Target isotope: $^{39}_{19}$K $I^{\pi}_{\circ} = 3/2^+$ *Abundance:* 93.2581(44) % $S_{\rm p} = 8328.24(9)$ keV

$^{40}_{20}$Ca(p)

$E_\circ$ [keV]	J^π	T	$\Gamma_{\rm p}$ [eV]	$\Gamma_{\rm p}$ [eV]	$S_{\rm pp}$ [keV]	$S_{\rm p\gamma}$ [eV]	Γ [keV]	$(2J+1)\theta^2_{\rm p}$ [keV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.			
622.23(12)	2^+					0.09(4)			607	8935(1)	90En08			
683.5(2)	$\langle 1^-,2^+\rangle$					0.15(6)			666	8995(1)	90En08			
783.23(11)	3^-	$\langle 0\rangle$				0.3(1)			764	9092(1)	66Le08	90En08		
828.8(2)	$\langle 2,3\rangle^-$	0				0.6(2)			808	9136(1)	66Le08	90En08		
904.3(1)	$\langle 2,3\rangle^-$	0				0.4(2)			882	9210(1)	90En08			
921.7(1)	$\langle 1^-$–$3^-\rangle$					0.3(1)			899	9227(1)	90En08			
922.4(1)	$\langle 1,2^+\rangle$					incl			899	9228(1)	90En08			
1061.0(1)	3^-	0				0.4(2)			1034	9363(1)	66Le08	88Sc23	90En08	63Si13
1076.7(2)						0.24(10)			1050	9378(1)	66Le08	90En08		
1087.4(2)	2^+					0.26(10)			1060	9388(1)	66Le08	88Sc23	90En08	
1095.0(3)	$\langle 3^-,4^+\rangle$					0.09(4)			1068	9396(1)	66Le08	90En08	63Si13	
1104.4(2)	2^-	1			0.7(1)	0.36(14)	0.14	0.99	1077	9405(1)	70De30	66Le08	88Sc23	90En08
1106.0(6)	0^+	1				0.40(10)			1078	9407(1)	90En08			
1112.2(2)						0.18(7)			1084	9413(1)	90En08			
1118.8(2)	3^-	1				0.6(2)			1091	9419(1)	66Le08	88Sc23	90En08	63Si13
1129.3(2)	$\langle 3,4\rangle^-$	0				2.8(1)			1101	9429(1)	66Le08	88Sc23	90En08	
1132.8(4)	1^-	1			0.7(1)	incl	0.23	0.81	1104	9433(1)	70De30	66Le08	88Sc23	90En08
1154.85	3^-	0			0.6(1)	0.8(3)	0.09	0.58	1126	9454(1)	70De30	66Le08	88Sc23	90En08
1202(2)						0.4(2)			1172	9501(2)	66Le08	90En08		
1239.33	$\langle 3,4\rangle^+$					1.1(4)			1208	9537(1)	66Le08	90En08		
1240.9(5)	1^-				1.2(2)	0.2(1)	0.4	0.65	1210	9538(1)	70De30	66Le08	90En08	
1307.7(4)	3^-	1			3.4(7)	2.4(10)		1.19	1275	9603(1)	70De30	66Le08	88Sc23	90En08
1309.7(4)	1^-	1			incl.	5(2)	0.19(5)	incl.	1277	9605(1)	70De30	66Le08	88Sc23	90En08
1337.2(9)						0.3			1304	9632(2)	66Le08	90En08		
1346.6(2)	2^-	1				5(2)			1313	9641(1)	66Le08	88Sc23	90En08	
1361.7(9)	$\langle 1,2^+\rangle$					0.2(1)			1328	9656(1)	66Le08	90En08		
1368.6(2)	$\langle 0$–$3\rangle^-$					0.6(2)			1334	9663(1)	90En08			
1375.1(2)	3^-	1			1.8(4)	2.4(10)		0.43	1341	9669(1)	70De30	66Le08	66Le08	90En08
1488.5(1)	3	1				2.2(9)			1451	9780(1)	66Le08	66Le08	88Sc23	90En08
1494.7(2)	$\langle 1,2^+\rangle$					1.0(4)			1457	9786(1)	66Le08	88Sc23	90En08	
1512.1(7)	$\langle 1$–$3\rangle^-$				1.0(2)	0.37(15)		0.12	1474	9803(1)	70De30	66Le08	90En08	
1516.2(9)						0.3			1478	9807(1)	66Le08	90En08		
1521.2(2)	$\langle 3$–$5^-\rangle$					0.27(11)			1483	9811(1)	66Le08	90En08		
1540.1(2)	$\langle 1^-$–$4^+\rangle$					0.8(3)			1502	9830(1)	66Le08	90En08		
1545.8(2)	$\langle 2^+$–$5^-\rangle$					0.6(3)			1507	9835(1)	66Le08	90En08		
1563.8(2)	$\langle 1$–$3\rangle^-$				1.7(3)	1.1(4)		0.16	1525	9853(1)	70De30	66Le08	90En08	
1571.1(3)	$\langle 4$–$6\rangle^-$					0.5(2)			1532	9860(1)	90En08			
1576.7(2)	1	1				6(2)	0.10(5)		1537	9866(1)	66Le08	88Sc23	90En08	
1580.9(4)	$\langle 1,2^+\rangle$					3.1(12)	0.9(2)		1541	9870(1)	66Le08	88Sc23	90En08	
1611.0(3)						0.6(2)			1571	9899(1)	90En08			
1634.3(2)	$\langle 3$–$5^-\rangle$					0.4(2)			1593	9922(1)	66Le08	90En08		
1653.2(2)						0.13(5)			1612	9940(1)	90En08			
1667.8(2)	4^+	0				1.6(6)			1626	9954(1)	66Le08	66Le08	90En08	
1691.6(2)	$\langle 3$–$5\rangle$					1.1(4)			1649	9977(1)	90En08			
1709(2)						0.5(2)			1666	9994(2)	90En08			

(continued) $^{40}_{20}\mathbf{Ca}$(p)

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_α [eV]	S_pp [keV]	$S_{\mathrm{p}\gamma}$ [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ [keV]	$(2J{+}1)\theta^2_\mathrm{p}$ [keV]	E_cm [keV]	E^* [keV]	Ref.	
1756.6(2)	$\langle 2,3\rangle^-$	1				0.5(2)				1713	10041(1)	66Le08	90En08
1761.9(5)	$\langle 3^- – 7^-\rangle$									1718	10046(1)	90En08	
1765.6(2)	4^-	1				4.5(19)				1721	10050(1)	66Le08	90En08
1774.5(2)						0.17(7)				1730	10058(1)	90En08	
1781(2)	$\langle 1^-,2^+\rangle$	0					9.2(36)			1736	10065(2)	70De30	66Le08
1797.8(2)						0.9(4)				1753	10081(1)	90En08	
1849.1(2)	$\langle 3^-,4^+\rangle$	0				1.4(6)	7.9(24)			1803	10131(1)	70De30	66Le08
1854.1(15)			weak			$\langle 1.0\rangle$				1808	10136(2)	66Le08	90En08
1919.3(4)	1^-	0	1600	0.0	0.8(2)	0.6(2)	3.4(11)	0.27	0.019	1871	10200(1)	87Wa0A	70De30
1925.4(8)						0.2(1)				1877	10206(1)	90En08	
1931.0(2)	$\langle 3,4\rangle^-$					1.4(6)				1883	10211(1)	66Le08	90En08
1953.8(7)						1.3(5)				1905	10233(1)	66Le08	90En08
1984.3(2)	3^-	0+1			2.8(6)	1.3(5)	1.5(5)	0.4	0.054	1935	10263(1)	70De30	66Le08
1989.6(5)	N	0				0.2(1)	1.7(5)			1940	10268(1)	70De30	90En08
1997.0(3)	$\langle 3–5\rangle^+$		1600	0.0		0.3(1)				1947	10275(1)	87Wa0A	90En08
2000.1(2)	1^-	0			3.4(7)	0.7(3)	3.4(10)	1.1	0.063	1950	10278(1)	70De30	90En08
2007.4(3)						0.7(3)				1957	10286(1)	90En08	
2042.0(4)	1^+	1				14(1)		0.09(2)		1991	10319(1)	66Le08	79Pa16
2057.1(15)	3^-	0	110	1.0			22(7)			2006	10334(1)	87Wa0A	70De30
2082.9(15)						0.6(2)				2031	10359(1)	90En08	
2086.8(15)	3^-	0	600	3.0	27(5)	2.1(8)	1.7(5)	3.9	0.39	2035	10363(1)	87Wa0A	70De30
2088.8	1^-		1100	5.0						2037	10365(1)	87Wa0A	
2101.1(15)	1^-		600	2.0		1.2(5)				2049	10377(1)	87Wa0A	90En08
2108.8(2)	$\langle 1^-,2^+\rangle$	0				2.0(8)	2.9(9)			2056	10384(1)	70De30	90En08
2140.8(2)	3	1				5.8(10)				2087	10416(1)	66Le08	90En08
2145.8(10)	1^-		500	2.8		0.8(3)	8.8(26)			2092	10420(1)	87Wa0A	70De30
2156.7(2)	N	0				3.1(10)	3.8(11)			2103	10431(1)	70De30	90En08
2167.8(6)						2.5(8)				2114	10442(1)	90En08	
2169.6(10)	2^-	0	4000		3.1(6)	1.7(5)	6.5(20)	0.44	0.035	2115	10444(1)	87Wa0A	70De30
2173.1(10)	1^-		150	1.0						2119	10447(1)	87Wa0A	
2197.2(15)	$\langle 3,5\rangle^-$	0				0.6(2)				2142	10471(2)	90En08	
2206.1(15)						1.0(4)				2151	10479(2)	90En08	
2231.1(15)	$\langle 3–5\rangle^-$					1.1(4)				2175	10504(2)	90En08	
2244.4(15)	1^-	0	1200	10		2.5(10)	18(6)			2188	10517(2)	87Wa0A	70De30
2245.3(10)	1^+		300							2189	10517(2)	87Wa0A	
2258.0(15)	1^+		400			3.7(15)				2202	10530(2)	87Wa0A	90En08
2270.3(15)	0^+	0	160	25		1.0(3)	41(13)			2213	10542(2)	87Wa0A	70De30
2281.5(15)						1.8(7)				2224	10553(2)	90En08	
2326.4(10)	3^-	0	150	5.0			63(19)			2268	10597(2)	87Wa0A	70De30
2328.6(10)	1^+		200							2270	10599(2)	87Wa0A	
2337.8(10)	0^+		200	0.0						2279	10608(2)	87Wa0A	
2349.3(10)	2^-		3500		15(3)		14(4)	5.0	0.11	2291	10619(2)	70De30	66Le08
2352.2(10)	0^+		30	8.0						2293	10622(2)	87Wa0A	
2364.0(2)	1^-		1100	1.5		2.1(8)				2305	10633(1)	87Wa0A	90En08
2370.6(1)	$\langle 3^- – 5^-\rangle$	1				11(4)				2311	10640(1)	66Le08	90En08

(continued)

$^{40}_{20}\mathbf{Ca}$(p)

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_pp [keV]	$S_{\mathrm{p}\gamma}$ [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ [keV]	$(2J{+}1)\theta^2_\mathrm{p}$ [keV]	E_cm [keV]	E^* [keV]	Ref.	
2378.1(4)	N	0					1.5(6)	4.0(12)			2319	10647(2)	70De30	90En08
2385.1(1)	1^-		590		5.0	1.2(2)	8(3)			0.003	2325	10654(1)	70De30	66Le08
2389.1(10)	2^+	0	440	350	4			16(5)	0.35		2329	10658(2)	87Wa0A	90Bu02
2398.4(10)	2^-		2000								2338	10667(2)	87Wa0A	
2402.8(3)	1^-					17(3)	18(7)	<1	5.7	0.11	2343	10671(2)	70De30	66Le08
2406.1(2)	$\langle 1^- – 4^+ \rangle$					0.5(1)	5(2)			0.006	2346	10674(1)	70De30	66Le08
2407.6(10)	1^-	0	1500		60			200(60)	0.33		2347	10676(2)	87Wa0A	90En08
2425.5(10)	1^+		1100			0.7(1)	3.4(14)	<1	0.14	0.002	2365	10693(2)	70De30	66Le08
2433.7(10)	0^+		600		1.0		10(4)				2373	10701(2)	87Wa0A	66Le08
2455.5(10)	1^+		1100				2.1(7)				2394	10722(2)	87Wa0A	90En08
2473.9(10)	1^-	0+1	2200		6.0	1.5(3)	4.6(18)	16(5)	0.5	0.009	2412	10740(2)	70De30	66Le08
2482.9(10)	0^+		300		10		15(6)	22(7)			2421	10749(2)	70De30	66Le08
2488.4(2)	$\langle 3–5 \rangle$						4.5(18)				2426	10754(1)	90En08	
2506.8(10)	1^+		50				7(3)				2444	10772(2)	87Wa0A	90En08
2513.0(10)	2^+		800	180	4	35(7)	16(6)	77(23)	12	0.18	2450	10778(2)	87Wa0A	90Bu02
2515.4(10)	1^-		1600		10		6(2)	20(6)	0.18		2452	10781(2)	87Wa0A	90En08
2518.0(10)	0^-		700								2455	10783(2)	87Wa0A	
2523.1(3)							3.0(12)				2460	10788(1)	90En08	
2538.1(10)	0^+		500		200		1.1(4)	220(66)			2475	10803(2)	87Wa0A	70De30
2552.0(10)	2^-		6000			13(3)	12.0(5)	<1		0.065	2488	10816(2)	87Wa0A	70De30
2552.2(10)	3^+		500								2488	10817(2)	87Wa0A	
2569.2(10)	3^-		25		0.9		2.7(10)	24(7)			2505	10833(2)	87Wa0A	70De30
2585.8(4)	2^-	0	11000			30(6)	4.4(17)	10(3)		0.14	2521	10849(1)	87Wa0A	70De30
2588.7(10)	2^-		2500								2524	10852(2)	87Wa0A	
2598.2(10)	2^+	0	60	40	5			24(7)	0.045		2533	10862(2)	90Bu02	70De30
2606.0(4)	1^-		26000		70		5.2(19)				2541	10869(1)	87Wa0A	90En08
2606.7(10)	0^+		400		0.0						2542	10870(2)	87Wa0A	
2611.0(10)	1^-		4000		0.0						2546	10874(2)	87Wa0A	
2637.0(10)	1^+		410								2571	10899(2)	87Wa0A	
2652.9(20)	1^-		5000		40	6.9(20)	7(3)	110(33)	2.3	0.028	2587	10915(3)	70De30	66Le08
2653.9(10)	1^+		700								2588	10916(2)	87Wa0A	
2659.9(4)	$\langle 2^+ – 4^+ \rangle$						9(4)				2593	10922(2)	66Le08	90En08
2671.3(10)	1^-	0	2000		8	15(3)		53(16)	5	0.059	2605	10933(2)	87Wa0A	70De30
2685.8(10)	2^+	0	150	215	11	30(6)			0.23	0.12	2619	10947(2)	90Bu02	70De30
2689.9(10)	$[2^-]$	0	7000				16(4)	100(30)	10		2623	10951(2)	87Wa0A	90En08
2692.7(10)	0^+		200		20		4.0(16)	27(8)			2625	10954(2)	87Wa0A	70De30
2716.6(12)	$\langle 3–5 \rangle$						9(3)				2649	10977(2)	90En08	
2728.7(4)	2^-		9000				8(3)				2661	10989(2)	87Wa0A	90En08
2729.4(10)	1^+		400								2661	10989(2)	87Wa0A	
2739.2(20)	3^-		200		2.0	20(4)	11(4)	<1	6.7	0.071	2671	10999(3)	87Wa0A	70De30
2740.6(20)	3^-		200		0.8		2.9(12)	35(11)			2672	11000(3)	87Wa0A	70De30
2747.7(20)	1^-		5000		10	2.1(4)	14(5)	9(3)	0.3	0.007	2679	11007(3)	87Wa0A	70De30
2764.6(10)	1^-	0	1000		10	0.7(2)	6(2)	270(81)	0.27	0.003	2696	11024(2)	87Wa0A	70De30
2765.1(10)	3^-		100		12						2696	11024(2)	87Wa0A	
2777.5(10)	1^+		100								2708	11036(2)	87Wa0A	

(continued) $^{40}_{20}\mathbf{Ca}$(p)

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_pp [keV]	$S_{\mathrm{p}\gamma}$ [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ [keV]	$(2J{+}1)\theta_\mathrm{p}^2$ [keV]	E_cm [keV]	E^* [keV]	Ref.		
2785.9(10)	2^+	0	500	500	2	1.0(2)	6(2)	6(2)	0.50	0.002	2716	11045(2)	90Bu02	70De30	90En08
2815.7(10)	2^+		660		0.6		31(12)				2745	11074(2)	87Wa0A	66Le08	90En08
2820.7(10)	1^-	0	1200		4.0			11(3)			2750	11078(2)	87Wa0A	70De30	90En08
2826.1(10)	1^+		350								2755	11084(2)	87Wa0A		
2831.9(10)	0^+	0	100		6.0			6(2)			2761	11089(2)	87Wa0A	70De30	90En08
2850.1(10)	1^-		3900		0.0	5.2(10)		<1	5.2	0.015	2779	11107(2)	87Wa0A	70De30	90En08
2862.3(10)	0^+		100	40	6		5(2)	21(6)	0.046		2791	11119(2)	90Bu02	70De30	90En08
2872.7(10)	4^+	0	110		1.4		6(2)	19(6)			2801	11129(2)	87Wa0A	70De30	90En08
2889.2(10)	1^-		200		2.0						2817	11145(2)	87Wa0A		
2889.8(10)	1^+		200								2818	11146(2)	87Wa0A		
2901.5(10)	2^-		48000					12(4)			2829	11157(2)	87Wa0A	70De30	90En08
2905.9(10)	4^+		40		0.8						2833	11162(2)	87Wa0A		
2907.4(10)	2^+		3500		0.0						2835	11163(2)	87Wa0A		
2912.0(20)	4^+	0	80		3.0		2.0(8)	31(9)			2839	11167(3)	87Wa0A	70De30	90En08
2932.7(10)	3^-		1400		1.6						2859	11188(2)	87Wa0A		
2948.4(10)	2^-		6000								2875	11203(2)	87Wa0A		
2958.4(10)	3^-		2800		1.4	175(35)		<1	25	0.44	2884	11213(2)	87Wa0A	70De30	90En08
2963.7(20)	4^+		1400		1.0	3.0(6)		<1		0.001	2890	11218(3)	87Wa0A	70De30	90En08
2977.6(20)	2^-		3000			12(2)		<1	12	0.003	2903	11231(3)	87Wa0A	70De30	90En08
2993.4(10)	3^-	0	80		12			190			2919	11247(2)	87Wa0A	70De30	
3002.8(10)	1^+		300								2928	11256(2)	87Wa0A		
3007.8(10)	0^-		6000								2933	11261(2)	87Wa0A		
3011.4(10)	2^+	0	580	325	16			190	0.34		2936	11264(2)	90Bu02	87Wa0A	70De30
3032.0(10)	2^-		600								2956	11284(2)	87Wa0A		
3037.5(10)	1^+		1000								2962	11290(2)	87Wa0A		
3048.3(10)	1^+		400								2972	11300(2)	87Wa0A		
3050.6(10)	1^-		1200		0.0			14			2974	11303(2)	87Wa0A	74Na09	
3068.5(10)	0^-		1800								2992	11320(2)	87Wa0A		
3070.5(10)	2^+		470	475	41			440	0.52		2994	11322(2)	90Bu02	70De30	74Na09
3079.5(10)	1^-		4000		30			52	4.0(5)		3003	11331(2)	87Wa0A	70De30	74Na09
3087.7(10)	1^+		200								3011	11339(2)	87Wa0A		
3091.7(10)	2^-		40000								3014	11343(2)	87Wa0A		
3095.6(10)	4^+		20		0.5			18	4.5(5)		3018	11346(2)	87Wa0A	70De30	74Na09
3100.8(10)	1^+		800								3023	11352(2)	87Wa0A		
3112.0(10)	1^+		1200								3034	11362(2)	87Wa0A		
3115.7(10)	2^+		88	90	100			400	0.19		3038	11366(2)	90Bu02	70De30	74Na09
3116.7(10)	2^-		4400								3039	11367(2)	87Wa0A		
3118.0(10)	4^+		20		1.4			incl			3040	11368(2)	87Wa0A		
3121.2(10)	2^+		1400		4.0			incl			3043	11371(2)	87Wa0A		
3132.2(10)	2^+	0	2600	2500	65			360	3.5(5)		3054	11382(2)	90Bu02	70De30	74Na09
3143.4(10)	1^-		100		0.4						3065	11393(2)	87Wa0A		
3154.9(10)	1^-		3500		6.0						3076	11404(2)	87Wa0A		
3157.7(10)	1^+		220					20	<3		3079	11407(2)	87Wa0A	74Na09	
3165.7(10)	4^+	0	100		5.0			70	<3		3087	11415(2)	87Wa0A	70De30	74Na09
3171.4(10)	3^-		300		0.9						3092	11420(2)	87Wa0A		

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_pp [keV]	$S_{\mathrm{p}\gamma}$ [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ [keV]	$(2J{+}1)\theta_\mathrm{p}^2$ [keV]	E_cm [keV]	E^* [keV]	Ref.		
3184.1(10)	1^-	0	300		2.0			15	<3		3105	11433(2)	87Wa0A	74Na09	
3188.3(10)	2^+	0	200	200	15			170	0.22		3109	11437(2)	90Bu02	87Wa0A	74Na09
3199.0(10)	1^-		5000		340			950	5.8(5)		3119	11447(2)	87Wa0A	70De30	74Na09
3203.3(10)	1^+		600								3123	11452(2)	87Wa0A		
3207.4(10)	3^-	0	50		10			190	⟨3⟩		3127	11456(2)	87Wa0A	74Na09	
3212.5(10)	2^+	0	1000	1030	150			1500	1.2		3132	11460(2)	87Wa0A	70De30	74Na09
3217.3(10)	2^+	0	26		100			57	⟨3⟩		3137	11465(2)	87Wa0A	70De30	74Na09
3221.0(10)	2^-		400								3140	11469(2)	87Wa0A		
3232.4(10)	1^+		300								3152	11480(2)	87Wa0A		
3239.5(10)	0^+		100		6.0						3159	11487(2)	87Wa0A		
3242.5(10)	1^+		400					12	<3		3161	11490(2)	87Wa0A	74Na09	
3268.1(10)	2^+		500	500	115			800	<3		3186	11515(2)	90Bu02	87Wa0A	74Na09
3268.7(10)	1^-		4200		30			220	⟨3⟩		3187	11515(2)	87Wa0A	74Na09	
3272.6(10)	2^+		700		0.0						3191	11519(2)	87Wa0A		
3292.0(10)	2^-		8000								3210	11538(2)	87Wa0A		
3296.4(10)	2^+		600		17			350	3.5(5)		3214	11542(2)	87Wa0A	74Na09	
3297.9(10)	1^+		900								3216	11544(2)	87Wa0A		
3301.0(10)	2^-		18000								3218	11547(2)	87Wa0A		
3309.0(10)	1^-		35000		600						3226	11555(2)	87Wa0A		
3313.7(10)	2^+		400		0.0						3231	11559(2)	87Wa0A		
3318.3(10)	2^-		400								3235	11564(2)	87Wa0A		
3333.0(10)	2^-		1000								3250	11578(2)	87Wa0A		
3333.1(10)	2^+		180	180	45			210	<3		3250	11578(2)	90Bu02	87Wa0A	74Na09
3340.9(10)	2^-		150					270	4.0(5)		3257	11586(2)	87Wa0A	74Na09	
3352.8(10)	2^+		300		0.0			1030	5.5(5)		3269	11597(2)	87Wa0A	74Na09	
3358.0(10)	2^+		300		0.0						3274	11602(2)	87Wa0A		
3359.1(10)	2^+		250	250	30			1890	6.0(5)		3275	11603(2)	90Bu02	87Wa0A	74Na09
3361.1(10)	1^-		12000		1000			incl			3277	11605(2)	87Wa0A		
3367.1(10)	1^-		700		160			570	3.5(5)		3283	11611(2)	87Wa0A	74Na09	
3370.0(10)	2^-		500					130	6.2(5)		3286	11614(2)	87Wa0A	74Na09	
3384.9(10)	3^+		700					120	<3		3300	11629(2)	87Wa0A	74Na09	
3385.2(10)	2^+		800	70	15			incl			3301	11629(2)	90Bu02	87Wa0A	
3394.8(10)	1^-		80		10			70	<3		3310	11638(2)	87Wa0A	74Na09	
3401.8(10)	2^-		600								3317	11645(2)	87Wa0A		
3403.7(10)	2^+		200	600	2.0			200	4.0(5)		3319	11647(2)	90Bu02	87Wa0A	74Na09
3407.8(10)	2^+		100		80			1020	4.9(5)		3323	11651(2)	87Wa0A	74Na09	
3410.4(10)	2^+		1800	1500	90						3325	11653(2)	90Bu02	87Wa0A	
3419.0(10)	1^-		60		1500			270	⟨3⟩		3334	11662(2)	87Wa0A	74Na09	
3430.4(10)	2^-		200								3345	11673(2)	87Wa0A		
3434.7(10)	2^+		180	180	775			1080	4.0(5)		3349	11677(2)	90Bu02	87Wa0A	74Na09
3445.4(10)	1^+		500								3359	11688(2)	87Wa0A		
3447.2(10)	2^-		600								3361	11689(2)	87Wa0A		
3450.9(10)	4^+		12		9.0			90	3.5(5)		3365	11693(2)	87Wa0A	74Na09	
3454.5(10)	0^-		600								3368	11696(2)	87Wa0A		
3461.9(10)	0^+		4500		150			90	4.0(5)		3375	11704(2)	87Wa0A	74Na09	

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_pp [keV]	$S_{\mathrm{p}\gamma}$ [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ [keV]	$(2J{+}1)\theta_\mathrm{p}^2$ [keV]	E_cm [keV]	E^* [keV]	Ref.		
3463.0(10)	2^-		3000								3376	11705(2)	87Wa0A		
3466.3(10)	1^-		300		2.0			80	3.5(5)		3380	11708(2)	87Wa0A	74Na09	
3472.2(10)	1^+		200								3385	11714(2)	87Wa0A		
3474.4(10)	2^-		1500					70	3.0(5)		3387	11716(2)	87Wa0A	74Na09	
3480.0(10)	1^+		1500								3393	11721(2)	87Wa0A		
3483.8(10)	3^-		50		10			270	3.5(5)		3397	11725(2)	87Wa0A	74Na09	
3490.4(10)	1^-		640		3000			1940	5.7(5)		3403	11731(2)	87Wa0A	74Na09	
3490.5(10)	1^+		400								3403	11732(2)	87Wa0A		
3498.2(10)	2^-		3000								3411	11739(2)	87Wa0A		
3502.2(10)	2^+		240	750	320			1630	4.0(5)		3415	11743(2)	90Bu02	87Wa0A	74Na09
3504.8(10)	2^+		50		500						3417	11745(2)	87Wa0A		
3509.7(10)	1^-		700		2500			1710	5.2(5)		3422	11750(2)	87Wa0A	74Na09	
3513.7(10)	1^-		300		50			390	3.5(5)		3426	11754(2)	87Wa0A	74Na09	
3517.4(10)	1^+		600					140	3.5(5)		3429	11758(2)	87Wa0A	74Na09	
3528.2(10)	2^-		15000					130	5.0(5)		3440	11768(2)	87Wa0A	74Na09	
3543.5(10)	3^-		21		20			230	<3		3455	11783(2)	87Wa0A	74Na09	
3549.1(10)	2^+		3000	2200	340			1610	4.8(5)		3460	11789(2)	90Bu02	87Wa0A	74Na09
3553.5(10)	1^+		460								3465	11793(2)	87Wa0A		
3560.2(10)	4^+		10		170			320	<3		3471	11799(2)	87Wa0A	74Na09	
3565.3(10)	0^+		60		200			270	$\langle 3 \rangle$		3476	11804(2)	87Wa0A	74Na09	
3570.2(10)	1^+		1100								3481	11809(2)	87Wa0A		
3572.0(10)	2^+		1300	770	975			2130	4.0(5)		3483	11811(2)	90Bu02	87Wa0A	74Na09
3572.7(10)	3^-		260		2.0						3483	11812(2)	87Wa0A		
3581.9(10)	1^-		3500		30						3492	11821(2)	87Wa0A		
3592.4(10)	1^-		94	70	230			340	<3		3503	11831(2)	90Bu02	87Wa0A	74Na09
3601.0(10)	0^+		1000		50			120	5.2(5)		3511	11839(2)	87Wa0A	74Na09	
3606.0(10)	1^+		780								3516	11844(2)	87Wa0A		
3618.0(10)	2^+		580	325	60			420	4.4(5)		3528	11856(2)	90Bu02	87Wa0A	74Na09
3619.6(10)	1^+		1300								3529	11857(2)	87Wa0A		
3625.7(10)	3^-		410		8			180	4.0(5)		3535	11863(2)	87Wa0A	74Na09	
3627.2(10)	0^+		1600		0.0						3536	11865(2)	87Wa0A		
3631.4(10)	4^+		30		2.0						3541	11869(2)	87Wa0A		
3632.6(10)	2^+		10		30						3542	11870(2)	87Wa0A		
3634.9(10)	2^+		300	450	420			1300	3.9(5)		3544	11872(2)	90Bu02	87Wa0A	74Na09
3640.8(10)	1^-		300		15			190	4.1(5)		3550	11878(2)	87Wa0A	74Na09	
3647.5(10)	1^+		800								3556	11885(2)	87Wa0A		
3651.4(10)	4^+		100		25			300	<3		3560	11888(2)	87Wa0A	74Na09	
3654.0(10)	1^-		20000		0.0						3563	11891(2)	87Wa0A		
3657.2(10)	2^-		1000								3566	11894(2)	87Wa0A		
3664.8(10)	1^+		700								3573	11901(2)	87Wa0A		
3679.7(10)	3^-		1000		4.0			30	5.5(5)		3588	11916(2)	87Wa0A	74Na09	
3688.6(10)	2^+		2200	2200	2						3596	11925(2)	90Bu02	87Wa0A	
3694.2(10)	4^+		30		1.5						3602	11930(2)	87Wa0A		
3697.5(10)	1^-		16000		74			130	6.9(5)		3605	11933(2)	87Wa0A	74Na09	
3699.3(10)	1^+		800								3607	11935(2)	87Wa0A		

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_pp [keV]	$S_{\mathrm{p}\gamma}$ [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ [keV]	$(2J{+}1)\theta_\mathrm{p}^2$ [keV]	E_cm [keV]	E^* [keV]	Ref.		
3701.6(10)	2^-		600								3609	11937(2)	87Wa0A		
3704.8(10)	1^+		400								3612	11940(2)	87Wa0A		
3707.3(10)	3^-		480		9			160	<3		3615	11943(2)	87Wa0A	74Na09	
3709.5(10)	1^-		400		8						3617	11945(2)	87Wa0A		
3713.0(10)	0^+		300		10			50	<3		3620	11948(2)	87Wa0A	74Na09	
3723.6(10)	2^+		1000		5						3630	11959(2)	87Wa0A		
3727.9(10)	0^+		300		6			80	3.5(5)		3635	11963(2)	87Wa0A	74Na09	
3735.0(10)	1^+		800								3642	11970(2)	87Wa0A		
3736.2(10)	2^+		240	240	13			140	<3		3643	11971(2)	90Bu02	87Wa0A	74Na09
3740.4(10)	1^-		40		15			50	<3		3647	11975(2)	87Wa0A	74Na09	
3748.8(10)	2^-		1600								3655	11983(2)	87Wa0A		
3752.7(10)	3^-		300		80			400	<3		3659	11987(2)	87Wa0A	74Na09	
3759.8(10)	0^-		3000					80	4.0(5)		3666	11994(2)	87Wa0A	74Na09	
3767.3(10)	2^+		1000		20			180	4.7(5)		3673	12001(2)	87Wa0A	74Na09	
3773.5(10)	1^+		550								3679	12007(2)	87Wa0A		
3776.6(10)	2^-		6000								3682	12010(2)	87Wa0A		
3778.5(10)	4^+		10		0.6			50	<3		3684	12012(2)	87Wa0A	74Na09	
3790.2(10)	1^+		900								3695	12024(2)	87Wa0A		
3793.5(10)	4^+		200		18			270	<3		3699	12027(2)	87Wa0A	74Na09	
3800.6(10)	3^-		300		5						3706	12034(2)	87Wa0A	85Se16	
3814.9(10)	2^+		2500		150			580	4.7(5)		3719	12048(2)	87Wa0A	74Na09	85Se16
3823.8(10)	1^-		2000		0.0						3728	12056(2)	87Wa0A		
3826.4(10)	2^+		1100		100						3731	12059(2)	87Wa0A		
3835.0(10)	2^+		1000		150			270	4.3(5)		3739	12067(2)	87Wa0A	74Na09	85Se16
3835.5(10)	2^+		1100		100						3740	12068(2)	87Wa0A		
3844.7(10)	1^-		3000		70			1230	<3		3749	12077(2)	87Wa0A	74Na09	85Se16
3850.1(10)	4^+		20		1.0			150	4.1(5)		3754	12082(2)	87Wa0A	74Na09	
3854.3(10)	4^+		10		1.0			210	4.3(5)		3758	12086(2)	87Wa0A	74Na09	
3857.0(10)	2^-		10000								3761	12089(2)	87Wa0A		
3858.0(10)	2^+		4200		200						3762	12090(2)	87Wa0A		
3861.4(10)	4^+		30		30						3765	12093(2)	87Wa0A		
3863.5(10)	2^+		9000		400			2020	5.8(5)		3767	12095(2)	87Wa0A	74Na09	
3874.7(10)	4^+		50		40			480	3.5(5)		3778	12106(2)	87Wa0A	74Na09	
3879.5(10)	2^+		2000		0.0						3783	12111(2)	87Wa0A		
3884.0(10)	3^-		600		180			1010	<3		3787	12115(2)	87Wa0A	74Na09	
3895.1(10)	3^+		1000								3798	12126(2)	87Wa0A		
3902.1(10)	4^+		60		70						3804	12133(2)	87Wa0A		
3904.3(10)	4^+		100		3.0			780	<3		3807	12135(2)	87Wa0A	74Na09	
3910.8(10)	2^+		2000	1000	240			1020	4.0(5)		3813	12141(2)	90Bu02	87Wa0A	74Na09
3922.2(10)	4^+		330		25			390	3.5(5)		3824	12152(2)	87Wa0A	74Na09	
3927.8(10)	4^+		80		40			400	4.0(5)		3830	12158(2)	87Wa0A	74Na09	
3929.5(10)	4^+		80		3.0						3831	12160(2)	87Wa0A		
3948.2(10)	1^-		200		20						3849	12178(2)	87Wa0A		
3950.8(10)	2^+		1400		100			430	$\langle 3 \rangle$		3852	12180(2)	87Wa0A	74Na09	
3955.2(10)	2^-		2000								3856	12185(2)	87Wa0A		

(continued) **$^{40}_{20}$Ca(p)**

$E_\circ$ [keV]	J^π	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_{pp} [keV]	$S_{p\gamma}$ [eV]	$S_{p\alpha_\circ}$ [eV]	Γ [keV]	$(2J+1)\theta_p^2$ [keV]	E_{cm} [keV]	E^* [keV]	Ref.		
3963.6(10)	2^+	1000	1000	240						3864	12193(2)	90Bu02	87Wa0A	
3967.3(10)	1^-	800		150			1120	4.0(5)		3868	12196(2)	87Wa0A	74Na09	
3972.3(10)	3^-	2000		80			550	3.5(5)		3873	12201(2)	87Wa0A	74Na09	
3980.6(10)	0^-	1000								3881	12209(2)	87Wa0A		
3983.3(10)	4^+	20		9			140	$\langle 3 \rangle$		3884	12212(2)	87Wa0A	74Na09	
3989.2(10)	1^+	1500								3889	12218(2)	87Wa0A		
3996.0(10)	1^-	1400		60						3896	12224(2)	87Wa0A		
3998.2(10)	2^+	430	425	9			1430	3.5(5)		3898	12227(2)	90Bu02	87Wa0A	74Na09
4009.8(10)	1^+	2000								3910	12238(2)	87Wa0A		
4016.2(10)	4^+	20		10						3916	12244(2)	87Wa0A		
4017.5(10)	1^-	1000		1000			1800	4.0(5)		3917	12245(2)	87Wa0A	74Na09	
4029(4)							510	5.5(5)		3928	12257(4)	74Na09		
4043(4)	$\langle 2^+ \rangle$						4270	5.8(5)		3942	12270(4)	74Na09		
4053(4)							1100	4.2(5)		3952	12280(4)	74Na09		
4066(4)							720	4.0(5)		3964	12293(4)	74Na09		
4073(4)	$\langle 2^+ \rangle$						920	4.0(5)		3971	12299(4)	74Na09		
4079(4)	$\langle 1^- \rangle$						3090	6.7(5)		3977	12305(4)	74Na09		
4106(4)	2^+						7360	7.3(5)		4003	12332(4)	74Na09		
4123(4)							3080	6.0(5)		4020	12348(4)	74Na09		
4132(4)	$\langle 3^-,1^- \rangle$						2650	5.5(5)		4029	12357(4)	74Na09		
4143(4)							1530	6.7(5)		4039	12368(4)	74Na09		
4152(4)							1090	5.9(5)		4048	12376(4)	74Na09		
4157(4)							340	4.0(5)		4053	12381(4)	74Na09		
4175(4)	$\langle 2^+,1^- \rangle$						5220	6.7(5)		4071	12399(4)	74Na09		
4182(4)							3080	3.5(5)		4077	12406(4)	74Na09		
4188(4)							2410	4.0(5)		4083	12412(4)	74Na09		
4195(4)							3040	5.4(5)		4090	12418(4)	74Na09		
4202(4)							3930	6.4(5)		4097	12425(4)	74Na09		
4353										4250	12578	70He08		
4431										4326	12654	70He08		
4451										4546	12874	70He08		
4639										4520	12848	70He08		
4729						11.9				4616	12944	73Wa08	70He08	
4862								$\langle 30.7 \rangle$		4746	13074	70He08		
4949						$\langle 32.5 \rangle$		$\langle 11.7 \rangle$		4831	13159	73Wa08	70He08	
5050						15.7		9.3		4917	13245	73Wa08	70He08	
5122						6.8				4999	13327	70He08		
5245						6.6				5114	13442	73Wa08	70He08	
5596						6.6				5456	13784	73Wa08	70He08	
5682						20.8		$\langle 23 \rangle$		5540	13868	73Wa08	70He08	
5772						44.6		24		5628	13956	73Wa08	70He08	
5899						28.4				5752	14080	73Wa08	70He08	
9479										9242	17570	73Wa08	73Di02	
9684										9442	17770	73Wa08	73Di02	
10084										9832	18160	73Wa08	73Di02	

(continued) $^{40}_{20}$Ca(p)

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	Γ_p [eV]	Γ_α [eV]	S_{pp} [keV]	$S_{p\gamma}$ [eV]	$S_{p\alpha_\circ}$ [eV]	Γ [keV]	$(2J+1)\theta_p^2$ [keV]	E_{cm} [keV]	E^* [keV]	Ref.	
10217											9962	18290	73Wa08	73Di02
10381											10122	18450	73Wa08	73Di02
10627											10362	18690	73Wa08	73Di02
11017											10742	19070	73Wa08	73Di02

Additional data on this isotope can be found in [00Ha06, 90Bu02, 90Ki07, 89Bu0A, 88Al16, 87He05, 85Se16, 83Sh33, 73Di02, 70He08, 69Ve04, 68Ba22, 68Li12, 67Le12, 66En04, 64Ta05, 63Si13, 62Ra07, 61Ec03, 61Zi01, 57To0A].

Γ_p from [87Wa0A] and [90Bu02] are given in the first and the second columns, respectively.

Data for 30 resonances with $J^\pi=2^+$ in [87Wa0A] are considered as superseded by data in [90Bu02]; Γ_p from both works given in the separate columns of Supplement are proximate to each other; the single marked discrepancy exists between Γ_α [87Wa0A, 90Bu02] for resonance at $E_\circ$=3998 keV.

E^*>12900 keV and $S_{p\gamma_\circ}$ are given in [73Wa08] with reference on [70He08] and [73Di02].

Several states studied in (p,γ) reaction were observed also by delayed protons following the beta decay of ^{40}Sc [69Ve04].

Excited states in the compound nucleus ^{36}Ca have not been observed but the contribution of the known state at E^*=3260 keV as a resonance at E_{cm}=700 keV was taken into account in [01Il02] by estimated value $\omega\gamma_{cm}$=3.6 meV.

$\omega\gamma_{cm}$=1.79(19) eV [79Pa16] for resonance at 2042 keV was recommended as a standard [01Il02].

Parameters of resonance proton scattering [87Wa0A]. $^{40}_{20}$Ca(p)

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{p_1\ell}$ [keV$^{1/2}$]	$\gamma_{p_2\ell}$ [keV$^{1/2}$]	$\gamma_{p_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{p_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_{cm} [keV]	E^* [keV]
1919.3(4)	1^-	1.6	0.5	0	0	4.9	4.9		0.0	0.0	0.0	1871	10199.1
1997.0(3)	1^-	1.6	1.0		0	0.0	6.1		0.0	0.0	0.0	1947	10274.9
2057.1(15)	3^-	0.11	1.0		0		1.5	0.0	0.0	1.0	3.9	2005	10333.5
2086.8(15)	1^-	0.60	0.8	0	0	1.3	3.0		0.0	3.0	2.5	2034	10362.4
2088.8	1^-	1.1	0.5	0	0	–3.2	3.0		0.0	5.0	3.2	2036	10364.4
2101.1(15)	1^-	0.60	0.8	0	0	1.3	3.0		0.0	2.0	1.9	2048	10376.4
2145.8(10)	1^-	0.50	0.8	0	0	1.2	2.5		0.0	2.8	2.1	2092	10419.9
2169.6(10)	2^-	4.0	0.3	0	0	6.6	3.8	0.0	0.0			2115	10443.1
2173.1(10)	1^-	0.15	1.0		0	0.0	1.5		0.0	1.0	1.2	2118	10446.5
2244.4(15)	1^-	1.2	0.0	0		3.8	0.0		0.0	10	3.1	2188	10516.1
2245.3(10)	1^+	0.30	0.0	0		–1.1		+0.0	+0.0			2189	10516.9
2258.0(15)	1^+	0.40	0.0	90		0.0		4.9	0.0			2201	10529.3
2270.3(15)	0^+	0.16	1.0		90				3.0	25	3.9	2213	10541.3
2326.4(10)	3^-	0.15	1.0		0		1.2	0.0	0.0	5.0	4.7	2268	10596.0
2328.6(10)	1^+	0.20	0.0	90		0.0		3.2	0.0			2270	10598.1
2337.8(10)	0^+	0.20	1.0		90				3.1	0.0	0.0	2279	10607.1
2349.3(10)	2^-	3.5	0.5	0	0	4.2	4.0	0.0	0.0			2290	10618.3
2352.2(10)	0^+	0.03	1.0		90				1.2	8.0	1.9	2293	10621.1

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{\mathrm{p}_1\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_cm [keV]	E^* [keV]
2364.04	1^-	1.1	0.9	0	0	0.96	3.0		0.0	1.5	0.94	2304	10632.67
2385.14	1^-	0.59	1.0		0	0.0	2.3		0.0	5.0	1.6	2325	10653.24
2389.1(10)	2^+	0.44	1.0		–17		–1.1	0.0	1.3	3.5	2.0	2329	10657.1
2398.4(10)	2^-	2.0	1.0		0	0.0	4.1	0.0	0.0			2338	10666.2
2407.6(10)	1^-	1.5	0.2	0	–14	3.2	–1.4		2.8	60	5.5	2347	10675.1
2425.5(10)	1^+	1.1	0.0	25		1.8		2.8	0.0			2364	10692.6
2433.7(10)	0^+	0.60	1.0		90				4.8	1.0	0.56	2372	10700.6
2455.5(10)	1^+	1.1	0.1	18	90	1.8		1.9	1.9			2394	10721.8
2473.9(10)	1^-	2.2	0.3	0	0	3.4	2.1		0.0	6.0	1.5	2412	10739.8
2482.9(10)	0^+	1.0	1.0		90				3.2	10	1.6	2420	10748.5
2506.8(10)	1^+	0.05	0.0	0		0.40		0.0	0.0			2444	10771.8
2513.0(10)	2^+	0.8	0.8	90	90		0.0	1.1	2.1	5.5	1.9	2450	10777.9
2515.4(10)	1^-	1.6	1.0		–14	0.0	3.2		–5.5	10	1.8	2452	10780.2
2518.0(10)	0^-	0.70	0.0	0		2.2						2455	10782.8
2538.1(10)	0^+	0.50	1.0		90				3.9	200	6.4	2474	10802.3
2552.0(10)	2^-	6.0	0.1	0	0	5.7	2.2	0.0	0.0			2488	10815.9
2552.2(10)	3^+	0.50	0.0	0		3.8	0.0	0.0	0.0			2488	10816.1
2569.2(10)	3^-	0.025	1.0		–38		+0.30	+0.0	–1.5	0.9	+1.2	2504	10832.7
2585.8(4)	2^-	11	0.2	0	0	7.2	3.6	0.0	0.0			2521	10848.8
2588.7(10)	2^-	2.5	1.0		0	0.0	3.8	0.0	0.0			2523	10851.7
2598.2(10)	2^+	0.06	0.8	90	–29		–0.30	0.56	0.56	2.0	0.99	2533	10860.9
2606.0(4)	1^-	26	0.5	0	0	+8.6	+8.6		+0.0	70	+4.0	2540	10868.5
2606.7(10)	0^+	0.40	1.0		90				3.2	0.0	0.0	2541	10869.2
2611.0(10)	1^-	4.0	1.0		0	0.0	4.7		0.0	0.0	0.0	2545	10873.4
2637.0(10)	1^+	0.41	0.1	24	90	0.87		1.2	1.2			2571	10898.8
2652.9(20)	1^-	5.0	0.5	0	0	+3.5	+3.8		+0.0	40	–2.7	2586	10914.3
2653.9(10)	1^+	0.70	1.0		90	0.0		0.0	4.0			2587	10915.2
2671.3(10)	1^-	2.0	0.9	0	0	+1.0	+3.0		+0.0	8	–1.1	2604	10932.2
2685.8(10)	2^+	0.15	0.8	90	0		0.53	0.81	0.0	8	1.7	2618	10946.3
2689.9(10)	2^-	7.0	1.0		0	0.0	5.9	0.0	0.0			2622	10950.3
2692.7(10)	0^+	0.20	1.0		90				2.1	20	1.5	2625	10953.0
2728.7(4)	2^-	9.0	0.5	0	0	4.5	4.5	0.0	0.0			2660	10988.1
2729.4(10)	1^+	0.40	1.0		90	0.0		0.0	2.8			2661	10988.8
2739.2(20)	3^-	0.20	1.0		0		0.95	0.0	0.0	2.0	1.3	2670	10998.4
2740.6(20)	3^-	0.20	1.0		0		0.95	0.0	0.0	0.8	0.81	2671	10999.7
2747.7(20)	1^-	5.0	0.2	0	0	4.2	2.1		0.0	10	1.2	2678	11006.7
2764.6(10)	1^-	1.0	1.0		0	+0.0	+2.1		+0.0	10	–1.1	2695	11023.1
2765.1(10)	3^-	0.10	1.0		0		+0.66	+0.0	+0.0	12	+3.0	2695	11023.6
2777.5(10)	1^+	0.10	0.0	0		0.46		0.0	0.0			2707	11035.7
2785.9(10)	2^+	0.50	1.0		18		0.96	0.0	0.94	0.8	0.45	2716	11043.9
2815.7(10)	2^+	0.66	1.0		18		1.1	0.0	1.0	0.6	0.37	2745	11072.9
2820.7(10)	1^-	1.2	0.8	0	0	0.89	2.0		0.0	4.0	0.66	2750	11077.8
2826.1(10)	1^+	0.35	1.0		90	0.0		0.0	2.4			2755	11083.1
2831.9(10)	0^+	0.10	1.0		90				1.3	6.0	0.67	2760	11088.7
2850.1(10)	1^-	3.9	0.2	0	0	3.4	1.6		0.0	0.0	0.0	2778	11106.5

(continued) $^{40}_{20}\mathbf{Ca}$(p)

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{\mathrm{p}_1\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_cm [keV]	E^* [keV]
2862.3(10)	0^+	0.10	1.0		90				1.2	32	1.5	2790	11118.4
2872.7(10)	4^+	0.11	1.0		0		1.3	0.0	0.0	1.4	1.7	2800	11128.5
2889.2(10)	1^-	0.20	1.0		0	0.0	0.84		0.0	2.0	0.42	2816	11144.6
2889.8(10)	1^+	0.20	0.2	0	90	0.54		0.0	0.76			2817	11145.2
2901.5(10)	2^-	48	0.5	0	0	9.2	9.2	0.0	0.0			2828	11156.6
2905.9(10)	4^+	0.04	1.0		0		0.75	0.0	0.0	0.8	1.2	2833	11160.9
2907.4(10)	2^+	3.5	1.0		90		+0.0	+0.0	+7.0	0.0	0.0	2834	11162.3
2912.0(20)	4^+	0.08	1.0		0		1.1	0.0	0.0	3.0	2.3	2839	11166.8
2932.7(10)	3^-	1.4	0.9	90	0		2.0	3.9	0.0	1.6	0.82	2859	11187.0
2948.4(10)	2^-	6.0	0.1	0	0	–4.0	–1.6	+0.0	+0.0			2874	11202.3
2958.4(10)	3^-	2.8	1.0		11		2.9	0.0	3.2	1.4	0.73	2884	11212.0
2963.7(20)	4^+	1.4	1.0		0		–4.1	0.0	0.0	1.0	1.2	2889	11217.2
2977.6(20)	2^-	3.0	0.8	0	0	1.3	2.8	0.0	0.0			2903	11230.8
2993.4(10)	3^-	0.08	1.0		0		0.49	0.0	0.0	12	2.0	2918	11246.2
3002.8(10)	1^+	0.30	1.0		90	0.0		0.0	1.9			2927	11255.3
3007.8(10)	0^-	6.0	0.0	0		4.2						2932	11260.2
3011.4(10)	2^+	0.58	0.5	90	–70		0.22	–1.8	–1.6	25	–1.6	2935	11263.7
3032.0(10)	2^-	0.60	0.0	0		1.3	0.0	0.0	0.0			2956	11283.8
3037.5(10)	1^+	1.0	0.5	0	90	0.87		0.0	2.4			2961	11289.2
3048.3(10)	1^+	0.40	1.0		90	0.0		0.0	2.1			2971	11299.7
3050.6(10)	1^-	1.2	0.3	0	0	1.5	1.1		0.0	0.0	0.0	2974	11301.9
3068.5(10)	0^-	1.8	0.0	0		2.2						2991	11319.4
3070.5(10)	2^+	0.47	1.0		0		0.81	0.49	0.0	50	2.2	2993	11321.3
3079.5(10)	1^-	4.0	0.5	0	0	2.3	2.3		0.0	30	1.2	3002	11330.1
3087.7(10)	1^+	0.20	0.6	0	90	0.34		0.0	1.1			3010	11338.1
3091.7(10)	2^-	40	0.9	0	0	3.3	9.8	0.0	0.0			3014	11342.0
3095.6(10)	4^+	0.02	1.0		0		0.45	0.0	0.0	0.5	0.67	3018	11345.8
3100.8(10)	1^+	0.80	0.4	0	90	0.80		0.0	1.9			3023	11350.9
3112.0(10)	1^+	1.2	0.4	58	90	0.53		2.2	2.2			3034	11361.8
3115.7(10)	2^+	0.088	0.8	90	90		0.0	0.44	0.82	100	2.9	3037	11365.4
3116.7(10)	2^-	4.4	0.8	0	0	1.6	3.0	0.0	0.0			3038	11366.4
3118.0(10)	4^+	0.02	1.0		0		0.44	0.0	0.0	1.4	1.1	3039	11367.6
3121.2(10)	2^+	1.4	0.9	90	0		1.3	1.4	0.0	4.0	0.58	3043	11370.7
3132.2(10)	2^+	2.6	1.0		0		1.8	0.69	0.0	60	2.2	3053	11381.5
3143.4(10)	1^-	0.10	1.0		90	0.0	0.0		2.6	0.4	0.13	3064	11392.4
3154.9(10)	1^-	3.5	0.0	0		2.9	0.0		0.0	6.0	0.49	3075	11403.6
3157.7(10)	1^+	0.22	0.3	0	90	0.46		0.0	0.74			3078	11406.3
3165.7(10)	4^+	0.10	1.0		0		0.95	0.0	0.0	5.0	1.9	3086	11414.1
3171.4(10)	3^-	0.30	1.0		0		0.85	0.0	0.0	0.9	0.42	3091	11419.7
3184.1(10)	1^-	0.30	1.0		90	0.0	0.0		4.4	2.0	0.27	3104	11432.1
3188.3(10)	2^+	0.20	0.2	90	90		0.0	1.2	0.59	12	0.92	3108	11436.2
3199.0(10)	1^-	5.0	0.6	0	0	2.2	2.7		0.0	340	3.5	3118	11446.6
3203.3(10)	1^+	0.60	0.0	40		0.67		1.5	0.0			3123	11450.8
3207.4(10)	3^-	0.05	0.6	90	90		0.0	1.1	1.4	10	1.3	3127	11454.8
3212.5(10)	2^+	1.0	1.0		27		1.0	0.50	1.3	150	3.1	3132	11459.7

(continued) $^{40}_{20}\mathbf{Ca}$(p)

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{\mathrm{p}_1\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_cm [keV]	E^* [keV]
3217.3(10)	2^+	0.026	1.0		27		0.16	0.077	0.21	100	–2.4	3136	11464.4
3221.0(10)	2^-	0.40	1.0		0	0.0	0.96	0.0	0.0			3140	11468.0
3232.4(10)	1^+	0.30	1.0		90	0.0		0.0	1.6			3151	11479.1
3239.5(10)	0^+	0.10	1.0		90				0.90	6.0	0.37	3158	11486.1
3242.5(10)	1^+	0.40	1.0		90	0.0		0.0	1.8			3161	11489.0
3268.1(10)	2^+	0.50	0.7	90	0		0.65	1.1	0.0	100	2.4	3186	11513.9
3268.7(10)	1^-	4.2	1.0		0	+0.66	+2.9		+0.0	30	+0.93	3186	11514.5
3272.6(10)	2^+	0.70	0.0	90			0.0	2.3	0.0	0.0	0.0	3190	11518.3
3292.0(10)	2^-	8.0	1.0		0	0.0	4.1	0.0	0.0			3209	11537.2
3296.4(10)	2^+	0.60	0.9	90	30		+0.68	+0.71	+1.00	17	–0.93	3213	11541.5
3297.9(10)	1^+	0.90	0.0	0		1.0		0.0	0.0			3215	11543.0
3301.0(10)	2^-	18	0.0	0		6.1	0.0	0.0	0.0			3218	11546.0
3309.0(10)	1^-	35	0.7	0	0	+4.5	+7.2		+0.0	600	–3.9	3226	11553.8
3313.7(10)	2^+	0.40	0.0	90			0.0	1.7	0.0	0.0	0.0	3230	11558.4
3318.3(10)	2^-	0.40	0.0	0		0.90	0.0	0.0	0.0			3235	11562.9
3333.0(10)	2^-	1.0	1.0		0	0.0	1.4	0.0	0.0			3249	11577.2
3333.1(10)	2^+	0.18	1.0		48		0.30	0.0	0.84	40	1.4	3249	11577.3
3340.9(10)	2^-	0.15	1.0		55	0.0	0.32	0.0	2.2			3257	11584.9
3352.8(10)	2^+	0.30	0.0	90			0.0	1.4	0.0	0.0	0.0	3268	11596.5
3358.0(10)	2^+	0.30	0.0	90			0.0	1.4	0.0	0.0	0.0	3273	11601.6
3359.1(10)	2^+	0.25	0.6	90	–61		–0.17	0.87	0.87	30	1.1	3274	11602.6
3361.1(10)	1^-	12	0.9	0	0	+1.4	+4.6		+0.0	1000	+4.8	3276	11604.6
3367.1(10)	1^-	0.70	1.0		0	+0.0	+1.2		+0.0	160	+1.9	3282	11610.4
3370.0(10)	2^-	0.50	0.0	0		0.98	0.0	0.0	0.0			3285	11613.3
3384.9(10)	3^+	0.70	0.0	0		2.1	0.0	0.0	0.0			3300	11627.8
3385.2(10)	2^+	0.80	0.9	90	45		0.62	0.72	1.5	10	0.64	3300	11628.1
3394.8(10)	1^-	0.08	1.0		–44	+0.0	+0.27		–1.2	10	+0.46	3309	11637.4
3401.8(10)	2^-	0.60	0.0	0		1.1	0.0	0.0	0.0			3316	11644.3
3403.7(10)	2^+	0.20	0.0	90			0.0	1.1	0.0	2.0	0.28	3318	11646.1
3407.8(10)	2^+	0.10	0.7	90	68		0.10	0.44	0.62	80	1.7	3322	11650.1
3410.4(10)	2^+	1.8	1.0		0		1.4	0.0	0.0	110	2.0	3324	11652.7
3419.0(10)	1^-	0.06	0.7	0	0	0.19	0.27		0.0	1500	5.4	3333	11661.0
3430.4(10)	2^-	0.20	0.0	90		0.0	0.0	2.9	0.0			3344	11672.1
3434.7(10)	2^+	0.18	1.0		19		+0.41	+0.0	+0.35	600	+4.6	3348	11676.3
3445.4(10)	1^+	0.50	1.0		90	0.0		0.0	1.7			3359	11686.8
3447.2(10)	2^-	0.60	0.9	90	–15	0.0	–0.93	1.6	1.3			3360	11688.5
3450.9(10)	4^+	0.012	1.0		0		0.27	0.0	0.0	9.0	1.6	3364	11692.1
3454.5(10)	0^-	0.60	0.0	0		1.0						3367	11695.6
3461.9(10)	0^+	4.5	1.0		90				5.2	150	1.4	3375	11702.9
3463.0(10)	2^-	3.0	1.0		0	0.0	–2.2	0.0	0.0			3376	11703.9
3466.3(10)	1^-	0.30	0.7	0	0	0.42	0.59		0.0	2.0	0.19	3379	11707.1
3472.2(10)	1^+	0.20	1.0		90	0.0		0.0	1.1			3385	11712.9
3474.4(10)	2^-	1.5	1.0		0	0.0	1.6	0.0	0.0			3387	11715.0
3480.0(10)	1^+	1.5	1.0		90	0.0		0.0	2.9			3392	11720.5
3483.8(10)	3^-	0.05	0.6	90	0		0.23	0.87	0.0	10	0.89	3396	11724.2

