^{41}Ar β^- decay (109.61 min) 1971Ju04,1968Wh03,1956Sc91

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 133, 1 (2016)	30-Sep-2015

Parent: ^{41}Ar: E=0; $J^\pi=7/2^-$; $T_{1/2}$=109.61 min *4*; Q(β^-)=2492.0 *3*; %β^- decay=100.0

1971Ju04: ^{41}Ar activity from the ^{40}Ar(d,p) reaction with E(d)=3-4 MeV. Measured Eγ, Iγ using Ge(Li) detector.

1968Wh03: ^{41}Ar activity from irradiation of Ar gas in reactor. Precise measurement of Eγ of 1293.6γ using Ge(Li) detector.

1956Sc91: ^{41}Ar activity from irradiation of Ar gas in reactor. Measured Eγ, Iγ using NaI(Tl) scintillator and Eβ, Iβ using a 180° and lens-type magnetic β spectrometer.

$T_{1/2}$ and isotopic assignment: 2014Bh09, 1990Ab06, 1986Ru09, 1984Ke14, 1971Ju04, 1969Bo11, 1964Pa03, 1956Sc91, 1954An25, 1952Ka44, 1951Ha78, 1946Bl28, 1937Hu01, 1936Sn01.

β, shape factors: 2015Mo10, 1964Pa03, 1961Ka19, 1956Sc91, 1950Br29, 1946Bl28. 1972Ma72 (calculation of average Eβ).

γ: 2014Bh09, 1984Ke14, 1971Ju04, 1968Wh03 (also 1967Wh01), 1967Sm03, 1965Ma09, 1965Pr05, 1961Ka19, 1956Sc91, 1955Kl30.

ce: 1961Ka19.

$\gamma\gamma/\gamma$ measurement: 1962Al11.

$\beta\gamma$, $\beta\gamma$(t): 1953En06, 1952El27, 1946Bl28.

$\beta\gamma(\theta)$: 1960Bo02, 1966Dy02.

$\beta\gamma$(circ pol,θ): 1972Lo18, 1969Lo05, 1967Be20, 1962Ch17, 1962Bl02, 1960Bl08, 1960Ma02, 1960Bl01. 1972De59 (theory).

Fermi-matrix element and $\beta\gamma$(circ pol) data compiled and analyzed: 1965Da03.

Analysis of first-forbidden unique transitions: 1985To18, 1972Ma72,1971To08.

Source calibration techniques: 1996Yo12.

Fermi matrix element versus size parameter calculations: 1992Ya06.

α: Additional information 1.

^{41}K Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0	$3/2^+$		
1293.64 *4*	$7/2^-$	6.7 ns *5*	$T_{1/2}$: from $\beta\gamma$(t) (1952El27). Other: 6.6 ns (1953En06).
1677.0 *3*	$7/2^+$		

† From Eγ.

‡ From the Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(815.0 *4*)	1677.0	0.052 *5*	7.68 *5*	av Eβ=294.03 *18*
(1198.4 *3*)	1293.64	99.16 *2*	5.0477 *5*	av Eβ=459.36 *14* E(decay): others: 1198.3 *11* (1964Pa03), 1195 *8* (1961Ka19), 1199 *8* (1956Sc91), 1245 *5* (1950Br29). Allowed shape (1956Sc91,1961Ka19,1964Pa03).
(2492.0 *3*)	0	0.78 *2*	9.726[1u] *12*	av Eβ=1076.76 *15* Iβ^-: from 1961Ka19. Other: 0.88 (1956Sc91), 0.7 (1946Bl28). E(decay): others: 2489 *3* (1964Pa03), 2485 *10* (1961Ka19), 2480 *40* (1956Sc91), 2550 (1946Bl28). Unique first-forbidden shape (1956Sc91).

† From the yield of expected γ rays within 2 σ's, 1971Ju04 deduce following upper limits for some of the other levels: <0.025 for 980 level, <0.0038 for 1560 level, <0.0040 for 1582 level, <0.0058 for 1594 level, <0.0030 for 1698 level, <0.0054 for 2144 level

Continued on next page (footnotes at end of table)

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β^- radiations (continued)

and <0.012 for 2166 level.
‡ Absolute intensity per 100 decays.

$\gamma(^{41}K)$

Iγ normalization: from Iγ(1293γ+1677γ)=99.22 *2*, using %Iβ(to g.s.)=0.78 *2* (1961Ka19).
I($\gamma\gamma$)/Iγ<6×10^{-5} (1962Al11).

E_γ†	I_γ†#	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α	Comments
1293.64 *4*	100	1293.64	7/2$^-$	0	3/2$^+$	M2+E3	+0.118 *12*	6.8×10^{-5} *9*	α(K)=6.36×10^{-5} *9*; α(L)=5.34×10^{-6} *8*; α(M)=5.80×10^{-7} *9*; α(N)=2.14×10^{-8} *3* E_γ: from 1968Wh03. Others: 1293.76 *14* (1967Wh01), 1294.35 *30* (1967Sm03). α: from 1961Ka19.
1677.0 *3*	0.052 *5*	1677.0	7/2$^+$	0	3/2$^+$	E2		1.88×10^{-4}	α(K)=2.33×10^{-5} *4*; α(L)=1.95×10^{-6} *3*; α(M)=2.12×10^{-7} *3*; α(N)=7.81×10^{-9} *11* I_γ: other: 0.05 *2* (1965Pr05).

† From 1971Ju04, except where noted.
‡ From the Adopted Levels.
# For absolute intensity per 100 decays, multiply by 0.9916 *2*.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays