

$^{40}\text{Ca}(\text{p,p}),(\text{p,p}')\text{:res}$ [1980Wa11](#),[1975Ko13](#),[1974Mi16](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan		NDS 133, 1 (2016)	30-Sep-2015

Other main references: [1974Wi09](#), [1974Ve11](#), [1974Tr06](#), [1973Ta26](#), [1972KI03](#), [1971KI03](#), [1970Ma16](#), [1969Ma08](#), [1970Lo18](#).
Most references deal with (p,p) data. The following also have (p,p') data: [1970Ma16](#), [1970Wh06](#), [1973Ta26](#), [1974Mi16](#), [1973Ta26](#), [1980Al13](#), [1980Wa11](#), [1982Wa12](#).
[1982Wa12](#),[1980Wa11](#): E=5.9-6.5 MeV. Measured $\sigma(\theta)$, $\text{pol}(\theta)$ using pairs of symmetrically located surface barrier detectors.
[1975Ko13](#): E=2.35-4.85 MeV. Measured $\sigma(E,\theta)$ using four surface barrier detectors.
[1974Mi16](#) (also [1974MiYW](#)): E=4.8-8.2 MeV. Measured $\sigma(E,\theta)$ using silicon surface barrier detectors.
[1974Wi09](#): E=1.8-2.9 MeV. Measured σ using surface barrier detectors.
[1974Ve11](#): E=1.2-4.4 MeV, Measured $\sigma(\theta)$.
[1974Tr06](#): E=4.97 MeV, polarized protons. Measured σ , Ay for 5941-keV level.
[1973Ta26](#): E=7-11 MeV, Measured $\sigma(E)$ for inelastic scattering to the 5.613 MeV, 4^- state of ^{40}Ca from measurements of the associated gamma decay with a Ge(Li) detector. Also measured $\sigma(\theta)$ using a magnetic spectrometer.
[1972KI03](#): E=2.3-2.8 MeV, polarized protons. Measured proton polarization, deduced J^π of 3465, 3480, 3732 and 3774 keV levels.
[1971KI03](#): E=2.68-2.76 MeV. Measured polarization.
[1970Ma16](#),[1969Ma08](#): E=4.8-6.2. Measured σ using three 1 mm thick silicon surface barrier detectors.
[1970Lo18](#): E=2.3-2.8. Measured σ .

 ^{41}Sc Levels

For inelastic proton scattering data given under comments, the following nomenclature is used for A_2 , A_4 , L-values, spins and partial widths:

$A_2(1)$, $A_4(1)$, L(1), J(1) and $\Gamma(1)$ for scattering to 3352, 0^+ state in ^{40}Ca .

$A_2(2)$, $A_4(2)$, L(2), J(2) and $\Gamma(2)$ for scattering to 3737, 3^- state in ^{40}Ca .

$A_2(3)$, $A_4(3)$, L(3), J(3) and $\Gamma(3)$ for scattering to 3904, 2^+ state in ^{40}Ca .

$A_2(4)$, $A_4(4)$, L(4), J(4) and $\Gamma(4)$ for scattering to 4491, 5^- state in ^{40}Ca .

$A_2(5)$, $A_4(5)$, L(5), J(5) and $\Gamma(5)$ for scattering to 5613, 4^- state in ^{40}Ca .

[1970Wh06](#) give graphs for scattering to first three excited states in ^{40}Ca for $E(\text{p})=5810$ -6570.

(p,p') and (pol p,p') data are given for inelastic scattering to 3352, 3737, and 3904 states, with $E(\text{p})=6010$ -6550, from

[1982Wa12](#) and [1980Wa11](#), and to 3737 with $E(\text{p})=6000$ -6500, from [1980Al13](#).

