^{40}Ca(n,pγ),(n,p) 1972Di10,1967An07

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

1972Di10: (n,pγ) E=4.85-8.05 MeV. Natural target. Measured Eγ, Iγ, σ at 4.85, 5.40, 5.90, 6.45, 7.00, 7.50 and 8.05 MeV.
1967An07: (n,p) E=14.4 MeV. Measured proton spectrum, σ(θ), FWHM=600 keV.
Other (n,p) measurements:
Additional information 1.
1992Pa06: E=60-260 MeV. Measured σ(θ). Deduced distributions of Gamow-Teller (GT) (ΔL=0,ΔS=1,ΔJ=1) strength, Giant-dipole resonance (GDR,ΔS=0), and Giant-spin dipole resonance (GDSR,ΔS=1).
1989TrZT: Measured σ(θ). Deduced spin dipole resonance evidence.
1988Ma53: Analyzed single-nucleon transfer σ. Deduced gs occupation numbers, total B(GT).
1980Ba50: E=2.7-5.5 MeV. Measured σ.
1974Ba16: E=2.41-2.86 MeV. Measured σ.
1972Fo21, 1961Ur03: E=5.85 MeV. Measured σ(θ) for 0+30 doublet.
1969Wi12: E=14.6 MeV. Measured σ(θ).
1968Ka05: E=14.1 MeV. Measured σ(θ).
1967Me11: E=152 MeV. Measured proton spectrum.
1961Al34: E=15 MeV. Measured σ(E).
1956Da23: (n,pγ) E=2.557 MeV. Three γ rays reported at 30, 767 and 877 from first three excited states.
Data are from 1972Di10, unless otherwise noted.

Differential cross sections (in mb/sr) at different energies (125°)

Eγ	4.85 MeV	5.40 MeV	5.90 MeV	6.45 MeV	7.00 MeV	8.05 MeV
522			0.15 8	0.30 14	0.38 15	
646	0.40 12	0.57 12	0.4 1	0.63 10	0.89 22	0.70 9
770	12.7 14	10.1 12	8.9 13	14.2 15	15.4 16	17.0 17
891		0.70 11	0.95 14	1.51 20	1.31 19	1.04 15
1087		0.12 7	0.15 6	0.49 8	0.69 15	0.97 11
1159	3.5 4	3.4 4	3.4 5	4.7 6	5.7 6	6.2 7
1248	0.60 10	0.90 11	0.80 12	1.08 13	1.12 14	1.15 13
1270	0.26 10	0.20 7	0.20 4	0.37 12	0.27 10	0.49 8
1619	0.23 11	0.90 13	0.77 12	1.24 16	0.97 13	0.90 20
1929	0.34 10	0.33 9	0.25 5	0.65 9	0.48 13	1.04 21
1957				0.41 6	0.50 12	0.50 19
2008			0.45 10	1.18 13	1.27 14	0.88 18
2018	0.62 10	0.80 12	0.62 10	0.56 12	0.51 15	0.64 12
2040	0.74 12	1.10 13	0.93 14	1.28 24	1.23 24	
2072	1.20 15	1.84 21	1.8 3	2.48 27	2.26 26	2.65 40
2231		0.57 12	0.70 13	0.61 9		
2291	0.35 15	0.41 12	0.70 13			
2367		0.41 12	0.70 13	1.05 13	1.11 20	0.70 11
2547	0.46	0.46 13	0.64 12	1.35 15	1.46 19	1.43 20

^{40}K Levels

E(level)‡	Jπ†
0#	4⁻
30#	3⁻
800	2⁻
891	5⁻
1644	0⁺

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^{40}Ca(n,pγ),(n,p) 1972Di10,1967An07 (continued)

^{40}K Levels (continued)

E(level)‡	Jπ†	E(level)‡	Jπ†	E(level)‡	Jπ†	E(level)‡	Jπ†
1959	2^+	2261	3^+	2419	2^-	2757	2^+
2048	2^-	2290	1^+	2558?@		2808	$(1,2)^-$
2070	3^-	2291	3^-	2577	2^+		
2103	1^-	2397	4^-	2626	0^-		

† From Adopted Levels.
‡ 0+30 and 800+891 are unresolved in (n,p) (1967An07).
# Total cross section for 0+30=365 mb *27* at E=5.85 MeV (1972Fo21).
@ Level not reported in any other study of ^{40}K. It is considered as suspect by the evaluator.

γ(^{40}K)

E_i(level)	J_i^π	E_γ†	dσ/dΩ (mb/sr)‡	E_f	J_f^π
30	3^-	30[c] *2*		0	4^-
800	2^-	770	17.0 *17*	30	3^-
891	5^-	891	3.6 *4*	0	4^-
1959	2^+	1159	6.1# *6*	800	2^-
		1929	0.87 *9*	30	3^-
2048	2^-	1248	1.07 *13*	800	2^-
		2018	0.79 *12*	30	3^-
		2048	0.86 *12*	0	4^-
2070	3^-	1270	0.52 *12*	800	2^-
		2040	2.07 *23*	30	3^-
		2070[b]	≈1.45	0	4^-
2103	1^-	2073[b]	≈0.73	30	3^-
2261	3^+	2231	0.65 *22*	30	3^-
2290	1^+	646	0.75 *10*	1644	0^+
2291	3^-	2291	0.70@ *13*	0	4^-
2397	4^-	2367[a]	0.80 *16*	30	3^-
2419	2^-	1619	1.15 *20*	800	2^-
2558?		2558	0.21 *9*	0	4^-
2577	2^+	2547	1.56 *19*	30	3^-
2626	0^-	522	0.38& *15*	2103	1^-
2757	2^+	1957	0.40 *13*	800	2^-
2808	$(1,2)^-$	2008[a]	1.03 *12*	800	2^-
		2808[ad]	0.73 *14*	0	4^-