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{\mathrm{p}_1\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_cm [keV]	E^* [keV]
3490.4(10)	1^-	0.64	0.3	0	–14	0.87	–0.54		0.69	3000	7.0	3402	11730.6
3490.5(10)	1^+	0.40	0.0	90		0.0		1.5	0.0			3402	11730.7
3498.2(10)	2^-	3.0	0.0	0		2.2	0.0	0.0	0.0			3410	11738.2
3502.2(10)	2^+	0.24	1.0		0		0.48	0.0	0.0	600	4.2	3414	11742.1
3504.8(10)	2^+	0.05	1.0		30		+0.19	+0.0	+0.26	500	–3.8	3416	11744.7
3509.7(10)	1^-	0.70	0.2	0	0	+0.95	+0.52		+0.0	2500	–6.2	3421	11749.4
3513.7(10)	1^-	0.30	1.0		55	0.0	0.41		2.7	50	0.88	3425	11753.3
3517.4(10)	1^+	0.60	0.7	0	90	0.44		0.0	1.5			3429	11757.0
3528.2(10)	2^-	15	0.5	0	19	3.4	3.4	0.0	5.3			3439	11767.5
3543.5(10)	3^-	0.021	0.4	90	90		0.0	0.67	0.52	20	1.2	3454	11782.4
3549.1(10)	2^+	3.0	0.9	90	10		+1.5	+1.5	+0.64	440	–3.3	3460	11787.9
3553.5(10)	1^+	0.46	0.0	69		0.24		1.4	0.0			3464	11792.1
3560.2(10)	4^+	0.01	1.0		0		0.23	0.0	0.0	170	6.1	3470	11798.7
3565.3(10)	0^+	0.06	1.0		90				0.56	200	1.4	3475	11803.6
3570.2(10)	1^+	1.1	0.0	65		0.43		2.1	0.0			3480	11808.4
3572.0(10)	2^+	1.3	0.9	90	68		0.38	0.90	2.2	600	3.9	3482	11810.2
3572.7(10)	3^-	0.26	0.8	90	0		0.56	1.4	0.0	2.0	0.36	3483	11810.9
3581.9(10)	1^-	3.5	0.4	0	37	+1.8	+1.2		+4.0	30	–0.62	3492	11819.8
3592.4(10)	1^-	0.094	0.5	0	–71	+0.28	+0.078		–1.0	140	–1.2	3502	11830.1
3601.0(10)	0^+	1.0	1.0		90				2.2	50	0.68	3510	11838.4
3606.0(10)	1^+	0.78	0.8	45	90	0.27		0.63	1.7			3515	11843.3
3618.0(10)	2^+	0.58	1.0		–21		+0.67	+0.0	–0.61	60	+1.2	3527	11855.0
3619.6(10)	1^+	1.3	0.4	52	90	0.52		1.6	1.6			3528	11856.6
3625.7(10)	3^-	0.41	1.0		–30		+0.67	+0.0	–1.7	8	–0.65	3534	11862.5
3627.2(10)	0^+	1.6	1.0		90				2.8	0.0	0.0	3536	11864.0
3631.4(10)	4^+	0.03	1.0		0		0.38	0.0	0.0	2.0	0.60	3540	11868.1
3632.6(10)	2^+	0.01	1.0		45		0.066	0.0	0.15	30	0.81	3541	11869.2
3634.9(10)	2^+	0.30	1.0		0		+0.51	+0.0	+0.0	250	+2.3	3543	11871.5
3640.8(10)	1^-	0.30	1.0		–17	+0.0	–0.62		+0.94	15	–0.41	3549	11877.2
3647.5(10)	1^+	0.80	1.0		90	0.0		0.0	1.9			3556	11883.8
3651.4(10)	4^+	0.10	0.9	90	–44		–0.44	2.0	3.7	25	2.1	3559	11887.6
3654.0(10)	1^-	20	1.0		0	+0.0	–5.3		+0.0	0.0	0.0	3562	11890.1
3657.2(10)	2^-	1.0	0.2	0	90	1.1	0.0	0.0	2.4			3565	11893.2
3664.8(10)	1^+	0.70	0.0	68		0.29		1.7	0.0			3572	11900.6
3679.7(10)	3^-	1.0	0.8	90	0		1.1	2.4	0.0	4.0	0.44	3587	11915.2
3688.6(10)	2^+	2.2	0.9	90	21		1.2	1.1	1.1	2.4	0.21	3596	11923.8
3694.2(10)	4^+	0.03	1.0		0		0.36	0.0	0.0	1.5	0.48	3601	11929.3
3697.5(10)	1^-	16	0.5	0	0	+3.3	+3.3		+0.0	74	+0.87	3604	11932.5
3699.3(10)	1^+	0.80	0.5	0	90	0.58		0.0	1.3			3606	11934.3
3701.6(10)	2^-	0.60	1.0		0	0.0	0.91	0.0	0.0			3608	11936.5
3704.8(10)	1^+	0.40	1.0		90	0.0		0.0	1.3			3611	11939.6
3707.3(10)	3^-	0.48	1.0		–23		+0.74	+0.0	–1.4	9	+0.64	3614	11942.1
3709.5(10)	1^-	0.40	0.8	0	90	+0.33	+0.0		+2.9	8	+0.28	3616	11944.2
3713.0(10)	0^+	0.30	1.0		90				+1.1	10	–0.26	3619	11947.6
3723.6(10)	2^+	1.0	0.8	90	–29		–0.69	0.92	0.92	5	0.30	3630	11958.0

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{\mathrm{p}_1\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_cm [keV]	E^* [keV]
3727.9(10)	0^+	0.30	1.0		90				+1.1	6	–0.20	3634	11962.1
3735.0(10)	1^+	0.80	0.0	90		0.0		1.8	0.0			3641	11969.1
3736.2(10)	2^+	0.24	0.6	90	–39		–0.25	0.66	0.48	30	0.72	3642	11970.2
3740.4(10)	1^-	0.04	1.0		–71	0.0	–0.072		0.85	15	0.37	3646	11974.3
3748.8(10)	2^-	1.6	1.0		0	0.0	1.5	0.0	0.0			3654	11982.5
3752.7(10)	3^-	0.30	0.6	90	0		0.49	1.7	0.0	80	1.8	3658	11986.3
3759.8(10)	0^-	3.0	0.0	0		2.0						3665	11993.2
3767.3(10)	2^+	1.0	0.2	90	0		0.40	1.8	0.0	20	0.56	3672	12000.6
3773.5(10)	1^+	0.55	0.9	0	90	0.20		0.0	1.4			3678	12006.6
3776.6(10)	2^-	6.0	1.0		0	0.0	–2.7	0.0	0.0			3681	12009.6
3778.5(10)	4^+	0.01	1.0		0		0.20	0.0	0.0	0.6	0.27	3683	12011.5
3790.2(10)	1^+	0.90	1.0		90	0.0		0.0	1.9			3695	12022.9
3793.5(10)	4^+	0.20	1.0		15		0.85	0.0	1.8	18	1.5	3698	12026.1
3800.6(10)	3^-	0.30	1.0		0		0.62	0.0	0.0	5	0.42	3705	12033.0
3814.9(10)	2^+	2.5	0.8	90	–29		–1.0	1.4	1.4	150	1.5	3719	12047.0
3823.8(10)	1^-	2.0	1.0		0	0.0	1.6		0.0	0.0	0.0	3727	12055.6
3826.4(10)	2^+	1.1	0.7	90	39		0.61	1.1	1.1	100	1.2	3730	12058.2
3835.0(10)	2^+	1.0	0.9	90	–14		–0.79	0.61	0.47	150	1.4	3738	12066.5
3835.5(10)	2^+	1.1	0.6	90	–66		–0.27	1.2	1.4	100	1.2	3739	12067.0
3844.7(10)	1^-	3.0	0.2	0	0	1.7	0.86		0.0	70	0.72	3748	12076.0
3850.1(10)	4^+	0.02	1.0		0		0.27	0.0	0.0	1.0	0.32	3753	12081.3
3854.3(10)	4^+	0.01	1.0		0		0.19	0.0	0.0	1.0	0.32	3757	12085.4
3857.0(10)	2^-	10	0.2	0	0	3.1	1.6	0.0	0.0			3760	12088.0
3858.0(10)	2^+	4.2	1.0		–31		1.5	0.0	–2.0	200	1.6	3761	12089.0
3861.4(10)	4^+	0.03	1.0		0		+0.33	+0.0	+0.0	30	–1.6	3764	12092.3
3863.5(10)	2^+	9.0	0.9	90	60		1.2	1.9	4.7	400	2.3	3766	12094.3
3874.7(10)	4^+	0.05	0.9	90	–29		–0.34	1.0	1.5	40	2.0	3777	12105.2
3879.5(10)	2^+	2.0	0.0	90			0.0	2.7	0.0	0.0	0.0	3782	12109.9
3884.0(10)	3^-	0.60	0.8	90	90		+0.0	+1.6	+3.1	180	+2.3	3786	12114.3
3895.1(10)	3^+	1.0	0.5	0	0	1.3	1.3	0.0	0.0			3797	12125.1
3902.1(10)	4^+	0.06	1.0		–29		–0.39	+0.0	+1.7	70	–2.4	3804	12132.0
3904.3(10)	4^+	0.10	1.0		–29		–0.50	0.0	2.3	3.0	0.52	3806	12134.1
3910.8(10)	2^+	2.0	0.9	90	0		+1.1	+0.83	+0.0	300	–1.8	3812	12140.4
3922.2(10)	4^+	0.33	1.0		–28		–0.91	0.0	4.0	25	1.5	3823	12151.5
3927.8(10)	4^+	0.08	1.0		–29		–0.44	0.0	2.0	40	1.9	3829	12157.0
3929.5(10)	4^+	0.08	1.0		30		0.45	0.0	2.0	3.0	0.51	3830	12158.7
3948.2(10)	1^-	0.20	0.6	0	30	0.30	0.32		0.75	20	0.35	3849	12176.9
3950.8(10)	2^+	1.4	0.4	90	90		0.0	1.7	1.4	100	1.0	3851	12179.4
3955.2(10)	2^-	2.0	1.0		0	0.0	1.5	0.0	0.0			3855	12183.7
3963.6(10)	2^+	1.0	0.8	90	0		0.75	0.81	0.0	200	1.4	3864	12191.9
3967.3(10)	1^-	0.80	1.0		45	0.0	0.67		2.7	150	0.94	3867	12195.5
3972.3(10)	3^-	2.0	0.8	90	0		1.3	2.7	0.0	80	1.4	3872	12200.4
3980.6(10)	0^-	1.0	0.0	0		1.1						3880	12208.5
3983.3(10)	4^+	0.02	1.0		0		0.25	0.0	0.0	9	0.82	3883	12211.1
3989.2(10)	1^+	1.5	1.0		90	0.0		0.0	2.2			3889	12216.9

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	Γ_p [keV]	ξ	ψ	ψ	$\gamma_{\mathrm{p}_1\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_1\ell+2}$ [keV$^{1/2}$]	$\gamma_{\mathrm{p}_2\ell+2}$ [keV$^{1/2}$]	Γ_α [eV]	γ_α [keV$^{1/2}$]	E_cm [keV]	E^* [keV]
3996.0(10)	1^-	1.4	0.5	0	0	+0.88	+0.88		+0.0	60	–0.57	3895	12223.5
3998.2(10)	2^+	0.20	1.0		45		+0.26	+0.0	+0.56	2500	–4.8	3897	12225.6
4009.8(10)	1^+	2.0	0.3	0	90	1.0		0.0	1.2			3909	12236.9
4016.2(10)	4^+	0.02	1.0		0		0.25	0.0	0.0	10	0.83	3915	12243.2
4017.5(10)	1^-	1.0	0.4	0	0	0.80	0.66		0.0	1000	2.3	3916	12244.4

Values $E_\circ$, J^π, Γ_p and Γ_α are considered as fairly reliable while additional parameters from [87Wa0A] including mixing parameters are given only in Supplement.
Three reaction channels (spin s, orbital momentum l) were considered: p_o, p_1 and α_o.
Mixing parameters ξ and ψ as well as scattering amplitudes $\gamma_{\mathrm{p}_1\ell}$, $\gamma_{\mathrm{p}_2\ell}$, $\gamma_{\mathrm{p}_1\ell+2}$, $\gamma_{\mathrm{p}_2\ell+2}$ (from [87Wa0A]) are fitting parameters to estimate the results of angular distribution measurements.

Proton partial reduced widths for 2^+ resonances [90Bu02, 89Bu0A]. $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	Γ_p [eV]	γ^2_p [keV]	Γ_α [eV]	γ^2_α [keV]	γ^2_{20} [keV]	γ^2_{12} [keV]	γ^2_{22} [keV]	$\gamma_{20}\gamma_{22}$ [keV]	E_cm [keV]	E^* [keV]
2389.1	350	1.87	4	4.02	1.31	0.56	0.00	0.08	2329	10658
2513.0	180	5.64	4	2.99	0.01	1.26	4.37	0.23	2450	10778
2598.2	40	0.30	5	2.45	0.09	0.08	0.13	–0.11	2533	10862
2685.8	215	0.75	11	4.01	0.48	0.26	0.02	–0.09	2619	10947
2785.9	500	1.35	2	0.50	0.99	0.00	0.37	–0.60	2716	11045
2862.3	40	0.48	6	1.08	0.02	0.28	0.18	0.06	2791	11119
3011.4	325	3.71	16	1.95	0.02	2.36	1.33	0.15	2936	11264
3070.5	475	0.90	41	4.13	0.65	0.24	0.01	0.06	2994	11322
3115.7	90	0.83	100	8.80	0.01	0.18	0.65	0.06	3038	11366
3132.2	2500	4.22	65	5.43	3.27	0.61	0.34	1.06	3054	11382
3188.3	200	1.70	15	1.04	0.01	1.28	0.41	0.07	3109	11437
3212.5	1030	3.35	150	9.48	0.94	1.13	1.29	1.10	3132	11460
3268.1	500	2.31	115	6.53	0.29	1,79	0.24	0.26	3186	11515
3333.1	180	0.66	45	2.10	0.12	0.00	0.54	0.25	3250	11578
3359.1	250	1.70	30	1.29	0.00	0.80	0.90	–0.04	3275	11603
3385.2	70	0.40	15	0.60	0.01	0.09	0.30	0.06	3301	11629
3403.7	600	3.58	2.0	0.06	0.05	1.46	2.07	0.33	3319	11647
3410.4	1500	1.89	90	3.50	1.57	0.00	0.00	0.00	3325	11653
3434.7	180	0.29	775	28.0	0.16	0.09	0.04	0.09	3349	11677
3502.2	750	0.83	320	9.59	0.71	0.00	0.12	0.30	3415	11743
3549.1	2200	3.54	340	9.22	1.75	1.67	0.12	0.45	3460	11789
3572.0	770	3.75	975	24.7	0.04	0.78	2.93	0.34	3483	11811
3592.4	70	0.32	230	5.60	0.01	0.09	0.23	0.04	3503	11831
3618.0	325	0.33	60	1.37	0.28	0.01	0.04	–0.10	3528	11856
3634.9	450	0.48	420	9.21	0.38	0.10	0.00	0.01	3544	11872
3688.6	2200	3.10	2	0.05	1.57	1.46	0.07	0.32	3596	11925

(continued) $^{40}_{20}$Ca(p)

$E_\circ$ [keV]	Γ_p [eV]	γ_p^2 [keV]	Γ_α [eV]	γ_α^2 [keV]	γ_{20}^2 [keV]	γ_{12}^2 [keV]	γ_{22}^2 [keV]	$\gamma_{20}\gamma_{22}$ [keV]	E_{cm} [keV]	E^* [keV]
3736.2	240	0.88	13	0.32	0.03	0.52	0.33	–0.10	3643	11971
3910.8	1000	0.88	240	2.82	0.69	0.00	0.19	0.36	3813	12141
3963.6	1000	1.03	240	2.51	0.61	0.33	0.09	0.24	3864	12193
3998.2	425	1.34	9	9.12	0.00	0.48	0.86	0.01	3898	12227

Parameters γ_{sl} – partial reduced widths for entrance channel with spin s and orbital angular momentum ℓ were determined from measurements of angular distribution of α-particles from the well isolated 2^+ resonances.
Out of 50 2^+ resonances in [87Wa0A] 8 had no discernible yield in the (p,α) channel, 5 were assigned a different J^π value, 9 interfered too strongly with a nearby resonance to be analyzed and 2 resonances were reassigned 2^+.
The obtained products of amplitudes $\gamma_{20}\gamma_{22}$ were compared with GOE (Gaussian Orthogonal Ensemble) version of the theory. Deviation at the significance level >99% were obtained (see majority of the positive signs in the last column).