E(level) [†]	J ^π #	Γ @	E(p)(lab) [‡]	Comments
3416 3	1/2 ⁺	1.80 keV 18	2390	Γ : other: 1.0 keV 3 (1975Ko13).
3465 4	1/2 ⁻	50 keV 20	2440	Γ : from 1972KI03 . Other: 60 keV 6 for $E(\text{p})(\text{lab})=2446$ keV 5 (1974Wi09), 80 keV 20 for $E(\text{p})(\text{lab})=2455$ keV 5 (1975Ko13).
3480 5	1/2 ⁻	12.0 keV 15	2445	Γ : from 1972KI03 . Other: 60 keV 6 for $E(\text{p})(\text{lab})=2446$ keV 5 (1974Wi09), 80 keV 20 for $E(\text{p})(\text{lab})=2455$ keV 5 (1975Ko13).
3732 3	1/2 ⁻	12.0 keV 12	2714	Γ : other: 12 keV 2 (1975Ko13).
3774 3	3/2 ⁻	0.70 keV 7	2757	J^π : from 1975Ko13 , 1974Wi09 . Other: 1/2 ⁻ in 1970Lo18 , 1972KI03 . Γ : other: 0.4 keV 1 (1975Ko13).
3787 5	3/2 ⁺ , 5/2 ⁺	0.20 keV 2	2770	Γ : for J=3/2; 0.30 keV 2 for J=5/2 (1974Wi09).
3969 5	1/2 ⁺	4 keV	2957	Γ : quoted by 1974Wi09 from a thesis by Brown.
4502 4	3/2 ⁺	1.0 keV 2	3503	
4535 4	3/2 ⁻	12 keV 3	3537	
4644 4	1/2 ⁻	36 keV 10	3649	
4777 4	3/2 ⁺	3 keV 1	3785	
4867 4	5/2 ⁺	2.0 keV 5	3877	
4947 4	5/2 ⁺	1.0 keV 2	3959	
4949 4	5/2 ⁻	2.0 keV 4	3961	
5023 4	1/2 ⁺	6 keV 2	4037	
5039 4	7/2 ⁺ , 9/2 ⁺	0.4 keV 1	4053	J^π : (9/2 ⁺) in 1975Ko13 .

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$^{40}\text{Ca}(\text{p,p}),(\text{p,p}'\gamma):\text{res}$ **1980Wa11,1975Ko13,1974Mi16 (continued)** ^{41}Sc Levels (continued)

