

${}^{40}\text{Sc}$ εp decay (182.3 ms) 1982Ho09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

Parent: ${}^{40}\text{Sc}$: $E=0$; $J^\pi=4^-$; $T_{1/2}=182.3$ ms 7; $Q(\varepsilon\text{p})=5994.9$ 28; $\% \varepsilon\text{p}$ decay=0.44 7

${}^{40}\text{Sc}$ - $J^\pi, T_{1/2}$: From Adopted Levels of ${}^{40}\text{Sc}$. Half-lives from εp decay measurements in this dataset: 182.4 ms 18 from proton groups and 183 ms 7 from alpha groups in 1982Ho09, 178 ms 8 from 1969Ve04.

${}^{40}\text{Sc}$ - $Q(\varepsilon\text{p})$: From 2017Wa10.

${}^{40}\text{Sc}$ - $\% \varepsilon\text{p}$ decay: From 1982Ho09.

1982Ho09: Ions of ${}^{40}\text{Sc}$ were produced via ${}^{40}\text{Ca}(\text{p},\text{n})$ with 20 MeV protons from the University of Jyvaskyla MC-20 cyclotron incident on self-supporting natural calcium targets of about 1 mg/cm². β -delayed particles were detected with Si(Au) surface-barrier detectors and γ rays were detected with a γ -ray detector. Measured $E(\text{p})$, $I(\text{p})$, $E(\alpha)$, $I(\alpha)$, particle- γ -coin, decay-time distributions of proton and alpha groups. Deduced delayed-particle decay branchings, parent $T_{1/2}$, levels in ${}^{40}\text{Ca}$.

Others:

1974Se11 (also 1973SeYM): measured $E(\text{p})$, $I(\text{p})$, $T_{1/2}$.

1969Ve04: measured $E(\text{p})$, $I(\text{p})$, $T_{1/2}$.

All data are from 1982Ho09, unless otherwise noted. Data are also available in 1974Se11 and 1969Ve04, but are less complete and less precise.

 ${}^{39}\text{K}$ Levels

<u>$E(\text{level})$</u>	<u>J^π</u>
0	$3/2^+$

Delayed Protons (${}^{39}\text{K}$)

<u>$E(\text{p})$</u>	<u>$E({}^{39}\text{K})$</u>	<u>$I(\text{p})^{\dagger\#}$</u>	<u>$E({}^{40}\text{Ca})^{\ddagger}$</u>	<u>Comments</u>
1006 3	0	0.072 11	9363	
1060 8	0	0.044 8	9419	
1071 6	0	0.055 10	9429	
1095 3	0	0.110 17	9454	
1241 3	0	0.032 5	9603	
1445 4	0	0.0088 15	9811	
1463 8	0	0.0026 7	9829	$I(\text{p})$: intensity pertains to 9835 intermediate state, in addition to 9829 intermediate state.

Continued on next page (footnotes at end of table)

^{40}Sc εp decay (182.3 ms) 1982Ho09 (continued)Delayed Protons (continued)

E(p)	E(^{39}K)	I(p) ^{†#}	E(^{40}Ca) [‡]	Comments
1552 3	0	0.0050 9	9921	
1609 5	0	9×10 ⁻⁴ 5	9977	
1678 4	0	0.0042 9	10049	
1752 4	0	0.0013 4	10131	
1835 4	0	0.0139 22	10211	
1953 4	0	4.6×10 ⁻⁴ 20	10334	
1986 8	0	3.0×10 ⁻⁴ 20	10361	
2065 4	0	0.0028 5	10447	
2089 4	0	0.0094 14	10470	
2121 4	0	0.0125 19	10503	
2197 5	0	0.0017 4	10582	
2211 10	0	3.5×10 ⁻⁴ 20	10596	
2305 5	0	8×10 ⁻⁴ 3	10670	
2365 8	0	9×10 ⁻⁴ 3	10754	
2386 5	0	0.0128 20	10781	
2423 9	0	8×10 ⁻⁴ 3	10814	
2457 5	0	0.0038 2	10848	
2516 5	0	3.5×10 ⁻⁴ 20	10910	
2562 8	0	0.0020 4	10956	
2578 7	0	0.0020 4	10976	
2641 7	0	6.9×10 ⁻⁴ 20	11037	
2716 6	0	0.0011 3	11117	I(p): could be for 11117+11119 intermediate states.
2743 6	0	0.0023 4	11142	
2816 5	0	0.0068 11	11217	
2912 5	0	5.1×10 ⁻⁴ 20	11311	
3012 7	0	2.8×10 ⁻⁴ 20	11415	
3045 9	0	8.3×10 ⁻⁴ 20	11455	I(p): could be for 11451+11455 intermediate states.
3205 10	0	2.4×10 ⁻⁴ 10	11616	
3308 10	0	7×10 ⁻⁴ 3	11726	
3376 10	0	2.6×10 ⁻⁴ 20	11799	
3584 10	0	1.0×10 ⁻⁴ 10	12000	
3613 10	0	2.4×10 ⁻⁴ 10	12038	
3649 10	0	1.2×10 ⁻⁴ 10	12068	