Branching ratios of γ-transitions [88Sc23, 90En08]. Part 1. $^{40}_{20}$Ca(p)

E^* [keV]	J^π	T	Γ_{cm} [keV]	$E_\circ$	Branching ratios Percentage									Ref.
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J_f^π					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
3352.62(9)	0^+														
3736.69(5)	3^-				100										
3904.38(3)	2^+				≈100	0.08(7)									
4491.43(4)	5^-				<0.5		100	<1							
5211.56(17)	0^+							100							
5248.79(5)	2^+				79.8(12)	4.9(6)	<0.6	15.3(9)							
5278.80(6)	4^+						<0.9	100	<1.1						
5613.52(3)	4^-						70(2)		30(2)						
5629.41(6)	2^+				88.0(9)	12.0(9)	<1.1	<0.8			<1.0	<1.1			
5902.63(7)	1^-				100		<6	<0.8			<0.5				
6025.47(5)	2^-				<2		82.7(9)	17.3(9)			<0.4		<0.4	<0.4	
6029.71(6)	3^+						<6	79(2)			21(2)	<1	<2	<2	
6285.15(4)	3^-				3.1(5)		3.5(4)	19.8(6)	72.6(11)		<0.3	<0.4	1.0(2)	<0.6	
6422.4(10)	2^+				100										
6507.87(13)	4^+						<3	84(3)	<2		13(3)	3(2)	<2	<2	
6542.80(9)	4^+						<3	59(2)	<2		14(2)	8(2)	<2	19(2)	
6582.47(10)	3^-				<2		66.4(13)	15.8(10)	<0.7		<0.8	<0.9	17.8(15)	<0.5	
6750.41(7)	2^-				<8		100	<10			<8		<2	<7	
6908.70(8)	2^+				100		<0.9	<0.7			<0.4	<0.9		<0.6	
6931.29(6)	3^-,4^+				<3		82.7(7)	2.0(3)	1.4(3)		6.1(3)	<0.3	2.0(3)	5.8(3)	

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	J^π	T	Γ_{cm}	Branching ratios								
[keV]			[keV]	Percentage								
E^*				0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629
J^π_{f}				0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+
6932(1)	$\langle 6^+\rangle$					<6					100		
6938.0(18)						>80							
6950.48(7)	1^-			100		<5	<4			<2			<2
7113.1(10)	1^-			65			18			14			3
7113.73(5)	4^-					65.1(7)		25.9(5)			1.7(3)	6.2(4)	
7239.07(8)	3^-–5^-					40		40				20	
7277.82(8)	2^+,3^+			<3		100				<6	<10	<4	<5
7300.67(11)	0^+					<2	<5			95.0(15)			5.0(15)
7399(1)	$\langle 5^+\rangle$										>80		
7421.9(15)						>80							
7446.23(6)	3^+,4^+					<0.9	<2	<1.4		42.7(11)	23.8(11)	20.7(8)	12.8(7)
7466.35(7)	2^+			55(2)	11.6(10)	<1.7	19.9(14)			13(2)	<0.6		<0.6
7532.26(5)	2^-			<2		42.5(16)	15.3(14)			<3		24.2(14)	<0.6
7561.17(7)	3^+					9(2)	<4			61(4)	<0.9	<0.9	<0.6
7623.11(8)	$\langle 2$–$4\rangle$			<0.5		20.6(7)	<1.0	<0.7		11.3(7)	<0.9	32.2(10)	35.9(10)
7658.23(5)	4^-	1				26(3)		22(3)			<2	39(3)	
7677(1)	$\langle 6^+\rangle$										100		
7694.08(4)	3^-	1		<3		90.8(12)	<2	<2		<1.5	<1.5	9.2(12)	<1.2
7701.8(4)	0^+						100						
7769.4(10)	$\langle 3$–$5\rangle$					66(6)						34(6)	
7814.7(6)	0^+						70			30			
7872.2(1)	2^+			84(6)	16(6)*								
7928.4(1)	4^+					<7	<5	50(9)		<6	<3	50(9)	<4
7975(1)	$\langle 6^+\rangle$												
7976.5(5)	2^+			10	30		50				10		
8018.8(10)	0^+									>80			
8051.8(6)													
8091.6(2)	2^+			100									
8102(1)	$\langle 8^+\rangle$												
8113.2(5)	1			100									
8134.8(1)	$\langle 2$–$4\rangle$						34(10)	<5				$\langle 8\rangle$	28(3)
8187.5(8)	$\langle 3$–$5\rangle$					100							
8195.9(6)													
8271(1)	$\langle 0$–$3\rangle^-$												
8276(1)	0^+												>80
8323.2(1)	1^-,2^+			2.0(7)		59(2)	<1.3	<0.5		2.7(5)	<0.3	<0.3	<0.4
8338.0(3)	2^+–5^-												
8358.9(6)	$\langle 0$–$2\rangle^-$												
8373.9(2)	4^+						70(20)	30(20)*					
8424.8(1)	2^-	1		<1.5		70(4)	<4			<4		<3	
8439.0(5)	0^+												>80
8484.0(1)	0^+					>90							

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	J^π	T	Γ_{cm}	$E_\circ$	Branching ratios										Ref.
[keV]			[keV]		Percentage										
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J^π_{f}					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
8540(4)					60	40									
8551.1(7)	5^-	1							100						
8578.8(1)	2^+				100		<6	<4			<5	<5		<4	
8587(6)							60	10				15			
8631(5)															
8665.3(8)	1^-				100										
8678.3(1)	4^+						65(15)								
8710(8)															
8748.2(1)	2^+				100										
8764.2(1)	3^-							22(6)				34(10)		19(7)	
8810(7)															
8850.6(9)	$\langle 6\text{–}8\rangle^-$														
8909.0(9)															
8934.8(1)	2^+														
8937(1)	$\langle 7^+\rangle$														
8938.4(9)	0^+														
8980(5)	$\langle 5\text{–}7\rangle^+$														
8980.6(12)	2^+				100										
8994.5(1)	$1^-,2^+$				100										
9031.9(3)	4^-								28(5)			12(5)	40(5)		
9050.1(10)															
9080.3(11)															
9091.7(1)	3^-			783.23			70	20				10			66Le08
9135.7(1)	$2^-,3^-$	0		828.27			70	15							66Le08
9162.1(11)															
9171(10)															
9185.3(12)															
9197(10)															
9209.8(1)	$2^-,3^-$	0													
9226.7(1)	$1^-\text{–}3^-$														
9227.4(1)	$\langle 1,2^+\rangle$														
9237(3)	$\langle 6\text{–}8\rangle^-$														
9246.0(12)															
9274.5(12)															
9304(5)	0^+														
9306(1)	$\langle 8^+\rangle$														
9362.5(1)	3^-	0		1061.0			6.3	8.2			4.8		13		88Sc23
9377.8(2)				1076.7			x	x							66Le08
9388.2(2)	2^+			1087.4	40		6.7	3.4		11	3.1	5.9		7.6	88Sc23
9395.7(3)	$3^-,4^+$			1095.0			65	15	20						66Le08
9404.9(2)	2^-	1	0.14	1104.4	2.6		18	2.7							88Sc23
9406.4(6)	0^+	1													

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^* [keV]	J^π	T	Γ_{cm} [keV]	$E_\circ$	Branching ratios Percentage										Ref.
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J^π_{f}					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
9412.4(2)															
9418.8(2)	3^-	1		1118.8			7.5				1.8		2.0		88Sc23
9429.1(1)	3^-,4^-	0		1129.3			15		24						88Sc23
9432.5(2)	1^-	1	0.23	1132.8	93			1.0							88Sc23
9453.9(1)	3^-	0	0.09	1154.8			3.7	3.3				1.6	9.4	3.0	88Sc23
9500.0(15)				1202.4			60					15			66Le08
9536.3(2)	$\langle 3,4\rangle^+$			1239.3			25	15							66Le08
9537.9(5)	1^-		0.4	1240.9	70			30							66Le08
9564(5)	2^+	$\langle 1\rangle$													
9603.0(4)	3^-	1		1307.7			13								88Sc23
9604.6(4)	1^-	1	0.19	1309.7	86	1.2		0.9							88Sc23
				1337.2			x	x				x			66Le08
9640.9(1)	2^-	1		1346.6	1.5		39	47						4.3	88Sc23
9655.6(9)	$\langle 1,2^+\rangle$			1361.7	100										66Le08
9662.3(2)	$\langle 0–3\rangle^-$														
9668.7(1)	3^-	1		1375.1			15								68Li12
9779.5(1)	3	1		1488.5			5.6	13			1.1	6.2	21	2.2	88Sc23
9785.3(2)	$1,2^+$			1494.7	85	9.6		2.5							88Sc23
9802.2(7)	$\langle 1–3\rangle^-$			1512.1			70	30							66Le08
				1516.2	100										66Le08
9811.1(2)	$\langle 3–5^-\rangle$			1521.2			x								66Le08
9829.5(2)	1^-–4^+			1540.1			35	45						20	66Le08
9835.1(2)	2^+–5^-			1545.8			70					30			66Le08
9854.5(2)	$\langle 1–3\rangle^-$			1563.8			x	x							66Le08
9855(1)	$\langle 8^+\rangle$														
9859.7(3)	$\langle 4–6\rangle^-$														
9865.2(1)	1	1	0.10	1576.7	76	13		4.5		0.4				0.3	88Sc23
9869.3(4)	$\langle 1,2^+\rangle$		0.9	1580.9	76	13		5.6		0.6	0.8				88Sc23
9898.6(3)															
9921.4(2)	3–5^-			1634.3			x								66Le08
9939.8(2)															
9954.0(1)	4^+			1667.8			10	9	4			77			66Le08
9977.2(2)	$\langle 3–5\rangle$														
9993.7(15)															
10040.5(1)	2^-,3^-	1		1756.6				30						20	66Le08
10045.7(5)	3^-–7^-														
10049.4(1)	4^-			1765.6			55	20							66Le08
10058.0(3)															
10065(2)	1^-,2^+	0													
10080.7(2)															
10130.7(2)	3^-,4^+	0		1854.1			40	20	20			20			66Le08
10154(7)	$\langle 3–5\rangle$	0													

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	J^π	T	Γ_{cm}	$E_\circ$	Branching ratios										Ref.
[keV]			[keV]		Percentage										
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J^π_{f}					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
10193(7)	$\langle 3\text{–}5\rangle$	0													
10199.2(4)	1^-	0	0.27												
10205.1(8)															
10210.6(2)	$\langle 3,4\rangle^-$														
10232.8(7)				1953.8			100								66Le08
10262.5(1)	3^-	0+1	0.4	1984.3			15	40							66Le08
10267.7(5)	N	0													
10274.8(3)	$\langle 3\text{–}5\rangle^+$														
10277.9(2)	1^-	0	1.1												
10285.0(3)															
10318.8(4)	1^+	1	0.09	2042.0	90	7		2							66Le08
10332.6(15)	3^-	0													
10358.6(15)															
10361.5(15)	3^-	0	3.9												
10375.5(15)															
10383.9(2)	$1^-,2^+$	0													
10415.1(1)	3	1					7	2	6		4	5	8		68Li12
10420.7(10)	$\langle 0\text{–}2\rangle$	0													
10430.6(2)	N	0													
10441.4(6)															
10443.9(2)	3^-	0	0.44												
10470.0(15)	$3^-,5^-$	0													
10478.7(15)															
10503.1(15)	$\langle 3\text{–}5\rangle^-$														
10514.8(15)	$\langle 3\text{–}5\rangle$	0													
10527.8(15)	$\langle 1\text{–}4\rangle$			2258.0			90	10							66Le08
10540.0(15)	2^+	0													
10552.2(15)															
10583(5)	$\langle 3\text{–}5\rangle$														
10597(2)	3^-	0													
10623(3)	1^-	0	5.0												
10632.7(2)															
10639.1(1)	$\langle 3\text{–}5\rangle$	1		2370.6			40	20					20		66Le08
10646.4(4)	N	0													
10653.2(2)	$\langle 1\text{–}4\rangle$			2385.1			25	75							66Le08
10658(3)	2^+	0	0.35												
10670.4(3)	1^-		5.7	2402.8			20	80							66Le08
10673.7(2)	$\langle 1\text{–}4\rangle$			2406.1	100										66Le08
10676(3)	1^-	0	0.33												
10691.0(3)	2^+		0.14	2425.5	x	x		x							66Le08
10699.5(1)	3			2433.7			25	60	15						66Le08
10720.8(3)	$3^-,5^-$	0													

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	J^π	T	Γ_{cm}	$E_\circ$	Branching ratios										Ref.
[keV]			[keV]		Percentage										
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J^π_{f}					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
10737.7(3)	1^-	0+1	0.5	2473.9	x		x								66Le08
10747.8(4)	4^+	0		2482.9				100							66Le08
10753.9(2)	$\langle 3\text{–}5\rangle$														
10770.2(3)	$\langle 1,2^+\rangle$														
10776.3(3)	3^-	0	12	2513.0	30		15	25					15		66Le08
10780.9(3)	2^+	0	0.18												
10787.7(3)															
10800.0(10)	$1^-,2^+$	0													
10813.7(5)	$\langle 3\text{–}5\rangle$	0													
10830.6	N	0													
10848.5(4)	$3^-,5^-$	0													
10862(3)	2^+	0	0.045												
10868.8(4)															
10910.0(4)	$\langle 3\text{–}5\rangle$	0	2.3	2652.9			x								66Le08
10921.1(4)	$\langle 2\text{–}4\rangle$			2659.9				x				x			66Le08
10934(3)	1^-	0	5.0												
10947(3)	2^+	0	0.23												
10951.5(4)	1^-	0	10												
10956.0(4)	$\langle 3\text{–}5\rangle$	0													
10976.3(15)	$\langle 3\text{–}5\rangle$														
10988.0(4)	$\langle 3\text{–}5\rangle$	0													
10994.7(4)	$\langle 1^-\rangle$		6.7												
11002.4(5)	$1^-,3^-$	0													
11004(1)	$\langle 10^+\rangle$														
11011.0(4)	3^-	0+1	0.3												
11023.8(5)	1^-	0	0.27												
11038(7)	$\langle 3\text{–}5\rangle$														
11042.0(5)	2^+	0	0.50												
11070.6(4)	$\langle 1\text{–}4\rangle$			2815.7			20	60			20				66Le08
11078(3)	N	0													
11087(3)	$3^-,4^+$	0													
11108(3)	0^-		5.2												
11117.1(5)															
11127.2(5)	$\langle 4^+\rangle$	0													
11143(6)	$\langle 3\text{–}5\rangle^-$														
11158(3)	N	0													
11165.3(4)	$\langle 4^+\rangle$	0													
11205(5)	$3^-,5^-$	0													
11217(3)	3^-		25												
11227(3)	$\langle 1\text{–}3\rangle^-$														
11236(3)	1^-		12												
11249(3)	$\langle 3^-\rangle$	0													

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^* [keV]	J^π	T	Γ_{cm} [keV]	$E_\circ$	Branching ratios Percentage										Ref.
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J^π_{f}					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
11266(3)	2^+	0													
11311(4)	$\langle 3\text{–}5\rangle$	0													
11324(3)	$1^-,2^+$	0													
11333(3)	N	0													
11350(3)	N	0													
11369(3)	2^+	0													
11384(3)	2^+	0													
11405(4)	N	0													
11417(3)	4^+	0													
11429(4)	N	0													
11435(4)	2^+	0													
11440(3)	2^+	0													
11448(3)	N	0													
11456(4)	N	0													
11459(2)	2^+	0													
11468(3)	$\langle 3\text{–}5\rangle$	0													
11549(5)	$3^-,5^-$	0													
11617(10)	$\langle 3\text{–}5\rangle$														
11663(6)	$\langle 3\text{–}5\rangle$	0													
11687(1)	$\langle 10^+\rangle$														
11710(1)	$\langle 9^+\rangle$														
11726(5)	$3^-,5^-$	0													
11792(10)	$\langle 3\text{–}5\rangle$														
11841(6)	$\langle 3\text{–}5\rangle$	0													
11988(2)	0^+	2	0.08												
12000(5)	$3^-,5^-$	0													
12035(10)	$\langle 3\text{–}5\rangle^-$														
12066(6)	$3^-,5^-$	0													
12337(1)	$\langle 10^+\rangle$														
12593(1)	$\langle 10^+\rangle$														
13116(1)	$\langle 12^+\rangle$														
13537(2)	$\langle 11^+\rangle$														
13921(15)	$\langle 4^-\rangle$	$\langle 0\rangle$													
14233(2)	$\langle 12^+\rangle$														
14283(15)	6^-	1													
15154(2)	$\langle 13^+\rangle$														
15270(2)	$\langle 12^+\rangle$														
15749(2)	$\langle 12^+\rangle$														
16530(2)	$\langle 14^+\rangle$														
16581(2)	$\langle 13^+\rangle$														
17699(2)	$\langle 14^+\rangle$														
18055(2)	$\langle 14^+\rangle$														

(continued) $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	J^π	T	Γ_{cm}	$E_\circ$	Branching ratios										Ref.
[keV]			[keV]		Percentage										
E^*					0.0	3353	3737	3904	4491	5212	5249	5279	5613	5629	
J^π_{f}					0^+	0^+	3^-	2^+	5^-	0^+	2^+	4^+	4^-	2^+	
18500(2)	$\langle 14^+\rangle$														
18724(2)	$\langle 14^+\rangle$														
19197(2)	$\langle 15^+\rangle$														
20580(2)	$\langle 16^+\rangle$														
22063(2)	$\langle 16^+\rangle$														

* transition to the unknown level

The first excited state mainly decays by pair emission [90En08].

From the resonance at $E_\circ$=1487 keV (E^*=9779 keV, J^π=3, T=1) five additional transitions to the following levels (and their branching ratios) were found: E^*=7870 (6.0), 7930 (3.6), 8140 (3.6), 8580 (4.5) and 8750 keV (3.3 %).

Resonances at $E_\circ$=1337 and 1516 keV (E^*=9632 and 9807 keV) are not included in [02Nu0A].

Branching ratios of γ-transitions [88Sc23, 90En08]. Part 2. $^{40}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	$E_\circ$	Branching ratios											
[keV]		Percentage											
E^*		5903	6025	6030	6290	6508	6543	6582	6750	6909	6930	6950	7113
J^π_{f}		1^-	2^-	3^+		4^+	4^+	3^-	2^-	2^+			1^-
7113.73			1.1(3)										
7532.26		3.4(10)	4.8(4)		9.8(9)								
7561.17				30(3)									
7623.11													
7658.23					13(2)								
8102											100		
8134.77		30(10)*											
8271			40									60	
8323.16		1.1(7)	15.6(10)		1.3(3)				7.4(6)	11(2)*			
8338.0						25(6)	60(6)	15(8)*					
8358.9												>90	
8424.81		17(3)	13(3)										
8587			15										
8678.29					13(5)	22(16)*							
8764.18				16(6)	9*								
9031.9					10(3)								
9135.66	828.27				15								
9362.54	1061.0				3.4			2.9	1.5			1.3	
9377.8	1076.7				x								

(continued) $^{40}_{20}$Ca(p)

E^*	$E_\circ$	Branching ratios											
[keV]		Percentage											
E^*		5903	6025	6030	6290	6508	6543	6582	6750	6909	6930	6950	7113
J^π_f		1^-	2^-	3^+		4^+	4^+	3^-	2^-	2^+			1^-
9388.20	1087.4		2.5		1.3	3.6	11						
9395.7	1095.0												
9404.85	1104.4	7.3			37			3.8		2.9		1.5	7.4
9418.8	1118.8	4.9	2.3		42				2.6				26
9429.11	1129.3							8					
9432.46	1132.8		2.1						0.9			0.7	
9453.95	1154.8		2.0	28					2.0				12
9536.35	1239.3				50								
9603.0	1307.7				54								33
9604.6	1309.7		4.1						1.7			1.1	
9668.71	1375.1				49								36
9779.47	1488.5			1.1		0.5	0.7	1.0		4.6			
9785.3	1494.7									0.7			
9865.15	1576.7	0.4								1.0		0.2	
9869.3	1580.9									0.9			
10049.38	1765.6												20
10262.53	1984.3			25									
10415.06				7						16			

* transition to the unknown level

The first excited state mainly decays by pair emission [90En08].

