^{76}Ge(p,p'),(pol p,p')　　　1983Ra32

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

1983Ra32 (also 1987Ja05,1986Ro08): (p,p'),E=22 MeV. Split-pole magnetic spectrometer. FWHM=10 keV. The $\sigma(\theta)$ data from 10° to 100° in steps of 5°. Uncertainties in cross sections ≈15%. Coupled-channel and DWBA calculations in the framework of vibrational model and asymmetric rotor model. Both calculations agree well for g.s., first 2^+, and first 3^- states. DWBA fails for second 2^+, first 4^+, and second 0^+ states.

Others:

1993Mo05 (also thesis by 1986MoZR): (pol p,p'),E=22.3 MeV. Measured $\sigma(\theta)$ and $A_y(\theta)$, coupled-channel calculations using IBA-2 model. Deduced optical-model and deformation parameters. Data given for g.s., first 2^+, 3^-, 4^+ and second 2^+ states.

1992Ke07: analysis of (p,p') data for first 2^+ and 3^- states.

1985Se05: (pol p,p'),E=11.5 MeV; $\sigma(\theta)$ and vector analyzing power (VAP) data for first 0^+ and 2^+ states.

1984Ba71: analysis of (p,p'),E=14.5 MeV data of 1970Cu03, using coupled-channel formalism and IBA model, deformation parameters deduced for first 2^+, 4^+ and second 0^+ and 2^+ states.

1970Cu03: (p,p'),E=14.5 MeV, $\sigma(\theta)$ from 20° to 150° in steps of 10°. Data analyzed by coupled channel calculations.

1970Pe09: (p,p'),E=11 MeV. Measured $\sigma(\theta)$.

1967Br10: (p,p'),E=11.5 MeV. Measured $\sigma(\theta)$.

1964Da21: (p,p'),E=12 MeV. Measured $\sigma(\theta)$.

Reduced transition probabilities are given under comments as G_L(isoscalar) (W.u.) values, where G_L(isoscalar)= $(Z/\alpha)^2\beta_L$(isoscalar)/β_L(single particle).

^{76}Ge Levels

E(level)‡	$J^{\pi\dagger}$	L$^{@}$	Comments
0	0^+	$0^{\&}$	
562 5	2^+	2	β_2=0.260 18 (1986Ro08,1983Ra32,rotational and vibrational models). Others: β_2=0.250 18 (1987Ja05,1983Ra32,DWBA); 0.250 19 (1992Ke07); 0.211 10 (1985Se05); 0.22 (1970Cu03); 0.26 (1970Pe09); 0.25 1 (1993Mo05, 1986MoZR) (vibrational and rotational models). Deformation lengths (β_2R) are also given by 1987Ja05, 1993Mo05 (and 1986MoZR). G_2(W.u.)=25.5 40 (1992Ke07).
1107 5	2^+	(2)	β_2=0.075 (DWBA), 0.085 (coupled-channel,vibrational model). Other: β_2=0.067 4, 0.073 2 (1986MoZR,vibrational model); 0.032 (1970Cu03).
1406 5	4^+	(4)	β_4=0.07 (DWBA), 0.020 (coupled-channel,vibrational and rotational models). Others: β_4=0.064 11, 0.024 6 (1986MoZR, vibrational model); 0.001 (1993Mo05,symmetric rotor model), 0.020 (1986MoZR); 0.0 (1970Cu03).
1538 5			
1912 5		$0^{\&}$	
2022 5		$(4)^{\&}$	
2286	$(3)^-$	$3^{\&}$	E(level): reported only by 1970Cu03.
2456 5			
2504 5	2^+	2	
2554?^{b} 5			
2624?^{b} 5			
2693 5	3^-	3	β_3=0.140 10 (DWBA,1983Ra32,1987Ja05); 0.150 11 (coupled-channel, 1983Ra32,1986Ro08,1987Ja05,vibrational model). Others: β_2=0.150 12 (1992Ke07); 0.14 (1970Cu03); 0.13 (1970Pe09); 0.15 1 (1993Mo05,1986MoZR,vibrational model). G_3(W.u.)=9.4 14 (1992Ke07).
2734 5	4^+	4	
2748 5			
2768 5	2^+	2	
2843 5	2^+	2	
2900 5			
2921 5		3	