E(level) [†]	J ^π #	Γ [@]	E(p)(lab) [‡]	Comments
5074 4	1/2 ⁻	3 keV 1	4089	
5084 4	3/2 ⁺	0.7 keV 2	4100	
5143 4	3/2 ⁻	3 keV 1	4160	
5356 5	3/2 ⁺	3 keV 1	4378	
5374 4	5/2 ⁺	7 keV 2	4397	
5396 5	3/2 ⁻	4 keV 1	4419	
5419 5	5/2 ⁺	18 keV 5	4443	
5490 5	1/2 ⁻	12 keV 4	4516	
5493 5	1/2 ⁺	1.0 keV 2	4519	
5520 5	5/2 ⁻	0.5 keV 2	4547	
5534 5	3/2 ⁻	20 keV 5	4561	
5576 5	3/2 ⁺ ,5/2 ⁺	6 keV 2	4604	J ^π : (3/2 ⁺) in 1975Ko13.
5649 5	5/2 ⁻	3 keV 1	4679	
5690 5	1/2 ⁻	1.0 keV 3	4721	
5704 5	1/2 ⁻	12 keV 4	4735	
5708 5	5/2 ⁻	12 keV 4	4739	
5755 5	3/2 ⁻	7 keV 3	4788	
5836 5	3/2 ⁺ ,5/2 ⁺	8.7 keV	4871	
5867 4	5/2 ⁺	12.3 keV	4902	J ^π : from 1974Tr06. Other: (5/2,7/2) ⁻ in 1970Ma16.
5941 5	3/2 ⁺		4978	J ^π ,E(p)(lab): from 1974Tr06.
5971 5	5/2 ⁻ ,7/2 ⁻	6.6 keV	5009	
5986 5	3/2 ⁻	8.7 keV	5024	A ₂ (1)=+0.84 7, A ₄ (1)=-0.10 7, L(1)=1, J(1)=3/2, Γ(1)=0.30 keV (1970Ma16).
6013 5	1/2 ⁺	26.7 keV	5052	
6047 5	3/2 ⁻	12.1 keV	5087	A ₂ (1)=+0.65 3, A ₄ (1)=-0.06 4, L(1)=1, J(1)=3/2, Γ(1)=0.72 (1970Ma16).
6085 & 5			5126 &	
6131 5	3/2 ⁺ ,5/2 ⁺	2.9 keV	5173	
6147 5	5/2 ⁺	2.9 keV	5189	A ₂ (2)=-0.28 4, A ₄ (2)=0.00 7, L(2)=1, Γ(2)=0.37 (1970Ma16).
6203 5	3/2 ⁻	6.5 keV	5247	A ₂ (1)=+0.80 8, A ₄ (1)=-0.11 11, L(1)=1, J(1)=3/2, Γ(1)=0.12 (1970Ma16).
6236 5	5/2 ⁻ ,7/2 ⁻	8.3 keV	5281	
6259 & 5			5304 &	
6314 & 5			5361 &	
6326 & 5			5373 &	
6335 5	1/2 ⁺	27.9 keV	5382	L(1)=0, J(1)=1/2 (1970Ma16).
6361 5	5/2 ⁺	2.8 keV	5409	A ₂ (1)=-0.06 4, A ₄ (1)=+0.82 4, L(1)=2, J(1)=5/2, Γ(1)=1.7 (1970Ma16).
				A ₂ (3)=+0.10 5, A ₄ (3)=-0.07 7, L(3)=0, J(3)=1/2, Γ(3)=0.86 (1970Ma16).
6399 5	3/2 ⁺ ,5/2 ⁺	8.1 keV	5448	A ₂ (2)=+0.29 4, A ₄ (2)=+0.23 5, L(2)=1, J(2)=3/2, Γ(2)=7.8 (1970Ma16).
6414 5	5/2 ⁺	6.0 keV	5463	A ₂ (1)=+0.30 4, A ₄ (1)=+0.65 4, L(1)=2, J(1)=5/2, Γ(1)=0.185 (1970Ma16).
				A ₂ (3)=+0.12 3, A ₄ (1)=+0.02 5, L(3)=0, J(3)=1/2, Γ(3)=0.141 (1970Ma16).
6435 5	5/2 ⁻	10.4 keV	5485	A ₂ (2)=-0.27 7, A ₄ (1)=+0.28 7, L(2)=0+2, J(2)=1/2+(5/2), Γ(2)=0.007+0.149 (1970Ma16).
				A ₂ (3)=+0.36 4, A ₄ (3)=+0.05 5, L(3)=1, Γ(3)=0.262 (1970Ma16).
6458 5	(3/2 ⁻)	4.9 keV	5508	A ₂ (3)=-0.43 10, A ₄ (3)=-0.02 13, L(3)=(1), Γ(3)=0.048 (1970Ma16).
6469 5	5/2 ⁻	12.1 keV	5521	L(1)=3, J(1)=5/2, Γ(1)=0.02 (1974MiYW).
				L(3)=1, Γ(3)=0.1 (1974MiYW).
6476 & 5			5527 &	
6507 & 5			5558 &	
6513 5	5/2 ⁺	18.8 keV	5565	A ₂ (1)=+0.70 6, A ₄ (1)=+0.75 7, L(1)=2, J(1)=5/2, Γ(1)=0.206 (1970Ma16).
				A ₂ (3)=+0.08 5, A ₄ (3)=+0.11 6, L(3)=0, J(3)=1/2, Γ(3)=0.308 (1970Ma16).