From the resonance at $E_\circ$=1487 keV (E^*=9779 keV, J^π=3, T=1) five additional transitions to the following levels (and their branching ratios) were found: E^*=7870 (6.0), 7930 (3.6), 8140 (3.6), 8580 (4.5) and 8750 keV (3.3 %).

Resonances at $E_\circ$=1337 and 1516 keV (E^*=9632 and 9807 keV) are not included in [02Nu0A].

Branching ratios of γ-transitions [88Sc23, 90En08]. Part 3. $^{40}_{20}$Ca(p)

E^*	$E_\circ$	Branching ratios											Com.
[keV]		Percentage											
		7280	7301	7446	7466	7532	7561	7623	7658	7677	7690	9866	10320	E^*, keV
			0^+	X^+	2^+	2^-	3^+		4^-					J^π_f
9031.9											10(3)			
9362.54	1061.0							1.6	11		46			
9388.20	1087.4		1.0								2.9			
9404.85	1104.4	0.8				16								
9418.8	1118.8					2.0		1.7	2.8		4.4			
9429.11	1129.3								40		13			

(continued) **$^{40}_{20}$Ca(p)**

E^*	$E_\circ$	Branching ratios											Com.
[keV]		Percentage											
		7280	7301 0^+	7446 X^+	7466 2^+	7532 2^-	7561 3^+	7623	7658 4^-	7677	7690	9866	10320	E^*, keV J^π_f
9432.46	1132.8					2.3								
9453.95	1154.8								10		25			
9500.0	1202.4										25			
9536.35	1239.3										10			
9604.6	1309.7					5.0								
9640.89	1346.6				8.2									
9779.47	1488.5				3.0		19							
9785.3	1494.7		2.2											
9865.15	1576.7	0.2	2.8								0.6			
9869.3	1580.9		2.3								0.8			
10049.38	1765.6										5			
10262.53	1984.3				20									
10318.8	2042.0				⟨1⟩									
10415.06				19	9			⟨17⟩						
11988												57(5)	43(5)	

The first excited state mainly decays by pair emission [90En08].
From the resonance at $E_\circ$=1487 keV (E^*=9779 keV, J^π=3, T=1) five additional transitions to the following levels (and their branching ratios) were found: E^*=7870 (6.0), 7930 (3.6), 8140 (3.6), 8580 (4.5) and 8750 keV (3.3 %).
Resonances at $E_\circ$=1337 and 1516 keV (E^*=9632 and 9807 keV) are not included in [02Nu0A].

Target isotope: $^{36}_{18}$Ar $I^\pi_\circ = 0^+$ *Abundance:* 0.3365(30) % Q_α = 7040.58(39) keV **$^{40}_{20}$Ca(α)**

$E_\circ$	J^π T	Γ_{cm}	$S_{\alpha\gamma_\circ}$	Γ_α/Γ_p	$S_{p\gamma_\circ}$	$\Gamma_{\alpha_\circ}/\Gamma$	E_{cm}	E^*	Ref.
[keV]		[keV]	[eV]		[eV]		[keV]	[keV]	
5496(4)	0^+ 2					0.93(9)		11988(2)	82Pr05
5619		weak					5057	12098	67Na10
6590(20)			3.4(17)	0.29	11.9(60)		5931	12972	73Wa08
6900(20)		9.3	9.7(49)	0.50	19.3(96)		6210	13251	73Wa08
7160(20)			3.4(17)	0.52	6.6(33)		6444	13485	73Wa08
7420(20)			3.7(18)	0.56	6.6(33)		6678	13719	73Wa08
7680(20)		24	14.6(73)	0.33	44.6(223)		6912	13953	73Wa08
7840(20)			14.4(72)	0.51	28.4(142)		7056	14097	73Wa08
8200(20)			4.7(23)				7380	14421	73Wa08
8300(20)			4.5(22)				7470	14511	73Wa08
8700(20)			6.3(31)				7830	14871	73Wa08
11810(20)			5.8(29)				10629	17670	73Wa08
12020(20)			5.4(27)				10818	17859	73Wa08

(continued) $^{40}_{20}\mathbf{Ca}(\alpha)$

$E_\circ$ [keV]	J^π	T	$\Gamma_{\rm cm}$ [keV]	$S_{\alpha\gamma_\circ}$ [eV]	$\Gamma_\alpha/\Gamma_{\rm p}$	$S_{{\rm p}\gamma_\circ}$ [eV]	$\Gamma_{\alpha_\circ}/\Gamma$	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.
12340(20)				11.3(57)				11106	18147	73Wa08
12540(20)				9.4(47)				11286	18327	73Wa08
12680(20)				6.9(35)				11412	18453	73Wa08
12990(20)				10.3(51)				11691	18732	73Wa08
13330(20)				4.9(24)				11997	19038	73Wa08

Additional data on this isotope can be found in [82Pr05, 75Sh16, 74Fo04, 73Br34, 69WaZY].
Parameter $S_{{\rm p}\gamma_\circ}$ from [70He08] was used in [73Wa08] for the estimation of ratio $\Gamma_\alpha/\Gamma_{\rm p}$.

Target isotope: $^{41}_{19}$K $I^\pi_\circ = 3/2^+$ *Abundance:* 6.7302(44) % $S_{\rm p} = 10276.86(28)$ keV $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	$\Gamma_{\rm p}$ [eV]	$S_{\rm pp}$ [eV]	$S_{{\rm p}\alpha_\circ}$ [eV]	$\omega\gamma_{{\rm pp}'}$ [eV]	Γ_α [eV]	$S_{{\rm p}\gamma}$ [eV]	Γ [eV]	$S_{\rm pn}$ [eV]	$\Gamma_{\rm n}$ [eV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.		
1052(1)								1.2(6)				1027	11304(2)	63Si13	67En05	
1058(1)								1.2(6)				1033	11310(2)	63Si13	67En05	
1068(1)								1.2(6)				1043	11319(2)	63Si13	67En05	
1075(1)								3.5(17)				1049	11326(2)	63Si13	67En05	
1080(1)								0.6(3)				1054	11331(2)	63Si13	67En05	
1085(1)								1.2(6)				1059	11336(2)	63Si13	67En05	
1093(1)								3.5(17)				1067	11344(2)	63Si13	67En05	
1111(1)								10(5)				1085	11361(2)	63Si13	67En05	
1113(1)								8(4)				1086	11363(2)	63Si13	67En05	
1131(1)								5(3)				1104	11381(2)	63Si13	67En05	
1149(1)								1.8(9)				1122	11399(2)	63Si13	67En05	
1152(1)								2.4(12)				1125	11401(2)	63Si13	67En05	
1160(1)								8(4)				1132	11409(2)	63Si13	67En05	
1163(1)								9(5)				1135	11412(2)	63Si13	67En05	
1168(1)								6(3)				1140	11417(2)	63Si13	67En05	
1178.2(15)					3.1(9)			7(4)				1150	11427(2)	70De10	63Si13	67En05
1181.0(15)					2.6(8)							1153	11430(2)	70De10		
1183.5(15)					5.6(17)			0.6(3)				1155	11432(2)	70De10	63Si13	67En05
1187.1(15)					2.8(8)			1.2(6)				1159	11436(2)	70De10	63Si13	67En05
1192.1(15)					1.9(6)			10(5)				1164	11441(2)	70De10	63Si13	67En05
1196.1(15)					1.9(6)							1168	11445(2)	70De10		
1199.6(15)					6.8(20)			5(3)				1171	11448(2)	70De10	63Si13	67En05
1200.9(15)					10(3)							1172	11449(2)	70De10		
1202.4(15)					9.0(27)							1174	11451(2)	70De10		
1205.1(15)					1.9(6)							1176	11453(2)	70De10		
1217.0(15)					0.7(2)							1188	11465(2)	70De10		
1220.5(15)					0.7(2)							1191	11468(2)	70De10		
1221.7(15)					2.6(7)							1193	11470(2)	70De10		
1226.0(15)					6.0(18)							1197	11474(2)	70De10		

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_pp [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	$\omega\gamma_{\mathrm{pp}'}$ [eV]	$\omega\gamma_{\mathrm{p}\alpha}$ [eV]	Γ_α [eV]	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.	
1228.3(15)					5.6(17)							1199	11476(2)	70De10	
1230.3(15)					3.5(11)							1201	11478(2)	70De10	
1237.85(50)					7.4(22)							1208	11485(2)	70De10	70Kn03
1239.49(50)					15(5)							1210	11489(2)	70De10	70Kn03
1243.2(15)					9.2(28)							1214	11491(2)	70De10	
1246.6(15)					2.1(6)							1217	11494(2)	70De10	
1252.85(100)					1.6(5)							1223	11500(2)	70De10	70Kn03
1254.3(15)					2.4(7)							1224	11501(2)	70De10	
1256.6(15)					2.8(8)							1227	11504(2)	70De10	
1258.7(15)					2.7(8)							1229	11506(2)	70De10	
1262.2(15)					2.4(7)							1232	11509(2)	70De10	
1264.3(15)					7.1(21)							1234	11511(2)	70De10	
1265.75(50)					5.7(17)							1236	11513(2)	70De10	70Kn03
1270.1(15)					1.9(6)							1240	11517(2)	70De10	
1271.8(15)					2.9(9)							1242	11518(2)	70De10	
1277.0(15)					1.1(3)							1247	11524(2)	70De10	
1279.2(15)					1.8(5)							1249	11526(2)	70De10	
1281.2(15)					3.9(12)							1251	11528(2)	70De10	
1283.2(15)					10(3)							1253	11530(2)	70De10	
1284.9(15)					6.9(20)							1254	11531(2)	70De10	
1286.5(15)					2.5(8)							1256	11533(2)	70De10	
1294.1(15)					10(3)							1263	11540(2)	70De10	
1296.5(15)					14(4)							1266	11543(2)	70De10	
1297.8(15)					10(3)							1267	11544(2)	70De10	
1298.6(15)					18(5)							1268	11545(2)	70De10	
1304.4(15)					2.2(7)							1273	11550(2)	70De10	
1305.9(15)					2.7(10)							1275	11552(2)	70De10	
1309.9(15)					6.9(20)							1279	11556(2)	70De10	
1310.8(15)					12(4)							1280	11557(2)	70De10	
1312.7(15)					15(5)							1281	11558(2)	70De10	
1317.5(15)					1.0(3)							1286	11563(2)	70De10	
1324.0(15)					4.2(13)							1292	11569(2)	70De10	
1326.6(15)					3.3(10)							1295	11572(2)	70De10	
1327.7(15)					2.8(8)							1296	11573(2)	70De10	
1330.2(15)					3.2(9)							1299	11575(2)	70De10	
1331.2(15)					2.4(7)							1300	11576(2)	70De10	
1345.1(15)					9.0(27)							1313	11590(2)	70De10	
1346.5(15)					13(4)							1314	11591(2)	70De10	
1348.0(15)					13(4)							1316	11593(2)	70De10	
1350.0(15)					5.4(16)							1318	11595(2)	70De10	
1352.2(15)					13(4)							1320	11597(2)	70De10	
1355.0(15)					20(6)							1323	11600(2)	70De10	
1357.4(15)					16(5)							1325	11602(2)	70De10	
1359.2(15)					9.3(28)							1327	11604(2)	70De10	
1368.4(15)	1^-	$\langle 2\rangle$	160(50)	465(240)	18(5)			5(2)	<190	<5	<3	1336	11613(2)	70De10	70De11

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_pp [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	$\omega\gamma_{\mathrm{pp}'}$ [eV]	Γ_α [eV]	$S_{\mathrm{p}\gamma}$	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.	
1369.9(15)					15(5)							1337	11614(2)	70De10	
1372.0(15)					17(5)							1339	11616(2)	70De10	
1377.1(15)					6.0(18)							1344	11621(2)	70De10	
1389.2(15)					2.1(6)							1356	11633(2)	70De10	
1390.9(15)					12(4)							1358	11635(2)	70De10	
1392.6(15)					3.5(10)							1359	11636(2)	70De10	
1393.9(15)					20(6)							1361	11638(2)	70De10	
1395.9(15)	1^-	$\langle 2\rangle$	25(10)	48(30)	27(9)		14(5)		<160	<5	<4	1363	11640(2)	70De10	70De11
1397.7(15)					21(6)							1364	11641(2)	70De10	
1400.1(15)					4.5(14)							1367	11644(2)	70De10	
1400.9(15)					8.0(24)							1368	11644(2)	70De10	
1402.9(15)	1^-,2^+				10(3)		α_o	γ_o			n_o	1370	11646(2)	70De10	67Lu08
1408.0(15)					4.1(12)							1374	11651(2)	70De10	67Lu08
1410.3(15)					2.4(7)							1377	11654(2)	70De10	
1411.1(15)					4.2(13)						n_o	1378	11654(2)	70De10	67Lu08
1413.8(15)					20(6)		α_o	γ_o				1380	11657	70De10	67Lu08
1415(2)											n_o	1381	11658		67Lu08
1419.3(15)	0^+				15(5)		α_o				n_o	1386	11662	70De10	67Lu08
1422.1(15)					12(4)						n_o	1388	11665	70De10	67Lu08
1428.2(15)					1.3(4)						n_o	1394	11671	70De10	67Lu08
1438(2)								γ_o				1404	11681		67Lu08
1443(2)												1409	11686		67Lu08
1447.0(15)					20(6)		α_o				n_o	1413	11689	70De10	67Lu08
1452.9(15)	3^-				34(10)		α_o				n_o	1418	11695	70De10	67Lu08
1455.3(15)					31(10)		α_o					1421	11698	70De10	67Lu08
1457.7(15)					9(3)		α_o					1423	11700	70De10	67Lu08
1465.7(15)					4.7(14)			γ_o				1431	11708	70De10	67Lu08
1467.4(15)	2^+				28(8)		α_o				n_o	1433	11709	70De10	67Lu08
1468.4(15)					40(12)							1433	11710	70De10	67Lu08
1472(2)											n_o	1437	11714		67Lu08
1476.8(15)					2.6(8)		α_o	γ_o			n_o	1442	11719	70De10	67Lu08
1485.8(15)					2.2(7)		α_o	γ_o			n_o	1450	11727	70De10	67Lu08
1486.9(15)					11(3)							1452	11728	70De10	
1488.0(15)					9.7(29)							1453	11729	70De10	
1491.8(15)					13(4)		α_o	γ_o			n_o	1456	11733	70De10	67Lu08
1496.3(15)					12(4)							1461	11737	70De10	
1497.4(15)					30(9)		α_o	γ_o			n_o	1462	11739	70De10	67Lu08
1502.5(15)					3.4(10)		α_o	γ_o			n_o	1467	11744	70De10	67Lu08
1507.2(15)					4.5(14)							1471	11748	70De10	
1511.6(15)					4.5(14)			γ_o			n_o	1476	11753	70De10	67Lu08
1514(2)								γ_o			n_o	1478	11755		67Lu08
1516.0(15)					9(3)		α_o	γ_o				1480	11757	70De10	67Lu08
1519(2)											n_o	1483	11760		67Lu08
1523(2)											n_o	1487	11764		67Lu08
1528(2)											n_o	1492	11768		67Lu08

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_pp [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ_α [eV]	$S_{\mathrm{p}\gamma}$ [eV]	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.	
1532.5(15)					27(8)	α_o	γ_o				1496	11773	70De10	67Lu08
1537.1(15)					16(5)	α_o				n_o	1501	11777	70De10	67Lu08
1538.4(15)					12(4)	α_o	γ_o			n_o	1502	11779	70De10	67Lu08
1543.0(15)					18(5)	α_o	γ_o			n_o	1506	11783	70De10	67Lu08
1544.8(15)					18(5)						1508	11785	70De10	
1546.2(15)					6.7(20)						1509	11786	70De10	
1547.6(15)					9(3)	α_o	γ_o			n_o	1511	11788	70De10	67Lu08
1550.0(15)					7.6(23)						1513	11790	70De10	67Lu08
1555.5(15)					7.0(21)					n_o	1519	11795	70De10	67Lu08
1558.7(15)	1^-,2^+	$\langle 2\rangle$	200(70)	400(200)	210(63)	100(70)	γ_o	920(150)	<5	<4	1522	11798	83Sa15	67Lu08
1566.0(15)	1^-,2^+	$\langle 2\rangle$	140(60)	350(175)	12(4)	5(3)		110(250)	65(33)	26(15)	1529	11806	70De11	67Lu08
1568.9(15)					11(3)						1532	11808	70De10	
1571.8(15)	1^-,2^+	$\langle 2\rangle$	95(50)	250(125)	5.7(17)	<4	γ_o	130(150)	30(15)	11(7)	1534	11811	70De11	67Lu08
1578.9(15)					7(2)	α_o				n_o	1541	11818	70De10	67Lu08
1583.4(15)					3.5(11)		γ_o			n_o	1546	11823	70De10	67Lu08
1585.0(15)					5.5(17)						1547	11824	70De10	
1590.2(15)					12(4)		γ_o			n_o	1552	11829	70De10	67Lu08
1591.4(15)					34(10)						1554	11830	70De10	
1593.0(15)					34(10)		γ_o			n_o	1555	11832	70De10	67Lu08
1597.7(15)					9(3)	α_o				n_o	1560	11837	70De10	67Lu08
1601(2)										n_o	1563	11840		67Lu08
1604.8(15)					4.6(14)						1567	11844	70De10	
1606.4(15)					8(2)	α_o					1568	11845	70De10	67Lu08
1608.4(15)					10(3)						1570	11847	70De10	
1614.3(15)					11(3)	α_o					1576	11853	70De10	67Lu08
1618.2(15)					8.8(27)					n_o	1580	11857	70De10	67Lu08
1620(2)							γ_o			n_o	1581	11858		67Lu08
1627.7(15)					10(3)	α_o				n_o	1589	11866	70De10	67Lu08
1630(2)							γ_o			n_o	1591	11868		67Lu08
1633.7(15)	1^-				27(8)	α_o	γ_o			n_o	1595	11872	70De10	67Lu08
1635.0(15)					10(3)						1596	11873	70De10	
1635.9(15)					12(4)						1597	11874	70De10	
1640(2)										n_o	1601	11878		67Lu08
1643(2)							γ_o			n_o	1604	11881		67Lu08
1647.7(15)					43(13)					n_o	1609	11885	70De10	67Lu08
1650(2)										n_o	1611	11888		67Lu08
1658.1(15)					5.7(17)		γ_o			n_o	1619	11896	70De10	67Lu08
1664.9(15)					18(5)	α_o				n_o	1625	11902	70De10	67Lu08
1669.3(15)					29(9)	α_o				n_o	1630	11906	70De10	67Lu08
1673.8(15)					81(24)	α_o				n_o	1634	11911	70De10	67Lu08
1679(2)						α_o				n_o	1639	11916		67Lu08
1686.8(15)					130(39)	α_o				n_o	1647	11924	70De10	67Lu08
1689.1(15)					88(27)	α_o	γ_o			n_o	1649	11926	70De10	67Lu08
1693(2)										n_o	1653	11930		67Lu08
1696.8(15)					19(6)	α_o				n_o	1656	11933	70De10	67Lu08

