^{152}Sm(pol t,α), ^{152}Sm(t,α) 1979St06,1972Bu22,1990Zy01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

E(t)=17 MeV for (pol t,α) (1979St06), E(t)=15 MeV for (t,α) (1972Bu22).
Vector polarization in 1979St06=0.80. FWHM=18 keV (1979St06).
Metallic targets 150 μg/cm^2 (98.29% ^{152}Sm) (pol t,α) and 70 μg/cm^2 (99.18% ^{152}Sm) (t,α).
σ(θ) measured at 2 angles in (t,α) and 6-8 angles in (pol t,α). Measured uncertainties in absolute cross sections are 20%. Reproducibility of repeated measurements is 5%.
1990Zy01: (t,α) E=35.32 MeV. Measured σ(θ) (10° to 36° in c.m. system). FWHM=80-100 keV. Absolute cross sections accurate to 5%. Six groups of states are studied in this work and the strength distributions are deduced for deep hole states.

Data for deep-proton hole states from (t,α) (1990Zy01)

Group #	energy range	L(t,α)	dσ/dΩ (μb/sr)	NSF	orbitals or levels
1	0.0-230	4	1105	1.13	0,85,117,175,197
2	230-480	5+2	2588	0.26,1.18	3/2[411]+5/2[532] 325, 345 levels
3	480-800	4,5	2069		3/2[541]+1/2[550] +3/2[422]
4	800-1200	4,(5)	1369	0.63	9/2[404]
5	1200-1800	4,(5)	1093	0.57	9/2[404]
6	1800-10000 (bump)	4	11500	≈ 5.0	7/2[413]+5/2[422] +3/2[431]+1/2[440] +1/2[431]

NSF=nuclear structure factor

^{151}Pm Levels

E(level)[#]	Jπ[@]	L[‡]	S[†]
≈0	5/2+	2	0.030
85.1[d]	7/2+	4	0.75
119[a] *4*	5/2−	3	0.007
176 *2*	7/2−	3	0.063
198 *2*	9/2+	4	0.054
260[c] *2*	(9/2−)	5	0.12
324 *2*	5/2+	2	0.50
345 *2*	11/2−	5	1.66
427 *2*	1/2+	0	0.11
508 *2*	5/2+	2	0.20
530 *2*	(7/2−)	3	0.17
549 *2*			
576[&] *3*			
595 *2*			
641 *3*	11/2−	5	0.60
699 *3*			
719[b] *3*	7/2+	4	0.16
782 *2*	7/2+	4	0.18
810 *3*			
849 *2*	1/2+	0	0.026
874[b] *3*	3/2+	2	0.15
915[b] *3*	5/2+	2	0.046
943 *3*	(7/2+)	4	0.25
960 *3*	(5/2+)	2	0.03
999 *3*	(5/2+)	2	0.071
1037 *3*	(7/2+)	4	0.08
1078[a] *4*	(3/2+)	(2)	0.023
1102 *3*	(3/2+)	(2)	0.037
1135 *3*	(5/2+)	(2)	0.026
1180[&] *3*			
1200[&] *3*			
1226[&] *3*			
1245 *3*			
1269[&] *3*			
1332 *3*	(5/2+)	(2)	0.078
1388[a] *4*			0.012
1424[a] *4*			
1448[&] *3*			
1464 *3*			
1494[a] *4*			0.021
1555 *3*			0.021
1570[a] *4*			
1591[a] *4*			
1622 *3*			
1758 *3*			
1935 *3*			
1980[a] *4*			
2088[a] *4*			
2115[a] *4*			
2447[a] *4*			

[†] σ(exp)/2N×σ(theory) with N=23. σ(theory) from DWBA for assigned J. Due to ambiguities in the choice of optical model parameters, uncertainties may be 30-50%.

Continued on next page (footnotes at end of table)

^{152}Sm(pol t,α), ^{152}Sm(t,α) 1979St06,1972Bu22,1990Zy01 (continued)

^{151}Pm Levels (continued)

‡ From $\sigma(\theta)$ of 1979St06. 1972Bu22 obtain L values from $\sigma(^3He,d)/\sigma(t,\alpha)$ ratios.

From the higher resolution (t,α) work (1972Bu22), relative to 85.1-keV level (energy from other work). From mean of 1972Bu22 (ΔE=1-2 keV for strongly populated levels) and 1979St06 ($\Delta E \leq 4$ keV for strongly populated levels) for weakly populated states.

@ From analyzing powers in (pol t,α).

& From 1972Bu22, not reported by 1979St06.

[a] From 1979St06, not reported by 1972Bu22.

[b] 1972Bu22 suggest this may be an unresolved doublet.

[c] Unresolved from 255 L=2 level which is strongly populated in (^{3}He,d).

[d] From other (γ-ray) studies.