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$^{40}\text{Ca}(\text{p,p}),(\text{p,p}'\gamma):\text{res}$ **1980Wa11,1975Ko13,1974Mi16 (continued)** ^{41}Sc Levels (continued)

E(level) [†]	J ^π [#]	Γ [@]	E(p)(lab) [‡]	Comments
6522 & 5			5574 &	A ₂ (3)=+0.08 5, A ₄ (3)=+0.11 6, L(3)=0, J(3)=1/2, Γ(3)=0.308 (1970Ma16).
6533 5	5/2 ⁺	1.3 keV	5585	A ₂ (2)=+0.03 4, A ₄ (3)=-0.05 6, L(2)=1, J(2)=1/2, Γ(2)=1.27 (1970Ma16). Other: Γ(2)=0.1 (1974MiYW).
6572 5	5/2 ⁻	4.5 keV	5625	A ₂ (3)=-0.63 6, A ₄ (3)=+0.10 8, L(3)=1, Γ(3)=0.143 (1970Ma16).
6585 5	1/2 ⁻	4.5 keV	5638	E(p): average from 1970Ma16 and 1974MiYW. Angular distribution asymmetric, A ₁ =0.85 7, implying interference of resonances having the same spin (1/2) and opposite parity (1970Ma16). L(1)=1, J(1)=1/2, Γ(1)=22 (1974MiYW).
6589 5	1/2 ⁺		5642	E(p): average from 1970Ma16 and 1974MiYW. Angular distribution asymmetric, A ₁ =0.90 9, implying interference of resonances having the same spin (1/2) and opposite parity (1970Ma16). L(1)=0, J(1)=1/2, Γ(1)=22 (1974MiYW).
6610 5	1/2 ⁺	9.5 keV	5664	A ₂ (1)=+0.27 10, A ₄ (1)=+0.00 10, L(1)=0, J(1)=1/2 (1970Ma16). Angular distribution asymmetric, A ₁ =0.90 7, implying interference of resonances having the same spin (1/2) and opposite parity (1970Ma16).
6622 5	5/2 ⁺	3.2 keV	5676	A ₂ (1)=+0.17 8, A ₄ (1)=+0.74 12, L(1)=2, J(1)=5/2 (1970Ma16). A ₂ (3)=+0.06 5, A ₄ (3)=-0.05 7, L(3)=0, J(3)=1/2, Γ(3)=0.193 (1970Ma16).
6643 & 5			5698 &	
6651 5	9/2 ⁺	4.0 keV	5706	A ₂ (2)=+0.55 4, A ₄ (2)=-0.15 6 (1970Ma16), L(2)=1, Γ(2)=0.03 (1974MiYW). Other: J(2)=1/2, Γ(2)=3.57 (1970Ma16). L(3)=0, J(3)=1/2, Γ(3)=0.09 (1970Ma16). L(4)=1, Γ(4)=0.48 (1970Ma16).
6691 5	3/2 ⁻	3.2 keV	5747	A ₂ (1)=+0.38 23, A ₄ (1)=-0.06 32, L(1)=1, J(1)=3/2, Γ(1)=0.42 (1970Ma16). A ₂ (3)=+0.01 5, A ₄ (3)=-0.10 6, L(3)=1, J(3)=1/2, Γ(3)=2.6 (1970Ma16).