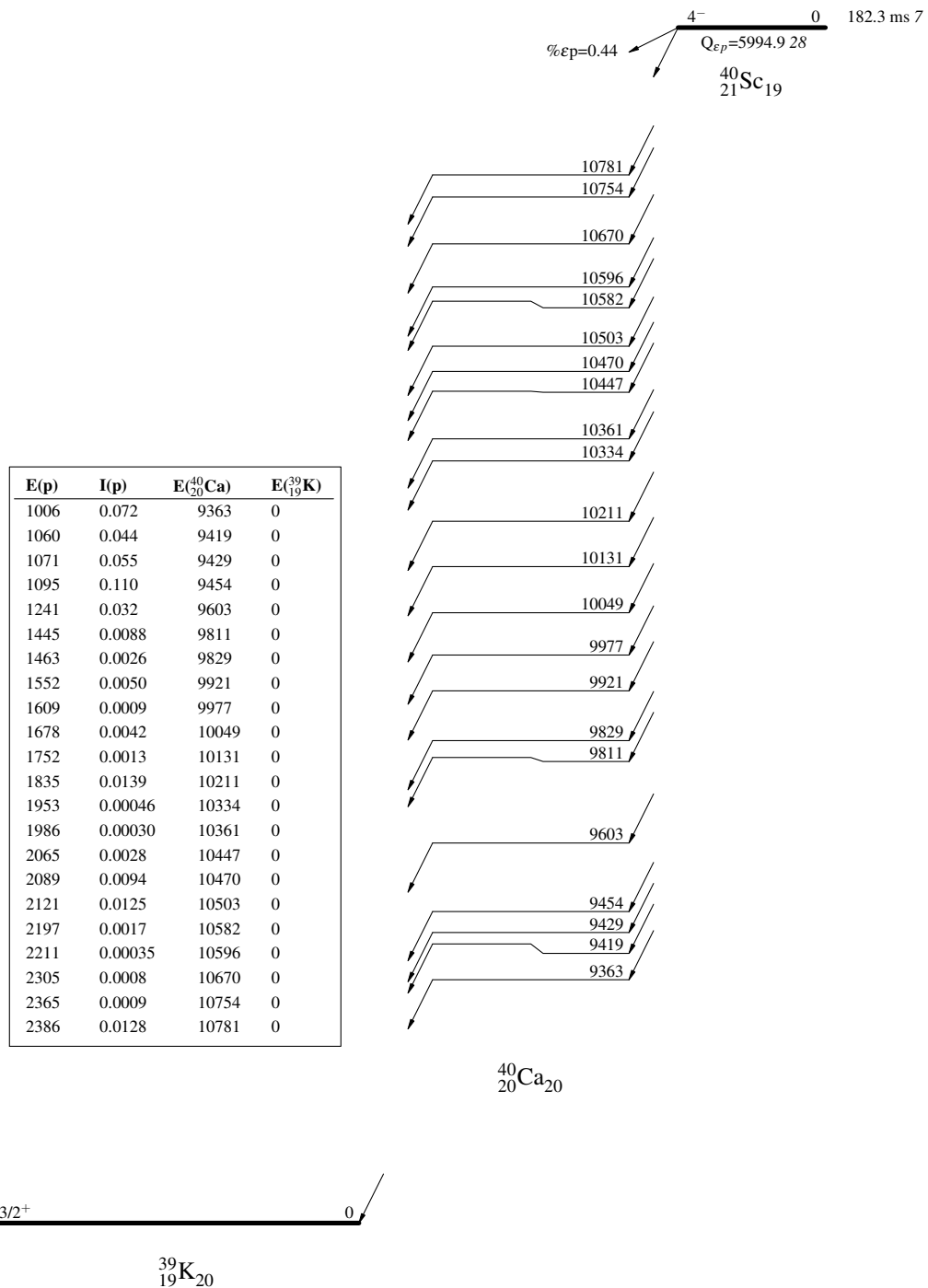
[†] From 1982Ho09. Note that the sum of I(p) of all proton groups is 0.415 26 per 100 parent decays, about 6% less than the ^{40}Sc decay branching $\% \varepsilon\text{p}=0.44 7$ reported in 1982Ho09 from the integrated absolute proton intensity relative to measured γ -ray intensities in ^{40}Ca .