† 1972Di10 give ΔEγ=2 keV for unplaced γ rays but not for those placed. The evaluator have assumed ΔEγ=2 keV also for those γ-ray energies.
‡ From 1972Di10, at E=7.50 MeV, unless otherwise noted. 1972Di10 give cross section data at E=4.85, 5.45, 5.90, 6.45, 7.00 and 8.05 MeV also. See table of differential cross sections above.
# May contain some contribution from ^{44}Ca.
@ At E=5.90 MeV.
& At E=7.00 MeV.
[a] Wide peak at all neutron energies, may have another component.
[b] 2070 and 2073 are unresolved.
[c] From 1956Da23.

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^{40}Ca(n,pγ),(n,p) 1972Di10,1967An07 (continued)

$\gamma(^{40}K)$ (continued)

[d] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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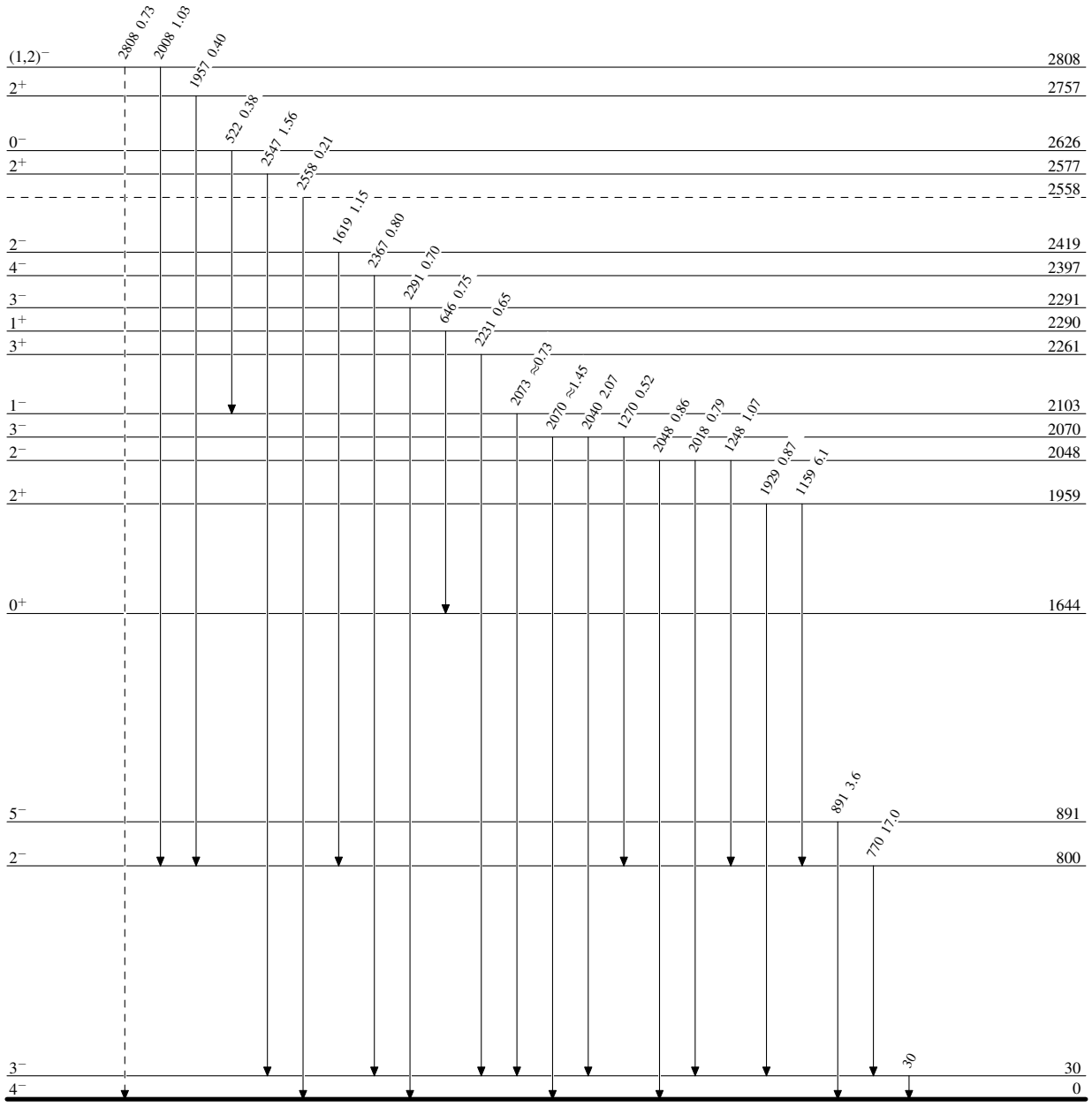
Legend

Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{19}K_{21}$