6700 5	5/2 ⁺	6.2 keV	5756	A ₂ (1)=+1.41 5, A ₄ (1)=+0.92 5, L(1)=2, J(1)=5/2, Γ(1)=1.57 (1970Ma16). A ₂ (2)=+0.04 5, A ₄ (2)=+0.07 8, L(2)=1, J(2)=1/2, Γ(2)=1.23 (1970Ma16). A ₂ (3)=+0.00 4, A ₄ (3)=+0.02 6, L(3)=0, J(3)=1/2, Γ(3)=2.76 (1970Ma16). J ^π : other: 5/2 ⁽⁻⁾ (1974MiYW), with L(1)=(3), L(2)=(0), L(3)=(1).
6730 & 5			5787 &	Inelastic branch to 3904 (1970Ma16).
6741 5	5/2 ⁺	7.2 keV	5798	J ^π : from 1970Ma16. Other: (1/2 ⁺) in 1974MiYW. A ₂ (2)=+0.03 3, A ₄ (2)=+0.05 4, L(2)=1, J(2)=1/2, Γ(2)=0.243 (1970Ma16). A ₂ (3)=-0.17 4, A ₄ (3)=+0.05 6, L(3)=0, Γ(3)=0.121 (1970Ma16).
6752 & 5			5810 &	Inelastic branches to 3737 and 3904 (1970Ma16).
6772 5	(3/2 ⁻)		5830	L(1)=1, J(1)=3/2, (1974MiYW).
6783 5	5/2 ⁻	10.4 keV	5841	A ₂ (1)=+0.86 6, A ₄ (1)=-0.22 7 (1970Ma16). A ₂ (3)=-0.87 4, A ₄ (3)=+0.12 6, L(3)=1, Γ(3)=0.240 (1970Ma16). J ^π : other: 5/2 ⁻ , 7/2 ⁻ , with no inelastic cross section.
6824 5	5/2 ⁺	4.1 keV	5883	Additional information 1. A ₂ (1)=+1.07 6, A ₄ (1)=+0.76 9, L(1)=2, J(1)=5/2, Γ(1)=0.030 (1970Ma16). A ₂ (2)=-0.10 5, A ₄ (2)=-0.05 7, L(2)=1, Γ(2)=0.078 (1970Ma16). A ₂ (3)=+0.07 5, A ₄ (3)=-0.02 7, L(3)=0, J(3)=1/2, Γ(3)=0.077 (1970Ma16).
6841 5	5/2 ⁻	6.3 keV	5901	A ₂ (2)=-0.13 6, A ₄ (2)=0.00 8, L(2)=0, J(2)=1/2, Γ(2)=1.36 (1970Ma16). A ₂ (3)=+0.17 5, A ₄ (3)=+0.07 7, L(3)=1, Γ(3)=4.25 (1970Ma16). Other: Γ(2)=0.2, Γ(3)=1.5 (1974MiYW).
6857 5	3/2 ⁻	9.6 keV	5917	A ₂ (3)=-0.51 1, A ₄ (3)=+0.15 3, L(3)=1, J(3)=3/2, Γ(3)=0.55 (1970Ma16).
6872 5	(1/2,3/2) ⁻		5933	
6880 5	9/2 ⁺	1.3 keV	5941	L(1)=4, Γ(1)=(0.02) (1974MiYW). L(2)=1, Γ(2)=(0.14) (1974MiYW). L(3)=2, Γ(3)=(0.26) (1974MiYW). L(4)=1, Γ(4)=(0.012) (1974MiYW). Other: A ₂ (2)=0.10 2, A ₄ (2)=0.05 5 and A ₂ (3)=+0.95 1, A ₄ (3)=+0.48 2, L(3)=2, J(3)=5/2, Γ(3)=0.79, Γ(4)=0.046 (1970Ma16).
6895 5	(9/2 ⁺)	3.4 keV	5956	L(4)=(1), Γ(4)=0.008 (1974Mi16,1974MiYW).
6908 5	5/2 ⁻	6.9 keV	5970	

