

²⁰⁷Pb(³He,d),(α,t) 1971A105

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

E(³He)=30 MeV, FWHM≈20 keV, θ=10°–70°.

E(α)=30 MeV, θ=20°,50°.

As pointed out by the authors, the ²⁰⁷Pb(³He,d) reaction is expected to populate levels with configuration=πnljν3p⁻¹J with proton particle states 1h_{9/2}, 2f_{7/2}, 1i_{13/2}, 2f_{5/2}, 3p_{3/2}, and 3p_{1/2}. The authors find that the total strength in each multiplet is close to that expected on the basis of sum rule limits.

²⁰⁸Bi Levels

E(level) [†]	L [‡]	S [#]	Comments
0.0	(5)	5.5	
65 5	(5)	4.1	
603 5	(5,3)		S: S(L=5)=0.76, S(L=3)=0.09.
631 & 5	(5,3)		S: S(L=5)=0.83, S(L=3)=0.11.
939 5	(3)	3.4	
1038 5	(3)	3.9	
1565 5	(3)	0.18 [@]	
1630 5	(6)	5.9	
1673 5	(6)	5.6	
1719 & 5	(6)	2.1	
1806 5		0.31 [@]	S: if L=3.
1885 5		0.30 [@]	S: if L=3.
2132 5		0.08 [@]	S: if L=1.
2462 5		0.17 [@]	S: if L=3.
2506 5		0.11 [@]	S: if L=3.
2890 5	(3)	3.4	
2945 5	(3)	2.8	
3070 5	(1)	0.19	
3173 5	(1)	0.76	
3260 5	(1)	0.48	
3288 5	(1)	1.68	
3410 5	(1)	0.44	
3460 5	(1)	0.32	
3535 5			S: weak.
3612 5	(1)	0.60	

[†] The authors give only one set of energies for both the ²⁰⁹Bi(d,t) and ²⁰⁷Pb(³He,d) reactions. The authors state that the uncertainty due to calibration is <5 keV. The evaluator assigns ΔE=5 keV. From a comparison with energies from (p,nγ), the authors' values show an average deviation of +3 keV. Where used In Adopted Levels, and for correlation with levels from other reactions, the above (³He,d),(α,t) values are lowered by 3 keV.

[‡] For the strong doublets, the authors adopt the same L-value As for the corresponding single-particle states In ²⁰⁹Bi populated by the ²⁰⁸Pb(³He,d) reaction. For other levels, the authors rely on a comparison of (³He,d) and (α,t) cross sections and the relative enhancement by the (α,t) reaction of high L-transfer transitions. 1971A105 quote unpublished 42-MeV (³He,d) data of R. Tickle which yield L=3 for the 603 and 631 levels and confirm L=1 with <10% L=3 for the states above 3000.

[#] Values are ((2J(F)+1)/(2J(i)+1))C²S. For each L, values are based on σ relative to that for the corresponding ²⁰⁹Bi single-particle state excited In ²⁰⁸Pb(³He,d). The authors associate L=5 transfer with a 1h_{9/2} proton-particle component, L=3 with 2f_{7/2} (E≤1038), 2f_{5/2} (E≥2890), L=6 with 1i_{13/2} and L=1 with 3p_{3/2}.

[@] For possible configuration see 1971A105.

[&] Authors suggest level is doublet based on large σ.