,d).