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_pp [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ_α [eV]	$S_{\mathrm{p}\gamma}$ [eV]	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.	
1701(2)										n_o	1660	11937		67Lu08
1705.8(15)					9.0(27)						1665	11942	70De10	
1708.4(15)					62(19)	α_o	γ_o				1668	11945	70De10	67Lu08
1712(2)										n_o	1671	11948		67Lu08
1714.2(15)					83(25)	α_o	γ_o				1673	11950	70De10	67Lu08
1717(2)						α_o	γ_o			n_o	1676	11953		67Lu08
1723.5(15)					81(25)	α_o	γ_o				1683	11959	70De10	67Lu08
1727.2(15)					35(11)	α_o				n_o	1686	11963	70De10	67Lu08
1734.8(15)	1^-	$\langle 2\rangle$	120(30)	100(50)	260(78)	310(350)	γ_o	960(250)	<5	n_o	1694	11970	70De11	67Lu08
1741.6(15)					22(7)						1700	11977	70De10	
1745.1(15)	1^-	$\langle 2\rangle$	200(50)	380(140)	180(54)	95(50)	γ_o	640(250)	40(20)	21	1704	11980	70De11	67Lu08
1754.1(15)					8.9(27)						1712	11989	70De10	
1757.2(15)					120(36)						1715	11992	66Si0A	70De10
1762(2)											1720	11997	66Si0A	
1765.5(15)					59(18)						1724	12000	66Si0A	70De10
1770.5(15)					38(12)						1728	12005	66Si0A	70De10
1771.8(15)					53(16)						1730	12007	66Si0A	70De10
1777.6(15)					11(3)						1735	12012	66Si0A	70De10
1779.3(15)					110(33)						1737	12014	66Si0A	70De10
1786.2(15)					130(39)						1744	12021	66Si0A	70De10
1795.5(15)					34(10)						1753	12030	66Si0A	70De10
1798.6(15)					29(9)						1756	12033	66Si0A	70De10
1806.1(15)					9.4(28)						1763	12040	66Si0A	70De10
1808.2(15)					8.2(25)						1765	12042	70De10	
1809.2(15)					16(5)						1766	12043	66Si0A	70De10
1817.5(15)					23(7)						1774	12051	66Si0A	70De10
1818.6(15)					43(13)						1775	12052	66Si0A	70De10
1828.6(15)					17(5)						1785	12062	66Si0A	70De10
1833.1(15)					7.7(23)						1790	12066	66Si0A	70De10
1837.1(15)					39(12)						1793	12070	66Si0A	70De10
1838.5(15)					25(8)						1795	12072	66Si0A	70De10
1845(2)											1801	12078	66Si0A	
1850.2(15)					34(10)						1806	12083	66Si0A	70De10
1852.6(15)					18(5)						1809	12085	66Si0A	70De10
1859.5(15)					41(12)						1815	12092	66Si0A	70De10
1867(2)						α_o		$\gamma_{8.5}$		n	1823	12099	66Si0A	67An10
1869.1(15)	1^-	$\langle 2\rangle$	660(290)	1700(850)	70(20)	27(20)	γ_o	960(250)	200(100)	78	1825	12102	83Sa15	67An10
1873.0(15)					19(6)			$\gamma_{8.5}$			1828	12105	70De10	67An10
1877(2)								$\gamma_{8.5}$		n	1832	12109	66Si0A	67An10
1880.3(15)	1^-	$\langle 2\rangle$	740(80)	2030(400)	39(12)	14(5)		570(250)	150(75)	55	1836	12112	83Sa15	67An10
1881(2)							γ_o	$\gamma_{8.5}$			1836	12113	67An10	
1884.7(15)					240(72)	α_o				n	1840	12117	70De10	67An10
1892.1(15)					24(7)		γ_o	$\gamma_{8.5}$		n	1847	12124	70De10	67An10
1896.0(15)					200(60)	α_o	γ_o	$\gamma_{8.5}$			1851	12128	70De10	67An10
1898(2)								$\gamma_{8.5}$			1853	12130	67An10	

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_pp [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	Γ_α [eV]	$S_{\mathrm{p}\gamma}$ [eV]	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.	
1900(2)							γ_o	$\gamma_{8.5}$			1855	12132	67An10	
1903.8(15)					130(39)	α_o				n	1859	12135	70De10	67An10
1906.6(15)					110(33)	α_o					1861	12138	70De10	67An10
1911(2)							γ_o	$\gamma_{8.5}$		n	1866	12142	67An10	
1913(2)							γ_o	$\gamma_{8.5}$		n	1867	12144	67An10	
1913.6(15)					36(11)						1868	12145	70De10	
1915.7(15)					87(26)	α_o					1870	12147	70De10	67An10
1917.5(15)					66(20)	α_o		$\gamma_{8.5}$			1872	12149	70De10	67An10
1922.8(15)					53(16)	α_o		$\gamma_{8.5}$		n	1877	12154	70De10	67An10
1927.8(15)	1^-	$\langle 2\rangle$	130(50)	250(125)	150(45)	80(50)	γ_o	520(250)	<5	<5	1882	12159	70De11	67An10
1928(2)										n	1882	12159	67An10	
1932.4(15)	1^-	$\langle 2\rangle$	250(90)	500(250)	240(72)	120(80)	γ_o	600(250)	15(8)	7	1886	12163	70De11	67An10
1934(2)								$\gamma_{8.5}$		n	1888	12165	67An10	
1937(3)	$\langle 1^-\rangle$	$\langle 2\rangle$	100(50)	300(150)	<5	<5		$\gamma_{8.5}$	15(8)	n	1891	12168	83Sa15	67An10
1945.3(15)	1^-	$\langle 2\rangle$	740(100)	1940(450)	220(66)	84(30)	γ_o	720(250)	55(28)	21	1899	12176	70De11	67An10
1952.6(15)	1^-	$\langle 2\rangle$	440(50)	1210(250)	110(33)	40(20)	γ_o	290(250)	<5	n	1906	12183	70De11	67An10
1957.6(15)					32(10)		γ_o	$\gamma_{8.5}$		n	1911	12188	70De10	67An10
1959(2)							γ_o	$\gamma_{8.5}$		n	1917	12194	66Si0A	67An10
1968(2)								$\gamma_{8.5}$		n	1921	12198	67An10	
1973.3(15)					13(4)						1926	12203	66Si0A	70De10
1974.4(15)					19(6)	α_o		$\gamma_{8.5}$		n	1927	12204	70De10	67An10
1978.3(15)					19(6)						1931	12208	66Si0A	70De10
1980.9(15)					26(8)	α_o	γ_o	$\gamma_{8.5}$		n	1934	12211	70De10	67An10
1982.7(15)					25(8)	α_o	γ_o	$\gamma_{8.5}$		n	1936	12212	70De10	67An10
1985(2)							γ_o	$\gamma_{8.5}$		n	1938	12215	67An10	
1987(2)							γ_o	$\gamma_{8.5}$		n	1940	12217	67An10	
1991.7(15)					5.1(15)						1944	12221	66Si0A	70De10
1993.5(15)					5.1(15)						1946	12223	70De10	
1997.1(15)					250(75)	α_o		$\gamma_{8.5}$			1950	12226	70De10	67An10
2001.5(15)					250(75)	α_o	γ_o	$\gamma_{8.5}$		n	1954	12231	70De10	67An10
2002(2)								$\gamma_{8.5}$		n	1954	12231	67An10	
2009.5(15)					14(4)	α_o	γ_o	$\gamma_{8.5}$		n	1962	12239	70De10	67An10
2010.6(15)					20(6)		γ_o	$\gamma_{8.5}$		n	1963	12240	70De10	67An10
2017.7(15)					20(6)	α_o		$\gamma_{8.5}$			1970	12247	70De10	67An10
2019.0(15)					24(7)						1971	12248	70De10	
2023.3(15)					130(39)	α_o	γ_o	$\gamma_{8.5}$			1975	12252	70De10	67An10
2031.9(15)					23(7)	α_o	γ_o	$\gamma_{8.5}$		n	1984	12260	70De10	67An10
2037.0(15)					31(9)	α_o					1988	12265(2)	70De10	67An10
2040.0(15)					120(36)	α_o	γ_o	$\gamma_{8.5}$		n	1991	12268(2)	66Si0A	70De10
2043.8(15)					180(54)	α_o	γ_o	$\gamma_{8.5}$		n	1995	12272(2)	66Si0A	70De10
2050(2)							γ_o	$\gamma_{8.5}$		n	2001	12278		67An10
2049.3(15)					50(15)	α_o	γ_o			n	2001	12277(2)	70De10	67An10
2050.8(15)					70(21)	α_o		$\gamma_{8.5}$			2002	12279(2)	66Si0A	70De10
2055(2)								$\gamma_{8.5}$			2006	12283		67An10
2058.0(15)					270(81)	α_o				n	2009	12286(2)	66Si0A	70De10

(continued) $^{42}_{20}\mathbf{Ca}$(p)

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	$\omega\gamma_{\mathrm{pp}'}$ [eV]	$\omega\gamma_{\mathrm{p}\alpha}$	Γ_α [eV]	$S_{\mathrm{p}\gamma}$ [eV]	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.		
2060.0(15)				110(33)				γ_o	$\gamma_{8.5}$			2011	12288(2)	70De10	67An10	
2063.7(15)				78(24)			α_o	γ_o	$\gamma_{8.5}$		n	2015	12291(2)	66Si0A	70De10	
2067.4(15)				57(17)			α_o					2018	12295(2)	70De10	67An10	
2071.2(15)				78(24)			α_o	γ_o	$\gamma_{8.5}$		n	2022	12299(2)	66Si0A	70De10	67An10
2073.3(15)				58(17)			α_o					2024	12300(2)	66Si0A	70De10	67An10
2075(2)									$\gamma_{8.5}$		n	2026	12302			67An10
2077.7(15)				250(75)			α_o		$\gamma_{8.5}$		n	2028	12305(2)	66Si0A	70De10	67An10
2081.0(15)				74(22)							n	2031	12308(2)	66Si0A	70De10	67An10
2083.8(15)				79(24)			α_o	γ_o	$\gamma_{8.5}$		n	2034	12311(2)	66Si0A	70De10	67An10
2087(2)									$\gamma_{8.5}$		n	2037	12314			67An10
2089(2)									$\gamma_{8.5}$			2039	12316			67An10
2093.8(15)				200(60)			α_o	γ_o	$\gamma_{8.5}$		n	2044	12321(2)	66Si0A	70De10	67An10
2096.4(15)				210(60)			α_o					2047	12323(2)	66Si0A	70De10	67An10
2100.3(15)				160(50)			α_o	γ_o	$\gamma_{8.5}$		n	2050	12327(2)	66Si0A	70De10	67An10
2103(2)								γ_o	$\gamma_{8.5}$		n	2053	12330(2)	66Si0A	67An10	
2110(2)							α_o				n	2060	12337(2)	66Si0A	67An10	
2112(2)												2062	12339		67An10	
2114(2)							α_o				n	2064	12341		67An10	
2118(2)									$\gamma_{8.5}$		n	2068	12344(2)	66Si0A	67An10	
2122(2)							α_o	γ_o	$\gamma_{8.5}$		n	2071	12348		67An10	
2125(2)							α_o	γ_o	$\gamma_{8.5}$		n	2074	12351		67An10	
2129(2)	1^-						α_o		2500			2078	12355(3)	68Bu03	67An10	
2132(2)									$\gamma_{8.5}$			2081	12358		67An10	
2136(2)							α_o		$\gamma_{8.5}$		n	2085	12362(3)	68Bu03	67An10	
2140(2)							α_o					2089	12366		67An10	
2143(2)								γ_o	$\gamma_{8.5}$		n	2092	12369		67An10	
2146(2)							α_o		<3800			2095	12372(3)	68Bu03	67An10	
2148(2)								γ_o	$\gamma_{8.5}$		n	2097	12374(3)	68Bu03	67An10	
2152(2)							α_o					2101	12378		67An10	
2156(2)							α_o	γ_o	$\gamma_{8.5}$		n	2105	12382(3)	68Bu03	67An10	
2158(2)							α_o		<3000			2107	12383(3)	68Bu03	67An10	
2161(2)							α_o	γ_o	$\gamma_{8.5}$		n	2110	12386		67An10	
2165(2)								γ_o	1700			2113	12390(3)	68Bu03	67An10	
2172(2)	3^-						α_o	γ_o	2800			2120	12397(3)	68Bu03	67An10	
2180(3)									1700			2128	12405(3)	68Bu03		
2188(3)	0^+								3500			2136	12413(3)	68Bu03		
2208(3)									<2000			2155	12432(3)	68Bu03		
2213(3)	1^-								<3500			2160	12437(3)	68Bu03		
2225(3)												2172	12449(3)	68Bu03		
2238(3)									<7500			2185	12462(3)	68Bu03		
2282(3)									<4500			2228	12505(3)	68Bu03		
2295(3)	1^-								2800			2240	12517(3)	68Bu03		
2310(3)												2255	12532(3)	68Bu03		
2322(10)					8	10			<2500			2267	12544(10)	61Sh09	68Bu03	
2332(3)									<5500			2276	12553	68Bu03		

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_pp [eV]	$S_{\mathrm{p}\alpha_\circ}$ [eV]	$\omega\gamma_{\mathrm{pp}'}$ [eV]	$\omega\gamma_{\mathrm{p}\alpha}$ [eV]	Γ_α [eV]	$S_{\mathrm{p}\gamma}$ [eV]	Γ [eV]	S_pn [eV]	Γ_n [eV]	E_cm [keV]	E^* [keV]	Ref.	
2355(3)										<5000			2299	12576	68Bu03	
2362(10)						20	20						2306	12583	61Sh09	68Bu03
2381(3)													2324	12601	68Bu03	
2388(10)						9	10						2331	12608	61Sh09	68Bu03
2403(3)										<7000			2346	12623	68Bu03	
2433(3)										<1500			2375	12652	68Bu03	
2442(3)													2384	12661	68Bu03	
2450(10)*	$[1^-]$		8500										2392	12669	83Sa15	
2460(10)							30			<1500			2401	12678	61Sh09	68Bu03
2469(3)													2410	12687	68Bu03	
2478(10)						10	30						2419	12696	61Sh09	68Bu03
2507(10)						60							2447	12724	61Sh09	
2540(10)*	$[1^-]$						40						2480	12756	61Sh09	83Sa15
2608(10)						20	40						2546	12823	61Sh09	
2619(10)						10	30						2557	12834	61Sh09	
2631(10)						20							2568	12845	61Sh09	
2639(10)						20							2576	12853	61Sh09	
2652(10)						20	60						2589	12866	61Sh09	
2667(10)						20	50						2604	12880	61Sh09	
2680(10)						20	20						2616	12893	61Sh09	
2699(10)						20	50						2635	12912	61Sh09	
2709(10)						20							2644	12921	61Sh09	
2720(10)						30							2655	12932	61Sh09	
2724(10)							60						2659	12936	61Sh09	
2731(10)						40							2666	12943	61Sh09	
2746(10)						30	20						2681	12957	61Sh09	
2762(10)						30	70						2696	12973	61Sh09	
2783(10)						30	20						2717	12994	61Sh09	
2790(10)*	$[1^-]$		10400			30	40						2724	13000	61Sh09	83Sa15
2843(10)						50	90						2775	13052	61Sh09	
2887(10)						20	90						2818	13095	61Sh09	
2911(10)						50	70						2842	13119	61Sh09	
2922(10)						40	40						2852	13129	61Sh09	
2931(10)						30	40						2861	13138	61Sh09	
2940(10)*	$[1^-]$		11600			40	40						2870	13147	61Sh09	83Sa15
2962(10)						40	40						2891	13168	61Sh09	
2989(10)						60							2918	13195	61Sh09	
2996(10)							110						2925	13202	61Sh09	
3018(10)						110	80						2946	13223	61Sh09	
3063(10)						60	70						2990	13267	61Sh09	
3086(10)						80	50						3013	13289	61Sh09	
3115(10)						40							3041	13318	61Sh09	
3142(10)						210	60						3067	13344	61Sh09	
3152(10)						120	70						3077	13354	61Sh09	
3176(10)						90	90						3100	13377	61Sh09	

(continued) **$^{42}_{20}$Ca(p)**

$E_\circ$ [keV]	J^π	T	Γ_p [eV]	S_{pp} [eV]	$S_{p\alpha_\circ}$ [eV]	$\omega\gamma_{pp'}$ [eV]	$\omega\gamma_{p\alpha}$ [eV]	Γ_α [eV]	$S_{p\gamma}$ [eV]	Γ [eV]	S_{pn} [eV]	Γ_n [eV]	E_{cm} [keV]	E^* [keV]	Ref.
3195(10)						70	80						3119	13396	61Sh09
3225(10)						110	110						3148	13425	61Sh09
3262(10)						70							3184	13461	61Sh09
3300(10)						110							3221	13498	61Sh09
3320(10)						60							3241	13518	61Sh09
3336(10)						80							3257	13533	61Sh09
3269(10)						80							3191	13468	61Sh09
3389(10)						70							3308	13585	61Sh09
3402(10)						100							3321	13598	61Sh09
3414(10)						120							3333	13610	61Sh09
3700(10)*													3612	13889	83Sa15
3860(10)*													3768	14045	83Sa15

Additional data on this isotope can be found in [71Vi14, 70De11, 68An0A, 67An10, 67Lu08, 67Na10, 66En04, 59Sh61].

* possible IAR-resonances from ^{41}K(p,n)^{41}Ca reaction [83Sa15]

Values $S_{p\gamma}$ are relative strengths of [62Si13] normalized to the strength of the 1111 keV resonance [67En05].

From positions of strong (p,α)-resonances at $E_\circ$=2000 and 2080 keV in [70De10] and [67An10] a shift in $E_\circ$ up to 4 keV could be determined; this shift was not introduced in values $E_\circ$.

Proton reduced widths θ_p^2, α-particle reduced widths θ_α^2 and E^*_{analog} are given in [70De11].

For resonances at $E_\circ$=1559, 1566, 1572 keV parameters are given for spin J^π=1$^-$ [70De11].

$\gamma_\circ$ and $\gamma_{8.5}$ mark presence of transitions to the ground state and with E_γ>8.5 MeV.

$\omega\gamma(pp')$ from the yield of 1.0 Mev γ-rays corresponding to proton inelastic scattering [61Sh09].

$\omega\gamma(p\alpha)$ from the yield of 2.16 Mev γ-rays corresponding to ^{41}K(p,$\alpha\gamma$) reaction [61Sh09].