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$^{40}\text{Ca}(\text{p,p}),(\text{p,p}'\gamma):\text{res}$ **1980Wa11,1975Ko13,1974Mi16 (continued)** ^{41}Sc Levels (continued)

E(level) [†]	J ^π #	Γ [@]	E(p)(lab) [‡]	Comments	
6923 5	(5/2) ⁻	4.5 keV	5985	E(p)(lab): doublet (1970Wh06). A ₂ (2)=-0.08 6, A ₄ (2)=+0.05 9, L(2)=(0), J(2)=(1/2), Γ(2)=0.072 (1970Ma16). Other: Γ(2)=0.25 (1974MiYW). A ₂ (3)=0.57 6, A ₄ (3)=+0.12 9 (1970Ma16), L(3)=1, Γ(3)=0.4 (1974Mi16,1974MiYW). Other: Γ(3)=0.203 (1970Ma16).	
6947 5	5/2 ⁺	1.3 keV	6010	A ₂ (2)=-0.11 4, A ₄ (2)=+0.21 6, L(2)=(1), Γ(2)=1.28 (1970Ma16).	
6970 4		6.9 keV	6033	J ^π : from 1970Ma16,1980Al13. Other: 1/2 ⁺ in 1980Wa11. Γ: Other: 20 keV (1980Wa11). A ₂ =0.541 28, δ=+0.095 18 (1980Al13). A ₂ (2)=+0.04 1, A ₄ (2)=-0.02 2, L(2)=1, J(2)=1/2, Γ(2)=0.88 (1970Ma16). A ₂ (2)=+0.62 4, A ₄ (2)=-0.06 2, L(2)=1, J(2)=3/2, Γ(2)=0.88 (1970Ma16). A ₂ (3)=+0.49 9, A ₄ (3)=+0.23 11, L(3)=2, J(3)=5/2, Γ(3)=0.427 (1970Ma16).	
6996 5	9/2 ⁺	1.3 keV	6060	A ₂ (2)=+0.62 4, A ₄ (2)=-0.06 2, L(2)=1, J(2)=3/2, Γ(2)=0.88 (1970Ma16). A ₂ (3)=+0.49 9, A ₄ (3)=+0.23 11, L(3)=2, J(3)=5/2, Γ(3)=0.427 (1970Ma16).	
7004 5	(9/2 ⁺)	<1.0 keV	6068	L(4)=1, Γ(4)=(0.05) (1974MiYW).	
7022& 5	5/2 ⁺	3.2 keV	6086&	A ₂ (2)=-0.19 3, A ₄ (2)=+0.06 5, L(2)=1, Γ(2)=2.9 (1970Ma16). Other: Γ(2)=0.5 (1974MiYW). L(3)=(0), Γ(3)=(0.1) (1974MiYW). A ₂ (3)=-0.97 2, A ₄ (3)=+0.09 4, L(3)=1, Γ(3)=2.8 (1970Ma16).	
7033 4			6098		
7069 5	5/2 ⁻	9.3 keV	6135	A ₂ (2)=-0.27 1, A ₄ (2)=+0.02 2, L(2)=1, Γ(2)=14.3 (1970Ma16). Other: L(2)=1, Γ(2)=7.6 (1974MiYW). L(3)=0, Γ(3)=0.7 (1974MiYW). J ^π : A ₂ =0.450 17, δ=-0.002 16 (1980Al13). L(3)=1 (1970Ma16). Additional information 2.	
7078& 5	5/2 ⁺	19.8 keV	6144&		Doublet J=1/2 ⁻ and J=3/2 ⁺ (1970Ma16). Additional information 3.
7107 5			6174		
7113 5	(3/2,5/2) ⁻	14.0 keV	6180		
7123 4	5/2 ⁺	7.7 keV	6190		
7142 5		12.0 keV	6209		
7177 5	1/2 ⁻ ,3/2 ⁺ ,7/2 ⁻	40 keV	6245	L(2)=1, Γ(2)=13 (1974MiYW).	
7201 5	5/2 ⁺		6270	J ^π : A ₂ =0.198 42, A ₄ =-0.061 25, δ=-0.150 24 (1980Al13).	
7206	5/2 ⁻	12 keV	6275	Inelastic branches to 3352 and 3904 (1974MiYW).	
7245 5			6315	J ^π : from 1980Wa11. Other: (3/2 ⁻) in 1974MiYW. Γ(3)=(9) (1974MiYW).	
7264	5/2 ⁺	9 keV	6335	Inelastic branch to 3352 (1974MiYW).	
7279 5			6350	L(2)=1, Γ(2)=6 (1974MiYW). J ^π : A ₂ =0.449 25, δ=+0.085 19 (1980Al13).	
7297 5	(7/2 ⁺)	23 keV	6368	J ^π : from 1974MiYW. Other: 1/2 ⁻ ,3/2 ⁺ in 1980Wa11. L(4)=(1), Γ(4)=(0.03) (1974MiYW).	
7313	5/2 ⁺		6385	Inelastic branches to 3352 and 3904 (1974MiYW).	
7333 5	5/2 ⁻	10 keV	6405	J ^π : from 1980Wa11. Other: 5/2,7/2 ⁻ in 1974Mi16.	
7338 5			6410	Inelastic branch to 3352 (1974MiYW).	
7347 5	(5/2 ⁺)	8 keV	6420	L(2)=1, Γ(2)=1 (1974MiYW).	
7352 5	(9/2 ⁺)		6425	L(4)=(1), Γ(4)=(0.15) (1974MiYW).	
7382	(9/2 ⁺)	10 keV	6455	Inelastic branches to 3352, 3737 and 3904 (1974MiYW).	
7396 5			6470	Inelastic branch to 4491 (1974MiYW).	
7406 5	(5/2)	10 keV	6480	Inelastic branch to 3352 (1974MiYW).	
7421	(3/2 ⁺)		6495	Inelastic branch to 3904 (1974MiYW).	
7469 5			6545	L(2)=1, Γ(2)=(0.7) (1974MiYW).	