[‡] Rounded-off values from Adopted Levels of ^{40}Ca .

[#] Absolute intensity per 100 decays.

${}^{40}\text{Sc}$ ϵp decay (182.3 ms) 1982Ho09Decay Scheme

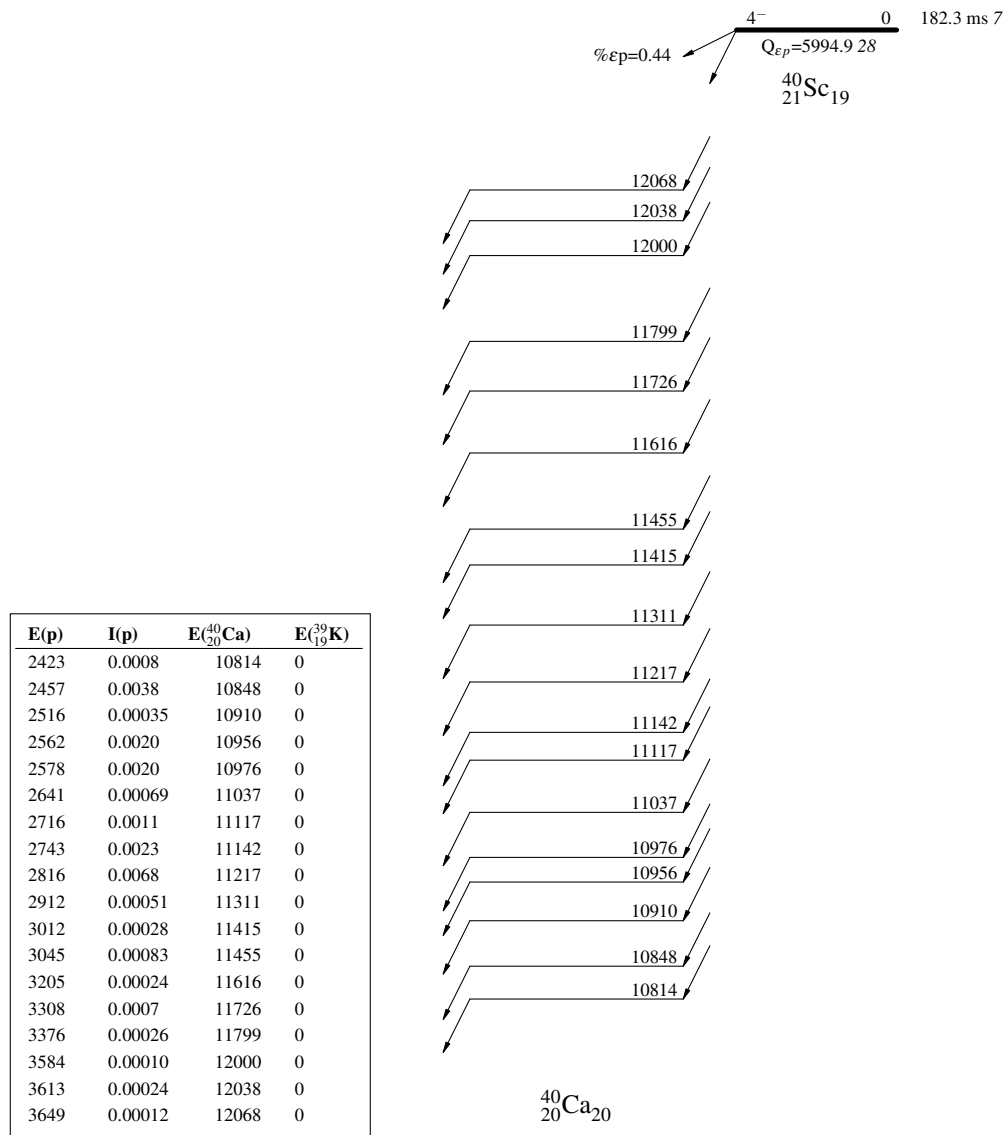
I(p) Intensities: I(p) per 100 parent decays



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Decay Scheme (continued)

I(p) Intensities: I(p) per 100 parent decays

 $3/2^+$ ${}^{39}_{19}\text{K}_{20}$