Target isotope: $^{38}_{18}$Ar $I^\pi_\circ = 0^+$ *Abundance:* 0.0632(5) % Q_α = 6256.91(52) keV **$^{42}_{20}$Ca(α)**

$E_\circ$ [keV]	J^π	$S_{\alpha\gamma}$ [eV]	Γ_γ [eV]	E_{cm} [keV]	E^* [keV]	Ref.
3158(5)		0.43(13)		2857(5)	9114(5)	67Na10
3242(5)		0.42(13)		2933(5)	9190(5)	67Na10
3340(5)	1$^-$	1.49(45)	>0.50	3022(5)	9279(5)	67Na10
3436(5)		0.78(23)		3109(5)	9366(5)	67Na10
3501(5)		1.48(44)		3168(5)	9424(5)	67Na10
3551(5)		0.83(25)		3213(5)	9470(5)	67Na10
3651(5)		0.76(23)		3303(5)	9560(5)	67Na10
3732(5)		0.53(16)		3377(5)	9633(5)	67Na10
3773(5)		0.47(14)		3414(5)	9671(5)	67Na10
3893(5)		0.75(23)		3522(5)	9779(5)	67Na10
3830(5)		0.75(23)		3465(5)	9722(5)	67Na10
3867(5)		2.05(62)		3499(5)	9756(5)	67Na10

(continued) $^{42}_{20}\mathbf{Ca}(\alpha)$

$E_\circ$ [keV]	J^π	$S_{\alpha\gamma}$ [eV]	Γ_γ [eV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.
3897(5)		0.75(23)		3526(5)	9783(5)	67Na10
3992(5)		1.44(43)		3612(5)	9869(5)	67Na10
4077(5)		1.74(52)		3689(5)	9946(5)	67Na10
4178(5)		0.62(19)		3780(5)	10037(5)	67Na10
4362(5)		0.85(26)		3947(5)	10203(5)	67Na10
4391(5)		0.57(17)		3973(5)	10230(5)	67Na10
4448(5)	1^-	2.81(84)	>0.94	4024(5)	10281(5)	67Na10
4483(5)		1.23(37)		4056(5)	10313(5)	67Na10
4532(5)	1^-	2.23(67)	>0.74	4100(5)	10357(5)	67Na10
4566(5)		0.99(30)		4131(5)	10388(5)	67Na10
4637(5)		1.68(50)		4195(5)	10452(5)	67Na10
4688(5)	1^-	2.13(64)	>0.71	4242(5)	10498(5)	67Na10
4718(5)		0.50(15)		4269(5)	10526(5)	67Na10
4756(5)		0.53(16)		4303(5)	10560(5)	67Na10
4786(5)		1.16(35)		4330(5)	10587(5)	67Na10
4812(5)		0.83(25)		4354(5)	10611(5)	67Na10
4835(5)		3.65(110)		4375(5)	10631(5)	67Na10
4857(5)		0.45(14)		4394(5)	10651(5)	67Na10
4880(5)	1^-	1.32(40)	>0.44	4415(5)	10672(5)	67Na10
4910(5)		0.98(29)		4442(5)	10699(5)	67Na10
4938(5)	1^-	1.74(52)	>0.58	4468(5)	10725(5)	67Na10
5001(5)	1^-	2.54(76)	>0.85	4525(5)	10782(5)	67Na10
5026(5)	1^-	4.29(129)	>1.43	4547(5)	10804(5)	67Na10
5067(5)	1^-	5.37(161)	>1.79	4584(5)	10841(5)	67Na10
5113(5)	1^-	2.89(87)	>0.96	4626(5)	10883(5)	67Na10
5136(5)	1^-	2.69(81)	>0.90	4647(5)	10904(5)	67Na10
5148(5)	1^-	2.69(81)	>0.90	4658(5)	10915(5)	67Na10
5206(5)		0.85(26)		4710(5)	10967(5)	67Na10
5225(5)		0.90(27)		4727(5)	10984(5)	67Na10
5255(5)	1^-	3.46(104)	>1.15	4755(5)	11011(5)	67Na10
5294(5)		1.28(38)		4790(5)	11047(5)	67Na10
5325(5)	1^-	1.91(57)	>0.64	4818(5)	11075(5)	67Na10
5361(5)	1^-	1.68(50)	>0.56	4850(5)	11107(5)	67Na10
5406(5)	1^-	2.51(75)	>0.84	4891(5)	11148(5)	67Na10
5446(5)	1^-	0.99(30)	>0.33	4927(5)	11184(5)	67Na10
5488(5)	1^-	2.63(79)	>0.88	4965(5)	11222(5)	67Na10
5550(5)		1.05(32)		5021(5)	11278(5)	67Na10
5574(5)		1.21(36)		5043(5)	11300(5)	67Na10
5613(5)	1^-	8.10(243)	>2.70	5078(5)	11335(5)	67Na10
5659(5)	1^-	2.43(73)	>0.81	5120(5)	11377(5)	67Na10
5682(5)		0.62(19)		5141(5)	11398(5)	67Na10
5729(5)	1^-	1.65(50)	>0.55	5183(5)	11440(5)	67Na10
5782(5)	1^-	2.84(85)	>0.95	5231(5)	11488(5)	67Na10
5815(5)		0.66(20)		5261(5)	11518(5)	67Na10
5843(5)	1^-	1.59(48)	>0.53	5287(5)	11543(5)	67Na10

(continued) $^{42}_{20}\mathbf{Ca}(\alpha)$

$E_\circ$ [keV]	J^π	$S_{\alpha\gamma}$ [eV]	Γ_γ [eV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.
5918(5)		2.00(60)		5354(5)	11611(5)	67Na10
5972(5)		0.59(18)		5403(5)	11660(5)	67Na10

Additional data on this isotope can be found in [76Fo04].
All data are form [67Na10].
There is a ±30% error in the relative strehgths and a factor of 2 error in the absolute values $S_{\alpha\gamma}$ [67Na10].
The resonance at $E_\circ$=4688 keV is a doublet.

Branching ratios of γ-transitions [90En08, 71Vi14]. Part 1. $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

E^* [keV]	J^π	T	Branching ratios Percentage												
E^*			0.0	1525	1837	2424	2752	3189	3254	3300	3392	3447	3654	3885	3954
J^π_f			0^+	2^+	0^+	2^+	4^+	6^+	4^+	0^+	2^+	3^-	2^+	1^-	4^-
1524.70(3)	2^+		100												
1837.3(3)	0^+		2.05(17)	97.95(17)											
2424.17(4)	2^+		30(1)	70(1)	<0.5										
2752.41(4)	4^+			99.0(4)		1.0(10)									
3189.44(8)	6^+						100								
3253.88(5)	4^+			55(5)		10(5)	35(5)								
3300(1)	0^+			8(2)		92(2)									
3392(1)	2^+		40(2)	43(4)	7(1)	10(5)									
3446.94(5)	3^-		<2	60(2)		35(2)	5(1)								
3654(1)	2^+		18(1)	74(2)	5(3)	3(1)									
3885(1)	1^-		60(7)		40(7)										
3954.39(6)	4^-						15(1)					85(3)			
3999.67(10)	2^+,3			64(3)		30(3)	6(3)								
4047(2)	3^-			56(6)		17(6)	15(5)					12(2)			
4099.71(10)	5^-						33(2)	67(2)							
4117(1)	3^-			62(7)								38(7)			
4180(2)	0														
4232(1)	1		78(3)			22(3)									
4342.3(14)	0^+–4^+														
4354(1)	4^-						55(5)		11(3)			29(5)			5(2)
4418(2)	3^-			52(7)		13(4)						35(6)			
4443(2)	4^+					13(3)	79(4)		8(2)						
4448.8(17)	2^+		23(5)	35(6)	17(4)							13(3)	12(2)		
4505(2)	$\langle 2$–$4\rangle^+$			47(6)			30(5)		7(2)		16(3)				
4567(2)	$\langle 1,2^+\rangle$					68(6)								32(6)	
4666(10)	$\langle 3,4\rangle^-$														

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

E^* [keV]	J^π	T	$E_\circ$ [keV]	Branching ratios Percentage												
E^*				0.0	1525	1837	2424	2752	3189	3254	3300	3392	3447	3654	3885	3954
J^π_f				0^+	2^+	0^+	2^+	4^+	6^+	4^+	0^+	2^+	3^-	2^+	1^-	4^-
4690.07(12)	3^-				82(5)		18(5)									
4715(1)	$\langle 6^+ \rangle$							48(3)	7(2)	45(3)						
4720(10)	$\langle 3,4 \rangle^-$															
4759.9(3)	2^+			35(10)	30(10)	15(5)	20(10)									
4866(2)	2^+				18(7)		82(7)									
4896(1)	5^-												14(3)			
4904(2)	3^-			55(10)			25(5)	20(5)								
4947(2)	$\langle 1–3 \rangle^-$						100									
4971(2)	3^-				33(6)		35(6)									32(5)
5017.04(13)	4^+				16(3)					84(5)						
5075(2)	$\langle 1–3 \rangle^-$												68(7)			
5158(2)	3^-				54(9)		46(9)									
5188(2)	$\langle 2–4 \rangle^+$															
5210(2)	$\langle 2^+ \rangle$							12(4)		88(4)						
5214(2)	$0^+–4^+$				24(5)		15(4)									
5320(2)	$\langle 3,4 \rangle^-$									6(2)						38(5)
5345(2)	0^+				100											
5358(2)	2^+			75(15)			25(15)									
5380(2)	5^-							42(6)	36(5)	22(4)						
5393(2)	$\langle 1–3 \rangle^-$				75(9)		25(9)									
5407(4)	3^-															
5439(2)	$\langle 3,4 \rangle^-$															
5466(5)	$\langle 1–5 \rangle^-$				10(3)			27(3)		63(6)						
5472(2)	$\langle 2–4 \rangle^+$															
5491(2)	3^-				31(9)											
5491.2(2)	6^-								100							
5510(2)	3^-												68(8)			
5530(2)	2^+				30(9)		70(9)									
5578(2)	$0^+–4^+$											100				
5593(2)	3^-				25(7)		27(4)									48(7)
5601(2)	$\langle 3,4 \rangle^-$															
5624(2)	3^-			33(8)												
5665(2)	3^-						32(6)									45(7)
5670(2)	$\langle 1–4 \rangle$				44(9)								56(9)			
5690(2)	$4^+,5^-$											14(4)	39(6)			
5716(2)	2^+												100			
5725(2)	$2^+–6^+$							100								
5738(2)	$1,2^+$															
5744.3(2)	7^-											46(3)				
5769(2)	3^-						37(7)	63(7)								
5775(2)	$\langle 4,5 \rangle^+$								11(3)	89(3)						
5797(2)	$\langle 1,2 \rangle^+$			33(7)	28(6)		39(7)									

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

E^* [keV]	J^π	T	$E_\circ$ [keV]	Branching ratios Percentage											
E^*				0.0	1525	1837	2424	2752	3189	3254	3300	3392	3447	3654	3885	3954
J^π_f				0^+	2^+	0^+	2^+	4^+	6^+	4^+	0^+	2^+	3^-	2^+	1^-	4^-
5806(2)	3^-															
5822(2)	$\langle 1\text{–}3\rangle^-$						100									
5866(2)	0^+				45(10)	55(10)										
5875(2)	2^+						71(8)	29(8)								
5924(2)	$\langle 3,4\rangle^-$							20(4)								21(4)
5927(2)	$4^+\text{–}8^+$								100							
5952(10)	$\langle 3,4\rangle^-$															
5980(5)	3^-															
5994(2)	3^-						83(5)									
6003(2)	$3^-,4^-$							100								
6017(5)	4^+								81(6)							19(6)
6020(2)	$\langle 4\text{–}6\rangle$															
6028(2)	$\langle 3\rangle^-$				16(5)			44(7)								40(7)
6038(2)	$\langle 1\text{–}3\rangle^-$				75(6)		25(6)									
6093(2)																
6103(2)					44(8)		56(8)									
6113(2)	4^+									86(4)						
6141(2)	6^-															50(5)
6145.1(2)	7^-								100							
6158(3)	3^-															
6182(4)	$\langle 1,2^+\rangle$			32(9)	68(9)											
6212(2)	$\langle 3,4\rangle^-$							100								
6239(3)	3^-															
6248(2)	$\langle 4\text{–}6\rangle$							32(5)	39(6)							29(5)
6273(10)	2^+															
6315(10)	$\langle 2\text{–}5\rangle^+$															
6392(10)	$\langle 3,4\rangle^-$															
6408.0(2)	8^-								12(2)							
6426(10)	$\langle 2\text{–}5\rangle^+$															
6460(10)	$\langle 3,4\rangle^-$															
6510(10)																
6542(2)	5^+								58(6)							
6554.0(2)	9^-															
6585(2)																
6635(2)	$4,6,8^+$								14(3)							
6675(2)	$4^+\text{–}8^+$								100							
6715(2)	$\langle 4^+\rangle$								27(5)							
6746(2)	$\langle 3\rangle^+$															
6780(10)																
6817(2)	$\langle 4,5\rangle^+$								100							
6896(2)	4^+								71(4)							
6920(4)	$\langle 3,4\rangle^+$															

(continued) $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

E^* [keV]	J^π	T	$E_\circ$ [keV]	Branching ratios Percentage												
E^*				0.0	1525	1837	2424	2752	3189	3254	3300	3392	3447	3654	3885	3954
J^π_f				0^+	2^+	0^+	2^+	4^+	6^+	4^+	0^+	2^+	3^-	2^+	1^-	4^-
6931(7)	$\langle 2,3\rangle^+$															
6940(2)	$\langle 5–7\rangle$															
6961(15)	$\langle 3,4\rangle^+$															
6975(2)	$\langle 5^+\rangle$								45(5)							
7030(10)	4^+															
7041(15)	$3^-,4^-$															
7103(7)	$\langle 1–4\rangle^-$															
7130(2)	4^+								100							
7153(7)	$3^+,4^+$															
7198(2)									100							
7228(7)	$\langle - \rangle$															
7270(15)	$3^+,4^+$															
7282(2)																
7345(2)																
7348(15)	$3^+,4^+$															
7361(2)																
7368.0(2)	10^-															
7389(2)	4^+								100							
7415(2)																
7420(2)									75(4)							
7468(15)																
7520(15)	$\langle 3,4\rangle^+$															
7542(2)	$\langle 4–7\rangle$								24(7)							
7560(2)																
7634(2)	$\langle 4^+\rangle$								28(4)							
7697(2)	$\langle 4^+\rangle$								100							
7724(2)																
7750(1)	$\langle 11\rangle^-$															
7758(2)	$\langle 6^-\rangle$															
7760(15)	$\langle 3,4\rangle^+$															
7793(15)	$\langle 3,4\rangle^+$															
7801(2)	$5^–9^-$															
7838(2)																
7920(2)	$4^+–8^+$								38(8)							
7940(2)	$4^+–7^-$								57(7)							
8050(2)																
8060(2)	$6^–9^-$															
8083(2)	X^-															
8102(2)																
8297(1)	$\langle 11\rangle^-$															
8365(2)	$\langle 6–8\rangle$								43(10)							
8450(2)	$\langle 7,8\rangle^-$															

(continued) $^{42}_{20}$Ca(p)

E^* [keV]	J^π	T	$E_\circ$ [keV]	Branching ratios Percentage												
E^*				0.0	1525	1837	2424	2752	3189	3254	3300	3392	3447	3654	3885	3954
J^π_f				0^+	2^+	0^+	2^+	4^+	6^+	4^+	0^+	2^+	3^-	2^+	1^-	4^-
8512(2)	6^-–9^-															
8517(2)																
8522(1)	X^-															
8580(2)																
8611(2)																
8745(2)	8^-–12^-															
8774(2)	4^+,5^-															
8847(2)																
8950(2)																
9037(2)	8^-–12^-															
9206(2)	5^-–9^-															
9270																
9378(2)	5^-–9^-															
9750(2)	$\langle 2^- \rangle$															
9760(2)	7^-–11^-															
9770	$\langle 2^+ \rangle$															
9842(2)	$\langle 5,6 \rangle^-$															
10036(2)	5^-–9^-															
10450	X^-	2														
11235(5)	$\langle 1^+ \rangle$															
11644			1402	14	32	4	5					3		6	6	
11667			1425		16	29	17					9		8		
11672			1431		26	14	14					17				
11692			1451		9		21				3	13		15		
11705			1464	9	14	25	8				3	6		8	5	
11726			1486	15	14	10	14				6	6		3		
11739			1499	5	5	2						11		6	10	
11742			1502	8	34	9						27				
11774			1535	6	5		16					13	21		6	
11795			1557	17	8	11	22					24	6			
11804			1566	4	4		3					11	5			
11822			1584	4	23	9	12					13		14		
11838			1601		19		9				8			12		
11867			1630	9	8	5	15					13		11		
11870			1633	11	8	5	17					5			12	
11876			1640	2	18	5	8					6			11	
11978			1744	24	38		8				8	3	2	7		

Branching ratio of the transition between the 0^+ levels with $E_\circ$=5866 keV and 1837 keV is considered as presumably erroneous in Errata and Addenda II to [90En08] Nucl. Phys. A **564** (1993).

Branching ratios of γ-transitions [90En08, 71Vi14]. Part 2. $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	$E_\circ$	Branching ratios															
[keV]	[keV]	Percentage															
E^*		4000	4047	4100	4117	4180	4232	4342	4354	4418	4443	4449	4505	4567	4715	4760	4866
J^π_f		2^+,3	3^-	5^-	3^-	0	1	X^+	4^-	3^-	4^+	2^+	X^+		$\langle X^- \rangle$	2^+	2^+
4896				80(3)	6(1)												
5075										32(7)							
5188										100							
5214		61(5)															
5320			10(2)	23(4)						23(4)							
5439				100													
5491					69(9)												
5510			32(8)														
5601		67(10)											35(10)				
5624		55(8)	12*														
5665										23(5)							
5744.3				54(3)													
5806		100															
5924				37(3)					12(3)				10(3)				
6093				32(5)													
6113										14(4)							
6141				⟨16⟩					26(6)								
6542				17(4)													
6746				49(9)													
6940				34(5)													
6975				27(4)											12(3)		
10450				>60													
11644	1402		6		6		16					2					
11667	1425				10							11					
11672	1431				29												
11692	1451				7		13									19	
11705	1464						9	5									
11726	1486				7		7			4		10				4	
11739	1499				22		7					4					
11742	1502				10		12										
11774	1535	16			4		6							7			
11795	1557				12												
11804	1566		15					21		11		8					
11822	1584						25										
11838	1601																31
11867	1630		13		13												
11870	1633		8		14												
11876	1640		9		9		32										
11978	1744											9					

* transition to the unknown level

Branching ratios of γ-transitions. Part 3. $^{42}_{20}\mathbf{Ca}(\mathrm{p})$

E^*	$E_\circ$	Branching ratios															
[keV]	[keV]	Percentage															
E^*		4896	4904	4971	5210	5358	5491	5593	5690	5738	5930	6150	6408	6554	6635	6715	7368
J^π_f		5^-	3^-	3^-	$\langle 2^+\rangle$	2^+	6^-	3^-	4,5	$1,2^+$		3^-	8^-	9^-	X^+	$\langle 4^+\rangle$	10^-
5994				17(5)													
6093		68(5)															
6141							8(3)										
6408.0							72(2)					16(1)					
6542							25(4)										
6554.0										87(2)			13(2)				
6585							46(6)			54(6)							
6715					40(5)												
6746		51(9)															
6896							6(2)				23(4)						
6940		46(6)								20(4)							
6975							16(3)										
7282													74(4)	26(4)			
7345													100				
7361												100					
7368.0														100			
7634									19(3)		18(3)						
7758		26(4)					32(4)			24(4)			18(3)				
7801												100					
7940									43(7)								
8060										6(2)			94(2)				
8083														100			
8102									33(5)								
8297.5														44(6)			56(6)
8365													57(10)				
8450							42(5)						29(5)	29(5)			
8512										53(7)			47(7)				
8517											100						
11705	1464							8									
11739	1499		18		10												
11804	1566							18									
11838	1601			21													
11867	1630		13														
11870	1633					10				10							