

$^{69}\text{Ga}(\text{d,p})$ 1975Do02,1973Yn01

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan		NDS 136, 1 (2016)	1-Jul-2016

Target: $J^\pi=3/2^-$.1975Do02: E(d)=10 MeV. Measured $\sigma(\theta)$ for $\theta=10^\circ$ to 90° (5° steps up to 50° and 10° steps beyond) using Enge split-pole magnetic spectrograph and photographic emulsions (FWHM=7-11 keV); DWBA analysis.1973Yn01: E(d)=12 MeV. Measured $\sigma(\theta)$ for $\theta=10^\circ$ to 135° using split-pole spectrograph and photographic emulsions (FWHM \approx 18 keV); DWBA analysis.

Others: 1971Ar12, 1970Sa22.

 ^{70}Ga Levels

E(level) [†]	L [‡]	(1/4)(2J+1)S [#]	Comments
0.0	1	0.34	$d\sigma/d\Omega_{\text{max}}=1.7$ mb/sr (1973Yn01). (1/4)(2J+1)S: other: 0.38 (1973Yn01).
508 1	1	0.57	$d\sigma/d\Omega_{\text{max}}=2.4$ mb/sr (1973Yn01). E(level): others: 510 3 (1973Yn01), 506 6 (1971Ar12). (1/4)(2J+1)S: other: 0.52 (1973Yn01).
651 1	1+3	0.10+0.15	$d\sigma/d\Omega_{\text{max}}=0.54$ mb/sr (1973Yn01). E(level): others: 653 3 (1973Yn01), 651 3 (1971Ar12). L,(1/4)(2J+1)S: other: L=1, 1/4(2J+1)S=0.13 (1973Yn01).
691 2			E(level): other: 689 3 (1971Ar12).
878 3	2+4	0.07+1.60	$d\sigma/d\Omega_{\text{max}}=0.45$ mb/sr (1973Yn01). E(level): others: 881 3 (1973Yn01), 875 5 (1971Ar12). L,(1/4)(2J+1)S: other: L=4, 1/4(2J+1)S=1.4 (1973Yn01).
902 1	3	0.41	$d\sigma/d\Omega_{\text{max}}=0.225$ mb/sr (1973Yn01). E(level): others: 904 3 (1973Yn01), 895 8 (1971Ar12). (1/4)(2J+1)S: other: 0.7 (1973Yn01).
996 2	1+3	0.09+0.05	E(level): other: 995 3 (1971Ar12).
1010 2	1+3	0.07+0.19	(1/4)(2J+1)S: summed value for levels at 1010, 1015 and 1023.
1015 3	1+3	0.07+0.19	(1/4)(2J+1)S: summed value for levels at 1010, 1015 and 1023.
1023 3	1+3	0.07+0.19	(1/4)(2J+1)S: summed value for levels at 1010, 1015 and 1023.
1033 2	4	4.14	$d\sigma/d\Omega_{\text{max}}=0.9$ mb/sr (1973Yn01). E(level): others: 1035 3 (1973Yn01), 1030 6 (1971Ar12). (1/4)(2J+1)S: other: 2.7 (1973Yn01).
1099 4	2+4	0.05+0.57	$d\sigma/d\Omega_{\text{max}}=0.225$ mb/sr (1973Yn01). E(level): others: 1103 3 (1973Yn01), 1098 5 (1971Ar12). (1/4)(2J+1)S: other: 0.13+0.6 (1973Yn01).
1136 4			
1204 4			
1235 4	4	2.45	$d\sigma/d\Omega_{\text{max}}=0.6$ mb/sr (1973Yn01). E(level): others: 1237 3 (1973Yn01), 1230 6 (1971Ar12). (1/4)(2J+1)S: other: 1.9 (1973Yn01).
1246 4			
1254 3	2+4	0.13+0.54	$d\sigma/d\Omega_{\text{max}}=0.63$ mb/sr (1973Yn01). E(level): others: 1256 3 (1973Yn01), 1252 10 (1971Ar12). L,(1/4)(2J+1)S: other: L=1, 1/4(2J+1)S=0.15 (1973Yn01). Note that L=1 is not consistent with Adopted J^π of this level.
1262 4			
1305 4	(2)	0.1	L: from 1973Yn01. Not consistent with L(d,t)=1 and Adopted $\pi=+$. E(level): others: 1308 3 (1973Yn01), 1302 8 (1971Ar12).
1313 4			
1325 3	2	0.06	E(level): other: 1320 10 (1971Ar12). A 1330 keV 3 level observed by 1973Yn01 could correspond to this or the 1336-keV level.
1336 3	2	0.05	E(level): other: 1335 6 (1971Ar12).
1359 3	1+3	0.02+0.03	E(level): other: 1355 8 (1971Ar12).

