^{209}Bi(d,p) 1972Cl05,1972Ko03

History

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

$J^\pi(^{209}Bi)=9/2^-$.
1972Cl05: ED=19 MeV, magnetic spectrograph resolution=10 keV (FWHM).
1972Ko03: ED=17 MeV, magnetic spectrograph resolution=7-9 keV (FWHM).
Others: 1960Ho07, 1960Co07, 1962Mu05, 1962Er02, 1963Mu06, 1994Go42.
Q(d,p)=2369 *10* (1964Sp12), 2373 *6* (1972Ko03), 2379.6 *14* (1977Wa08) mass adjustment.

^{210}Bi Levels

L-values are from angular distributions at 11 angles (θ=10-60) compared with ^{208}Pb(d,p) E=19 MeV shapes; see 1972Cl05. For discerning between L=6 and L=7, see (α,^{3}He).
ΔE: Uncertainty=2 keV if E<2 MeV, otherwise 3 keV.

E(level)[†]	J^π[@]	L	C^2S'[#]	Comments
0.0[&]	1^-	4	0.29	C^2S'=0.3 theory.
47[&]	0^-	4	0.11	C^2S'=0.1 theory.
272[&]	9^-	4	1.95	C^2S'=1.9 theory.
320[&]	2^-	4	0.54	C^2S'=0.5 theory.
347[&]	3^-	4	0.81	C^2S'=0.7 theory.
436[&]	5^-,7^-	4	2.7	Unresolved 7-, 433-keV and 5-, 439-keV states. Doublet C^2S'=2.6 theory.
502[&]	4^-	4	1.06	C^2S'=0.9 theory.
549[&]	6^-	4	1.34	C^2S'=1.3 theory.
582[&]	8^-	4	1.49	C^2S'=1.7 theory with missing 8^- strength in 915 level.
668[a]	10^-	6	1.84	C^2S'=2.1 theory.
915	(8^-)	4	0.31	Configuration=((π $2f_{7/2}$) (ν $2g_{9/2}$)) is dominant; L=4 transfer (1972Cl05,1972Ko03).
971		(6)	0.36	L=(6) 1972Cl05; L=2, C^2S'=0.01 (1972Ko03).
993[b]	$3^{(+)}$	7	0.78	π=+ is based on L=7 from σ(d,p)/σ(α,^{3}He). C^2S'=0.7 theory. 1972Ko03 report L=6.
1181[a]	(9^-,2^-)	6	2.5	Doublet C^2S'=2.4 theory.
1202[a] *3*	(3^-)	(6)	0.70	E(level): from 1972Cl05. Other: 1205 *2* (1972Ko03). C^2S'=0.7 theory.
1247				L=(4,2), C^2S'=0.05 (1972Ko03).
1317				E(level): others: 1315 *6* (1972Cl05), 1316 *3* (α,d).
1336[a]	5^-,7^-	6	2.3	Doublet C^2S'=2.6 theory.
1382[a]	(8^-,3^-)	(6)	2.9	E(level): doublet of 1373,1384 levels (1972Cl05). L: For doublet (1972Cl05). Doublet C^2S'=2.4 theory.
1458[a] *5*	(4^-,6^-)	6	2.5	E(level): doublet of 1458,1470 levels (1972Cl05). Doublet C^2S'=2.2 theory.
1470[b] *3*	(12^+)	6,7	3.3	E(level): from 1972Cl05. Other: 1469 *3* (α,d). C^2S' for L=7, other values: 2.5 for L=7 and 2.5 theory.
1525[b]	(4^+)	7	3.05	C^2S'=0.9 theory.
1583[c]	2^-	2	0.12	C^2S': 2^-, L=2 (d,p) strength is split between 1583,1922 states.
1705[b]	5^+	7	0.86	C^2S'=1.1 theory.
1750[b]	10^+	7	0.97	C^2S'=2.1 theory.
1775[b]	(6^+)	(7)	1.31	C^2S'=1.3 theory.

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^{209}Bi(d,p) 1972Cl05,1972Ko03 (continued)

^{210}Bi Levels (continued)

