

$^{40}\text{Ca}(\mu^{-},\nu 2p\gamma)$  2006Me08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 152, 1 (2018)	30-Sep-2017

2006Me08: the  $\mu^{-}$  beam was obtained from decay of  $\pi^{-}$  beam at 90 MeV/c provided by the beamline M9B at TRIUMF. Targets were pure natural calcium turnings with some oxide on the surface.  $\gamma$  rays were detected with two HPGe detectors. Measured  $E_{\gamma}$ ,  $I_{\gamma}$ ,  $E(x \text{ ray})$ ,  $I(x \text{ ray})$ ,  $\gamma\gamma$ -coin., Deduced levels, muon capture yields.

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Muonic Lyman series for natural Calcium

$\mu$ 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- $\infty$ )p-1s	1046-1063	2.8 4

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Muonic Balmer series for natural Calcium

$\mu$ 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- $\infty$ )d-2p	261-277	1.4 3

 $^{38}\text{Cl}$  Levels

<u>E(level)<sup>†</sup></u>	<u>J<sup><math>\pi</math></sup></u>
0	2 <sup>-</sup>
671.4	5 <sup>-</sup>
755.4	3 <sup>-</sup>
1309.1	4 <sup>-</sup>
1617.4	3 <sup>-</sup>

<sup>†</sup> From Adopted Levels. Energies are round-off values. Population of levels above the 671 level is considered as uncertain in view of only the upper limits of intensities of  $\gamma$  rays from these levels.

 $\gamma(^{38}\text{Cl})$ 

<u>E<sub><math>\gamma</math></sub><sup>†</sup></u>	<u>Percent <math>\gamma</math>-ray yield</u>	<u>E<sub>i</sub>(level)</u>	<u>J<sub>i</sub><sup><math>\pi</math></sup></u>	<u>E<sub>f</sub></u>	<u>J<sub>f</sub><sup><math>\pi</math></sup></u>
308.4	‡	1617.4	3 <sup>-</sup>	1309.1	4 <sup>-</sup>
553.6	<0.3	1309.1	4 <sup>-</sup>	755.4	3 <sup>-</sup>
637.7	<0.25	1309.1	4 <sup>-</sup>	671.4	5 <sup>-</sup>
671.4		671.4	5 <sup>-</sup>	0	2 <sup>-</sup>
755.4	<0.1	755.4	3 <sup>-</sup>	0	2 <sup>-</sup>

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${}^{40}\text{Ca}(\mu^{-}, \nu 2p\gamma)$  **2006Me08** (continued) $\gamma({}^{38}\text{Cl})$  (continued)

$E_{\gamma}^{\dagger}$	Percent $\gamma$ -ray yield	$E_i(\text{level})$	$J_i^{\pi}$	$E_f$	$J_f^{\pi}$
862.0	<0.2	1617.4	$3^{-}$	755.4	$3^{-}$
1308.8	<0.17	1309.1	$4^{-}$	0	$2^{-}$

$\dagger$  Round-off values from Adopted Gammas.

$\ddagger$  Intensity not listed by **2006Me08**, the peak is overlapped by other transitions.

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## Level Scheme

Intensities: Percent  $\gamma$ -ray yield/muon capture

## Legend

- $I_{\gamma} < 2\% \times I_{\gamma}^{\text{max}}$
- $I_{\gamma} < 10\% \times I_{\gamma}^{\text{max}}$
- $I_{\gamma} > 10\% \times I_{\gamma}^{\text{max}}$

