^{104}Pd(d,t),(^{3}He,α) 1980Sc23,2008Ro13

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

2006Ro50,2008Ro13: ^{104}Pd(d,t): E=15 MeV. Measured: σ(E(t),θ) (θ)lab: 14 different angles, no values given. Nuclear emulsion technique. Deduced: ^{103}Pd levels up to 1043 keV, L, J^π, C^2S.
1980Sc23: ^{104}Pd(d,t): E=50 MeV. Measured: σ(E(t),θ) (θ)lab=6°−22.5°. Deduced: ^{103}Pd levels, L, J^π, C^2S, deeply bound hole states, spectroscopic strength distributions. DWBA analysis enriched targets, ΔE-E solid state detector telescope, ΔE=65 keV.
1980Sc23: ^{104}Pd(^{3}He,α): E=70 MeV. Measured: σ(Eα) at (θ)lab=17, 19°. Deduced: deeply bound hole states.
Unpublished ^{104}Pd(d,t) results of 1973RiZL are considered as secondary sources by the evaluator.
Other: 1963Cu02.

^{103}Pd Levels

For spectroscopic strengths see 1980Sc23.

E(level)[@]	J^π[a]	L[&]	C^2S[b]	Comments
0.0	$5/2^+$	2	2.09	Other: C^2S=1.88 (2008Ro13).
243.8[#] *10*	$7/2^+$	4	4.28	Other: C^2S= 2.8 (2008Ro13).
267.0[#] *10*	$5/2^+$	2	0.21	Other: C^2S= 0.11 (2008Ro13).
499.0[#] *10*	$(1/2^+)$	(0+2)		E(level): Following 2008Ro13 this level is clearly a doublet. C^2S=0.16 if L=0 and $J^\pi=1/2^+$ (2008Ro13), C^2S=0.29 if L=2 and $J^\pi=3/2^+$ (2008Ro13).
532.2[#] *10*	$7/2^+$	>3		L: From (2008Ro13). Other: L=2 from 1980Sc23. No value of C^2S given by (2008Ro13).
625.4[#] *10*	$3/2^+,5/2^+$	2	0.38,0.29	E(level): other: 610 *15* (1980Sc23). C^2S=0.36 if L=2 and $J^\pi=3/2^+$ (2008Ro13), C^2S=0.29 if L=2 and $J^\pi=5/2^+$ (2008Ro13).
699.1[#] *10*	$5/2^+$	2	0.61	E(level): other: 700 *15* (1980Sc23). Other C^2S= 0.41 (2008Ro13).
727.8[#] *10*	$1/2^+$	0	0.16	L: From 2008Ro13. C^2S from 2008Ro13.
785.6[#] *10*	$11/2^-$	5	0.62	L: From 2008Ro13. C^2S from 2008Ro13.
815? *2*	$3/2^+,5/2^+$	2	0.16,0.13	E(level): other: 800 *15* (1980Sc23). E(level): Not observed by 2008Ro13 although the energy resolution was much better.
884.4[#] *10*	$3/2^+,5/2^+$	(2)		L: From 2008Ro13. C^2S=0.052 if L=2 and $J^\pi=3/2^+$ (2008Ro13), C^2S=0.042 if L=2 and $J^\pi=5/2^+$ (2008Ro13).
905? *2*		0,(2)		E(level): Considered as tentative by the evaluator. Observed only by 1973RiZL. Cannot be identical with $11/2^+$ state seen in (HI,xn) and (p,nγ). Also not observed by 2008Ro13.
913.9[#] *10*	$3/2^-,5/2^-,7/2^-$	(3)		L: From 2008Ro13. C^2S=0.054 or 0.039 from 2008Ro13. J value not given.
1043.8 *10*	$3/2^+,5/2^+$	2	0.24,0.20	E(level): other: 1030 *15* (1980Sc23). C^2S=0.15 if L=2 and $J^\pi=3/2^+$ (2008Ro13), C^2S=0.12 if L=2 and $J^\pi=5/2^+$ (2008Ro13).
1067[†] *2*	$(3/2^+,5/2^+)$	2,(0)		L: L=(0) is ruled out if excitation corresponds with 1069-keV level in ^{103}Ag ε +β^+ decay and (p,nγ).
1170[‡] *15*	$(5/2)^+$	2	0.16	E(level): probably corresponds with 1182-keV level observed in ^{103}Ag ε +β^+ decay and (p,nγ).
1194?[†] *2*		2,(0)		E(level): observed only by 1973RiZL. Considered as tentative by the evaluator.
1271[†] *2*	$(5/2)^+$	2,(0)	0.09	L=(0) is ruled out if excit corresponds with 1274-keV level observed in ^{103}Ag ε +β^+ decay and ^{103}Rh(p,nγ).
1280[‡] *15*	$(11/2)^-$	5	0.40	
1301?[†]		2,(0)		E(level): observed only by 1973RiZL. Considered as tentative by the evaluator.
1570 *15*	$3/2^+,5/2^+$	2	0.20,0.16	E(level): probably corresponds to 1581-keV level observed in ^{103}Ag ε+β^+