E(level)[†]	J$^{\pi}$[@]	L	C^{2}S′[#]	Comments
1801[b]	(11$^+$)	7	2.4	C^{2}S′: from 1972Ko03. Other: doublet C^{2}S′(8$^+$,11$^+$)=2.2 (1972Cl05). C^{2}S′=2.3 theory.
1812[b]	(8$^+$)		1.5	C^{2}S′: from 1972Ko03. C^{2}S′=1.7 theory.
1835[b]	(7$^+$)	(7)	2.4	C^{2}S′=1.5 theory.
1922[c]	2$^-$	2	0.32	C^{2}S′=0.5 theory.
1981[c]	(7$^-$,3$^-$)	2	2.1	E(level),L: doublet of 1975,1984 levels (1972Cl05). C^{2}S′=2.2 theory.
2033[c]	5$^-$	2	0.76	C^{2}S′=1.1 theory. L,C^{2}S′: Admixed with L=0 transfer of≈0.24 strength.
2080[c]	4$^-$	2	0.45	C^{2}S′=0.9 theory. C^{2}S′: 4$^-$, L=2 (d,p) strength is split between 2080,2176 states.
2107[c]	6$^-$	2	0.82	C^{2}S′=1.3 theory. C^{2}S′: 6$^-$, L=2 (d,p) strength is split between 2107,2236 states.
2138[c] *3*	5$^-$	2	0.14	E(level): from 1962Er02, 1972Cl05. Other: 2143 *3* (1972Ko03). L,C^{2}S′: Admixed with L=0 transfer of≈0.04 strength.
2176[c]	4$^-$	2	0.29	L,C^{2}S′: Admixed with L=0 transfer of≈0.06 strength.
2236[c]	6$^-$	2	0.41	
2280[c]		2	0.042	J$^{\pi}$=5$^-$ (1972Ko03).
2464				
2523[d]	4$^-$	0	0.71	C^{2}S′=0.9 theory. L,C^{2}S′: Admixed with L=2 transfer of≈0.08 strength.
2578[d]	5$^-$	0	0.90	C^{2}S′=1.1 theory. L,C^{2}S′: Admixed with L=2 transfer of 0.20 strength.
2611[d]	(4$^-$)	0	0.13	L,C^{2}S′: Admixed with L=2 transfer of≈0.037 strength.
2734[e]	8$^-$	4	1.32	C^{2}S′=1.7 theory.
2762[e]	3$^-$	4	0.46	C^{2}S′=0.7 theory. L,C^{2}S′: 3$^-$, L=4 (d,p) strength is split between 2762,3035 states. Admixed with L=2 transfer of≈0.16 strength.
2819[e]	1$^-$	4	0.23	C^{2}S′=0.3 theory.
2839[f]	(6$^-$)	2	0.64	C^{2}S′=1.3 theory. L,C^{2}S′: 6$^-$, L=2 (d,p) strength is split between 2839,3102 states. Admixed with L=4 transfer of≈0.53 strength.
2920[f]		2	0.063	
2964[e]	4$^-$	4	0.32	L,C^{2}S′: Admixed with L=2 transfer of≈0.15 strength.
3011[e]	2$^-$		0.45	C^{2}S′=0.5 theory.
3035[f]	(3$^-$)	2	0.34	Admixed with L=4 transfer of≈0.4 strength.
3067[e]	4$^-$	4	0.90	C^{2}S′=0.9 theory.
3102[e]	6$^-$	4	0.96	C^{2}S′=1.3 theory. L,C^{2}S′: 6$^-$, L=4 (d,p) strength is split between 2839,3102 states Admixed with L=2 transfer of 0.37 strength.
3138[f]	(5$^-$)	(2)	1.44	C^{2}S′=1.1 theory.
3180[f]	(4$^-$)	(2)	0.69	C^{2}S′=0.9 theory.
3206[e]	(5$^-$)	4	1.27	C^{2}S′=1.1 theory.
3242[e]	7$^-$	4	1.41	C^{2}S′=1.5 theory.
3299				
3330				
3399 *4*				E(level): from 1972Cl05.

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^{209}Bi(d,p) 1972Cl05,1972Ko03 (continued)

^{210}Bi Levels (continued)

† Data from 1972Ko03 except as noted; corresponding 1972Cl05 values are shifted a few keV downward.
‡ Uncertainty=2 keV if E<2 MeV, otherwise 3 keV.
# Deduced from measured cross sections relative to single-particle spectroscopic factors obtained by ^{208}Pb(d,p) 1972Cl05.
@ From L-transfer and assumed orbital (1972Cl05).
& Configuration=((π $1h_{9/2}$) (ν $2g_{9/2}$)); L=4 transfer. Exp C^2S' values of 1972Cl05, 1972Ko03 are respectively 10.6,10.2, as predicted.
a Configuration=((π $1h_{9/2}$) (ν $1i_{11/2}$)); L=6 transfer with summed C^2S'=13.1 if 1^- strength=0.3 (see 1972Cl05).
b Configuration=((π $1h_{9/2}$) (ν $1j_{15/2}$)); L=7 transfer with summed C^2S'=18.6 if missing 9^+,11^+ strength=3.7. See 1972Cl05.
c Configuration=((π $1h_{9/2}$) (ν $3d_{5/2}$)); L=2 transfer with summed C^2S'=5.7.
d Configuration=((π $1h_{9/2}$) (ν $4s_{1/2}$)); L=0 transfer with summed C^2S'=2.1.
e Configuration=((π $1h_{9/2}$) (ν $2g_{7/2}$)); L=4 transfer with summed C^2S'=8.2.
f Configuration=((π $1h_{9/2}$) (ν $3d_{3/2}$)); L=2 transfer with summed C^2S'=3.8.