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$^{40}\text{Ca}(\text{p,p}),(\text{p,p}'\gamma):\text{res}$ **1980Wa11,1975Ko13,1974Mi16 (continued)** ^{41}Sc Levels (continued)

E(level) [†]	J π [#]	Γ [@]	E(p)(lab) [‡]	Comments
7474 5		44 keV	6550	L(3)=(0), $\Gamma(3)=(1.1)$ (1974MiYW).
7489 5	(7/2 ⁻ , 9/2 ⁺)		6565	Inelastic branch to 4491 (1974MiYW).
7494			6570	Inelastic branches to 3337 and 3904 (1974MiYW).
7523 5	(7/2 ⁺)		6600	
7538 5	3/2 ⁽⁺⁾	8 keV	6615	$\Gamma(1)=0.4$ (1974MiYW).
				$\Gamma(3)=0.7$ (1974MiYW).
7557 5	3/2 ⁻	12 keV	6635	L(3)=1, $\Gamma(3)=0.8$ (1974MiYW).
				$\Gamma(4)=(0.01)$ (1974MiYW).
7572 5	3/2 ⁺	10 keV	6650	$\Gamma(1)=0.4$ (1974MiYW).
				L(3)=0, $\Gamma(3)=0.6$ (1974MiYW).
7606 5	(5/2 ⁻)		6685	$\Gamma(1)=(0.4)$ (1974MiYW).
				L(3)=(1), $\Gamma(3)=(2)$ (1974MiYW).
7640 5	(9/2 ⁺)	30 keV	6720	Inelastic branch to 4491 (1974MiYW).
7650 5	(5/2 ⁺)		6730	L(2)=(1), $\Gamma(2)=(1.4)$ (1974MiYW).
7660 5	1/2 ⁻	30 keV	6740	L(1)=1, $\Gamma(1)=15$ (1974MiYW).
				L(3)=1, $\Gamma(3)=9$ (1974MiYW).
7718 5	3/2 ⁻	20 keV	6800	L(3)=1, $\Gamma(3)=4$ (1974MiYW).
7742 5	(3/2 ⁺)		6825	Inelastic branch to 3352 (1974MiYW).
7777 5	7/2 ⁻	35 keV	6860	L(2)=(0), $\Gamma(2)=2$ (1974MiYW).
				L(3)=1, $\Gamma(3)=30$ (1974MiYW).
7815 5	(1/2)		6900	Inelastic branch to 3352 (1974MiYW).
7830 5	5/2 ⁻	33 keV	6915	$\Gamma(2)=3$ (1974MiYW).
				$\Gamma(3)=4$ (1974MiYW).
7855 5	(9/2 ⁺)	27 keV	6940	L(4)=1 (1974MiYW).
7874 5	(1/2 ⁻)	20 keV	6960	L(2)=(3), $\Gamma(2)=(2.5)$ (1974MiYW).
				L(3)=(1), $\Gamma(3)=(4.5)$ (1974MiYW).
				Also a branch to 3352 (1974MiYW).
7894 5			6980	Inelastic branches to 3737 and 4491 (1974MiYW).
7903 5	(1/2)		6990	Inelastic branches to 3352, 3737 and 3904 (1974MiYW).
7938 5			7025	Inelastic branch to 4491 (1974MiYW).
7947 5			7035	Inelastic branch to 3737 (1974MiYW).
7962 5			7050	Inelastic branch to 3352 (1974MiYW).
7981 5			7070	Inelastic branch to 4491 (1974MiYW).
8006 5	(3/2 ⁻)	25 keV	7095	$\Gamma(3)=(15)$ (1974MiYW).
8089 5	(3/2 ⁻)	50 keV	7180	$\Gamma(1)=(10)$ (1974MiYW).
				L(3)=1, $\Gamma(3)=(24)$ (1974MiYW).
8147 5	(5/2 ⁺)	75 keV	7240	L(2)=(1), $\Gamma(2)=(22)$ (1974MiYW).
8450 10	(9/2 ⁺)		7550	L(5)=(1), $\Gamma(5)=(0.05)$ (1973Ta26).
8645 10	(9/2 ⁺)		7750	L(5)=(1), $\Gamma(5)=(0.12)$ (1973Ta26).
8879 10	9/2 ⁺	8 keV	7990	L(5)=1, $\Gamma(5)=0.32$ (1973Ta26).
9128 10	9/2 ⁺	18 keV	8245	L(5)=1, $\Gamma(5)=0.50$ (1973Ta26).
9269 10	9/2 ⁺	10 keV	8390	L(5)=1, $\Gamma(5)=0.78$ (1973Ta26).
9415 10	9/2 ⁺	11 keV	8540	L(5)=1, $\Gamma(5)=0.85$ (1973Ta26).
9513 10	9/2 ⁺	15 keV	8640	L(5)=1, $\Gamma(5)=0.50$ (1973Ta26).
9659 10	9/2 ⁺	16 keV	8790	L(5)=1, $\Gamma(5)=0.42$ (1973Ta26).
9698 10	9/2 ⁺	12 keV	8830	L(5)=1, $\Gamma(5)=0.40$ (1973Ta26).
9815 10	9/2 ⁺	13 keV	8950	L(5)=1, $\Gamma(5)=0.33$ (1973Ta26).

