

$^{210}\text{Bi}(\text{d,t})$ : target= $9^-$  isomer 1980CI05

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

Target  $^{210\text{m}}\text{Bi}$   $J^\pi=9^-$ .

1980CI05: E=17 MeV deuteron beam was produced from the Yale MP tandem accelerator. Target was 1.39 mg 99% enriched  $^{210\text{m}}\text{Bi}$  on a carbon backing. Tritons were momentum analyzed with a multigap spectrograph and detected on Ilford nuclear emulsion plates, FWHM $\approx$ 15-30. Measured  $\sigma(\theta)$ . Deduced levels, L, J-transfer, spectroscopic factors from DWBA analysis.

Other: 1960VI01.

 $^{209}\text{Bi}$  Levels

The authors of 1980CI05 suggest that the observed levels are two-particle one-hole states resulting from the coupling of the  $^{210}\text{Bi}(9^-)$  target, with dominant configuration= $\pi(1h_{9/2})^{+1}\otimes\nu(2g_{9/2})^{-1}$ , with neutron hole states in  $^{207}\text{Pb}$ . They show that the centroids and summed spectroscopic factors for the levels resulting from probable  $p_{1/2}$ ,  $p_{3/2}$ ,  $f_{5/2}$ , and  $f_{7/2}$  transfers agree well with the energies and spectroscopic factors for the corresponding single particle states found in  $^{208}\text{Pb}(\text{d,t})$ .

E(level) <sup>†</sup>	L <sup>@</sup>	C <sup>2</sup> S <sup>b</sup>	E(level) <sup>†</sup>	L <sup>@</sup>	C <sup>2</sup> S <sup>b</sup>	E(level) <sup>†</sup>	L <sup>@</sup>	C <sup>2</sup> S <sup>b</sup>	E(level) <sup>†</sup>	L <sup>@</sup>	C <sup>2</sup> S <sup>b</sup>
2741 5	1	0.14	3735 10	3 <sup>&amp;</sup>	0.94	4065 10	1 <sup>a</sup>	0.92 <sup>a</sup>	5058 10	3	0.15
2987 <sup>‡</sup>	1	0.98	3764 10	1 <sup>&amp;</sup>	0.25	4084 10	1 <sup>a</sup>	0.92 <sup>a</sup>	5256 10	3	0.32
3135 5			3818 10	3	1.58	4122 10	1 <sup>a</sup>	0.92 <sup>a</sup>	5367 10	3	0.41
3154 5	1	0.61	3912 10	1	0.71	4225 10	1	0.14	5402 10	3	0.56
3212 5	1	0.48	3960 10			4263 10	1	0.21	5464 10	3	0.83
3469 <sup>#</sup> 5	3	0.27	4002 10	1	0.35	4349 10	1	0.97	5657 10	3	0.43
3597 5	1,3	0.17,1.95	4021 10			4417 10	1	0.14	5924 10	3	0.28

<sup>†</sup> Relative to E=2987 taken as the reference level energy (1980CI05).

<sup>‡</sup> Rounded-off value from Adopted Levels.

<sup>#</sup> Authors of 1980CI05 assign level as possible doublet on the basis of their assignment of the level as a member of the configuration= $\nu(2f_{5/2})^{-1}\otimes 9^-$  multiplet, and the consequent disagreement with probable  $J^\pi=(11/2^+)$  for E=3466 deduced by 1974CI06 in (p,p'); however, in (t,2n $\gamma$ ), 1983Ma15 report a level at 3467 with  $J^\pi$  probably  $19/2^+$ , as well as one at 3464 with  $J^\pi$  probably  $11/2^+$ .

<sup>@</sup> From comparison of the experimental cross sections with DWBA predictions (1980CI05).

<sup>&</sup> L=1,3 for the 3735+3764 doublet, but larger  $\sigma$  at forward angles for the 3764 peak allows authors to assign L=1 to this component, and thus L=3 for the 3735 peak.

<sup>a</sup> L=1 and C<sup>2</sup>S=0.92 for the 4065+4084+4122 multiplet.

<sup>b</sup> Defined by  $d\sigma/d\Omega_{\text{exp}}=N\times C^2S/(2J+1)\times d\sigma/d\Omega_{\text{DWBA}}$ , with N=3.33 (1980CI05) and where J is the total angular momentum of the transferred neutron. L=1 and L=3 are taken as corresponding to  $p_{3/2}$  and  $f_{7/2}$ , respectively, except for the 2987, 3154, and 3212 levels which are taken as  $p_{1/2}$ , and the levels with L=3 below 5 MeV which are taken as  $f_{5/2}$ .