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$^{69}\text{Ga}(\text{d,p})$ 1975Do02,1973Yn01 (continued) ^{70}Ga Levels (continued)

<u>E(level)[†]</u>	<u>L[‡]</u>	<u>(1/4)(2J+1)S[#]</u>	<u>Comments</u>
1444 3	1+3	0.02+0.04	E(level): other: 1445 10 (1971Ar12).
1456 4	1+3	0.05+0.06	$d\sigma/d\Omega_{\text{max}}=0.36$ mb/sr (1973Yn01). E(level): others: 1454 3 (1973Yn01), 1457 10 (1971Ar12). L,(1/4)(2J+1)S: other: L=1, 1/4(2J+1)S=0.08 (1973Yn01).
1502 4			
1518 4	1+3	0.01+0.03	
1534 3	1	0.07	L,(1/4)(2J+1)S: from 1973Yn01. $d\sigma/d\Omega_{\text{max}}=0.33$ mb/sr (1973Yn01). E(level): others: 1537 3 (1973Yn01), 1534 10 (1971Ar12).
1555 3	1+3	0.11+0.08	$d\sigma/d\Omega_{\text{max}}=0.72$ mb/sr (1973Yn01). E(level): others: 1558 3 (1973Yn01), 1550 8 (1971Ar12). L,(1/4)(2J+1)S: other: L=1, 1/4(2J+1)S=0.16 (1973Yn01).
1622 2	2	0.21	$d\sigma/d\Omega_{\text{max}}=0.63$ mb/sr (1973Yn01). E(level): others: 1627 3 (1973Yn01), 1620 6 (1971Ar12). (1/4)(2J+1)S: other: 0.16 (1973Yn01).
1646 2	2+4	0.04+0.32	
1661 2	4	0.68	E(level): others: 1662 3 (1973Yn01), 1656 8 (1971Ar12). L: tentatively assigned as (2) in 1973Yn01.
1687 3	4	0.79	$d\sigma/d\Omega_{\text{max}}=0.17$ mb/sr (1973Yn01). E(level): others: 1689 3 (1973Yn01), 1679 10 (1971Ar12). (1/4)(2J+1)S: other: 0.5 (1973Yn01).
1720 3	1+3	0.03+0.06	
1734 3	2	0.15	E(level): L=1 in (d,t) for E=1734 indicates a doublet. $d\sigma/d\Omega_{\text{max}}=0.45$ mb/sr (1973Yn01). E(level): others: 1735 3 (1973Yn01), 1730 6 (1971Ar12). (1/4)(2J+1)S: other: 0.11 (1973Yn01).
1796 3	1+3	0.01+0.02	
1807 4			
1822 2	2+4	0.04+0.17	E(level): L=1 in (d,t) for E=1822 indicates a doublet. $d\sigma/d\Omega_{\text{max}}=0.15$ mb/sr (1973Yn01). E(level): other: 1824 3 (1973Yn01). L,(1/4)(2J+1)S: other: L=2, 1/4(2J+1)S=0.03 (1973Yn01).
1864 3			
1877 3			
1914 2	0	0.08	E(level): other: 1917 3 (1973Yn01).
1931 4			
1968 3			
1982 4			
2015 2	2	0.21	$d\sigma/d\Omega_{\text{max}}=0.5$ mb/sr (1973Yn01). E(level): other: 2019 3 (1973Yn01). (1/4)(2J+1)S: other: 0.12 (1973Yn01).
2100@ 3	1@	0.06@	$d\sigma/d\Omega_{\text{max}}=0.27$ mb/sr (1973Yn01).
2148@ 3	2@	0.08@	$d\sigma/d\Omega_{\text{max}}=0.36$ mb/sr (1973Yn01).
2234@ 3			
2300@ 3	1@	0.03@	$d\sigma/d\Omega_{\text{max}}=0.16$ mb/sr (1973Yn01).
2446@ 3	2@	0.14@	$d\sigma/d\Omega_{\text{max}}=0.59$ mb/sr (1973Yn01).
2524@ 3	2@	0.07@	$d\sigma/d\Omega_{\text{max}}=0.32$ mb/sr (1973Yn01).
2574@ 3	2@	0.15@	$d\sigma/d\Omega_{\text{max}}=0.68$ mb/sr (1973Yn01).
2650@ 3	2@	0.11@	$d\sigma/d\Omega_{\text{max}}=0.5$ mb/sr (1973Yn01).

† From 1975Do02, except where noted.

‡ From DWBA analysis of $\sigma(\theta)$ in 1975Do02, except where noted.

$^{69}\text{Ga}(\text{d,p})$ [1975Do02](#),[1973Yn01](#) (continued)

^{70}Ga Levels (continued)

From [1975Do02](#), except where noted. Defined as $(\text{d}\sigma/\text{d}\Omega)_{\text{exp}}=(1/4)(2J+1)S(\text{d}\sigma/\text{d}\Omega)_{\text{DWBA}}$.

@ From [1973Yn01](#).