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^{104}Pd(d,t),(^{3}He,α) 1980Sc23,2008Ro13 (continued)

^{103}Pd Levels (continued)

E(level)[@]	J$^{\pi}$[a]	L[&]	C^{2}S[b]	Comments
				decay.
1595[†] *2*		0,(1)	0.29,0.21	E(level): could correspond to 1592-keV level observed in ^{103}Ag $\varepsilon+\beta^+$ decay.
1641 *2*	1/2$^+$	0	0.08	L: 1973RiZL give L=(2).
1676[†] *2*		0,(2)		
1750[‡] *15*	3/2$^+$,5/2$^+$	2	0.08,0.07	
1807?[†] *2*		1,(4)		E(level): observed only by 1973RiZL. Considered as tentative by the evaluator.
1820 *15*	1/2$^+$	0	0.07	If identical with 1807-keV level observed by 1973RiZL the L assignments disagree.
1857?[†] *2*		(2,0)		E(level): observed only by 1973RiZL, considered by the evaluator as tentative.
1872?[†] *2*		(0,2)		E(level): observed only by 1973RiZL, considered by the evaluator as tentative.
1900[‡] *15*	1/2$^-$,3/2$^-$	1	0.10,0.08	
1943?[†] *10*		2		E(level): observed only by 1973RiZL, considered as tentative by the evaluator.
1960[‡] *15*		2	0.11,0.09	E(level): may be identical with 1943-keV excitation observed by 1973RiZL could be an unresolved doublet as in ^{103}Ag ε decay two states at 1953 and 1964 keV, respectively, are observed.
2100[‡] *15*	1/2$^-$,3/2$^-$	1	0.19,0.17	
2180[‡] *15*	1/2$^-$,3/2$^-$	1	0.08,0.07	
2280[‡] *15*	7/2$^+$,9/2$^+$	4	0.60,0.30	
2480[‡] *15*	7/2$^+$,9/2$^+$	4	0.82,0.42	
2600[‡] *15*	7/2$^+$,9/2$^+$	4	2.26,1.14	
2660[‡] *15*	7/2$^+$,9/2$^+$	4	1.51,0.75	
2760[‡] *15*	1/2$^-$,3/2$^-$	1	0.24,0.22	
2880[‡] *15*	1/2$^-$,3/2$^-$	1	0.26,0.24	

[†] Not observed by 1980Sc23.
[‡] Not observed by 1973RiZL.
[#] From 2008Ro13. No levels with an excitation energy above 1043 keV were analyzed by these authors.
[@] Level energies with $\Delta E\approx 2$ keV taken from 1973RiZL, level energies with $\Delta E\approx 15$ keV taken from 1980Sc23.
[&] From comparison of measured angular distributions with DWBA calc 1980Sc23, unless noted otherwise.
[a] From Adopted Levels.
[b] C^{2}S from 1980Sc23 for adopted J^{π} values, unless noted otherwise. Deduced from: $d\sigma/d\Omega(exp)=NC^2S\ d\sigma/d\Omega(DWBA)/(2J+1)$ with N=3.33.