^{40}Ca(μ^-,$\nu\gamma$) 2006Me08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 140, 1 (2017)	30-Sep-2015

2006Me08: The μ^- beam was obtained from decay of π^- beam at 90 MeV/c provided by the beamline M9B at TRIUMF. Target was pure natural calcium. γ rays were detected with two HPGe detectors. Measured Eγ, Iγ, E(x ray), I(x ray). Deduced levels, γ-ray yields.

Muonic Lyman series for natural Calcium

μ x ray	Energy	Intensity in percent
2p-1s	783.659 *25*	83.8 *10*
3p-1s	940.63 *10*	6.2 *2*
4p-1s	995.48 *10*	2.0 *1*
5p-1s	1020.81 *10*	2.0 *1*
6p-1s	1034.62 *10*	1.8 *1*
7p-1s	1042.71 *20*	1.4 *1*
(8-∞)p-1s	1046-1063	2.8 *4*

Muonic Balmer series for natural Calcium

μ x ray	Energy	Intensity in percent
3d-2p	157.35 *13*	64.5 *9*
4d-2p	212.03 *10*	8.85 *20*
5d-2p	237.31 *10*	4.34 *20*
6d-2p	251.06 *10*	3.29 *20*
7d-2p	259.45 *10*	1.37 *20*
(8-∞)d-2p	261-277	1.4 *3*

^{40}K Levels

E(level)[†]	J$^\pi$[‡]	Percent Yield per muon capture[#]	Comments
0	4^-		
29.83	3^-		
800.14	2^-	5.0 *5*	Known cascading=2.8% *5*.
891.40	5^-	0.2 *1*	Known cascading=0.03% *2*.
1643.64	0^+	0.5 *4*	Known cascading=0.37% *15*.
1959.07	2^+	1.2 *2*	Known cascading=0.04% *2*.
2047.35	2^-	0.9 *3*	
2069.81	3^-	0.7 *3*	
2103.67	1^-	0.7 *2*	Known cascading=0.43% *6*.
2260.40	3^+	<0.25	
2289.87	1^+	0.5 *2*	
2290.49	3^-	<0.24	
2397.17	4^-	<0.3	
2419.17	2^-	0.4 *3*	
2625.99	0^-	0.60 *8*	
2730.37	1	<0.24	
2807.88	$(1,2)^-$	0.34 *21*	
3228.67	2^-	<0.8	
3868.66	2^-	<0.9	
3887.92	$(1^-,2^-)$	<0.6	

Continued on next page (footnotes at end of table)

^{40}Ca(μ^-,$\nu\gamma$) 2006Me08 (continued)

^{40}K Levels (continued)

E(level)[†]	Jπ[‡]	Percent Yield per muon capture[#]
3923.90	$(2^-,3^+)$	<1.0
4537.06	(2^-)	0.9 *4*

† As listed in 2006Me08 from literature.
‡ From Adopted Levels.
# Corrected for known cascading.

γ(^{40}K)

E_γ[†]	Percent γ-ray yield	E_i(level)	J_i^π	E_f	J_f^π	Mult.
522.32	0.43 *6*	2625.99	0^-	2103.67	1^-	
646.22	0.37 *15*	2289.87	1^+	1643.64	0^+	
770.31	7.8 *3*	800.14	2^-	29.83	3^-	
843.49	0.3 *2*	1643.64	0^+	800.14	2^-	
891.37	0.23 *10*	891.40	5^-	0	4^-	
938.72	‡	3228.67	2^-	2289.87	1^+	
1086.71	<0.2	2730.37	1	1643.64	0^+	
1158.90	0.85 *15*	1959.07	2^+	800.14	2^-	
1247.17	0.35 *12*	2047.35	2^-	800.14	2^-	
1303.53	0.30 *8*	2103.67	1^-	800.14	2^-	
1399.03	<0.1	2290.49	3^-	891.40	5^-	
1489.77	0.11 *8*	2289.87	1^+	800.14	2^-	
1613.84	0.5 *2*	1643.64	0^+	29.83	3^-	[E3]
1619.00	0.3 *2*	2419.17	2^-	800.14	2^-	
1765.24	<0.25	3868.66	2^-	2103.67	1^-	
1825.77	0.16 *6*	2625.99	0^-	800.14	2^-	
1929.34	0.31 *15*	1959.07	2^+	29.83	3^-	
2007.71	0.32 *20*	2807.88	$(1,2)^-$	800.14	2^-	
2017.53	0.29 *14*	2047.35	2^-	29.83	3^-	
2039.94	0.35 *17*	2069.81	3^-	29.83	3^-	
2047.28	0.26 *10*	2047.35	2^-	0	4^-	
2070.08	0.27 *10*	2069.81	3^-	0	4^-	
2073.74	0.76 *18*	2103.67	1^-	29.83	3^-	
2230.54	<0.2	2260.40	3^+	29.83	3^-	
2290.58	<0.2	2290.49	3^-	0	4^-	
2367.17	<0.2	2397.17	4^-	29.83	3^-	
2389.18	0.1 *1*	2419.17	2^-	29.83	3^-	
2397.12	<0.4	2397.17	4^-	0	4^-	
2428.28	<0.3	3228.67	2^-	800.14	2^-	
3068.7	<0.4	3868.66	2^-	800.14	2^-	
3088.3 *5*	<0.3	3887.92	$(1^-,2^-)$	800.14	2^-	
3198.6	<0.25	3228.67	2^-	29.83	3^-	
3737.01	0.4 *2*	4537.06	(2^-)	800.14	2^-	
3838.50	<0.4	3868.66	2^-	29.83	3^-	
3857.97	<0.3	3887.92	$(1^-,2^-)$	29.83	3^-	
3895.7	<0.4	3923.90	$(2^-,3^+)$	29.83	3^-	
4506.96	<1	4537.06	(2^-)	29.83	3^-	

† As listed in 2006Me08 from literature.
‡ Intensity not listed by 2006Me08, the peak is overlapped by other transitions.

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Level Scheme

Intensities: Percent γ-ray yield/muon capture

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$