[†] Excitation energies are deduced (evaluators) from S(p)(^{41}Sc)+E(p)(c.m.), where S(p)=1085.00 8 (2012Wa38).[‡] E(p)(lab) is the weighted average from 1975Ko13, 1974Wi09, 1974Ve11, 1972Kl03 for E=3400-5800; from 1970Ma16 for E=5800-6900; from 1974Mi16 and 1973Ta26 for E=6900-8800; from 1980Wa11, 1974Mi16, 1970Ma16, 1973Ta26 for E=8800-9900, with exceptions noted.

$^{40}\text{Ca}(\text{p,p}),(\text{p,p}'\gamma):\text{res}$ [1980Wa11](#),[1975Ko13](#),[1974Mi16](#) (continued)

^{41}Sc Levels (continued)

From [1975Ko13](#), [1974Wi09](#), [1974Ve11](#), [1970Lo18](#) for E=3400-5800; from [1973Tr06](#), [1970Ma16](#) for E=5800-6900; from [1974Mi16](#) for E=5450-7300; from [1973Ta26](#) for E=7300-9900.

@ Γ are from [1974Wi09](#) for E=3400-3800; from [1975Ko13](#) for E=3800-5800; from [1970Ma16](#) for E=5800-7250; from [1974Mi16](#) for E=7250-8150; from [1973Ta26](#) for E=8150-9900, with exceptions noted.

& A proton branch was observed, but too weak for measurement of parameters.