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^{76}**Ge(p,p′),(pol p,p′)**　　**1983Ra32 (continued)**

^{76}Ge Levels (continued)

E(level)[‡]	J$^\pi$[†]	L[@]	Comments
2959 *5*		3[&]	
2993 *5*	4$^+$	4	
3035 *5*			
3051 *5*			
3071 *5*			
3090? *5*			
3135 *5*			
3150 *5*	(2)$^+$	2	
3166 *5*			
3195[a] *5*	(2)$^+$&(4,5,6)$^{-}$[#]	2+5	L: 1970Cu03 give L=3.
3224 *5*			
3240 *5*	4$^+$	4	
3268 *5*	(4$^-$,5$^-$,6$^-$)[#]	(5)	
3317[a] *5*	0$^+$&(3)$^{-}$[#]	0+3	
3349 *5*			
3390 *5*	(4,5,6)$^{-}$[#]	5	
3402 *5*			
3439 *5*			
3453 *5*	(3$^+$,4$^+$,5$^+$)[#]	4	
3485 *5*	3$^-$	(3)	
3506 *5*			L: 1970Cu03 give L=2 for a level at 3498 which corresponds to 3506 or 3485 level.
3533 *5*			
3545 *5*			
3585 *5*	(2)$^+$	2	
3606 *5*			
3640 *5*	(4$^-$,5$^-$,6$^-$)	5	
3658 *5*			
3691 *5*			
3724 *5*	(5)$^-$	5	
3750 *5*			
3788 *5*			
3805 *5*			
3815 *5*			
3848 *5*			
3868 *5*			
3883 *5*			
3904 *5*	(2,3,4)$^{-}$[#]	3	
3972 *5*	(3$^+$,4$^+$,5$^+$)[#]	(4)	
3997 *5*	(3,4,5)$^{+}$[#]	4	
4026? *5*			
4057? *5*			
4073 *5*			
4099 *5*	(4,5,6)$^{-}$[#]	5	
4121 *5*			
4153 *5*	(3,4,5)$^{+}$[#]	4	
4189 *5*			
4209 *5*	(2,3,4)$^{-}$[#]	3	
4235 *5*			
4249 *5*			
4272 *5*			
4325 *5*			
4364 *5*	(3,4,5)$^{+}$[#]	4	

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^{76}Ge(p,p′),(pol p,p′)   **1983Ra32** (continued)

^{76}Ge Levels (continued)

E(level)‡	J$^{\pi}$†	L@	E(level)‡	E(level)‡	J$^{\pi}$†	L@
4399 *5*	(3,4,5)$^{+}$#	4	4570 *10*	4808 *10*		
4426 *10*			4611 *10*	4839 *10*	(3^{+},4^{+},5^{+})#	(4)
4444 *10*	(3^{+},4^{+},5^{+})#	(4)	4659 *10*	4868 *10*		
4468 *10*			4698 *10*	4939 *10*		
4488 *10*			4736 *10*	5276 *10*		
4536 *10*	(3,4,5)$^{+}$#	4	4767 *10*			

† From the Adopted Levels, unless otherwise stated.
‡ From 1983Ra02, unless otherwise stated. Above 3700, values may be systematically higher as the comparison with similar levels
  populated in (α,α') shows. The deviation is from ≈10 keV (at 3750 keV) to ≈45 keV (4615 keV).
From L(p,p′). For higher (>3 MeV) excitations J=L−1, L, L+1.
@ From 1983Ra32 unless otherwise stated.
& From 1970Cu03.
^{a} Mixed L-transfer indicates a doublet.
^{b} Contaminated by impurities.