Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 179, 1 (2022)	30-Nov-2021

Q(β^-)=11940.4 *8*; S(n)=4643.8 *16*; S(p)=14206.2 *14*; Q(α)=−14230 *90* 2021Wa16
S(2n)=13013.2 *11*, S(2p)=3.313×10^4 *10*, Q(β^-n)=1988.9 *24* (2021Wa16).
Mass measurements: 2012La05 (M.E.=−32284.2 keV *8*, penning trap), 1980Ma40 (M.E.=−32150 keV *50*), 1978We14 (M.E.=−32117 keV *27*), 1974KlZM.
Other measurements:
2021Ko08: U(p,X) E=1 GeV at ISOLDE-CERN facility. Measured energy differences between atomic hyperfine transitions. Deduced isotope shift and charge radius.
2014Pa45,2014Kr04: E(p)=1.4 GeV at ISOLDE-CERN facility. Fragments separated and bunched by gas-filled Paul Trap (ISCOOL). Measured hyperfine spectra by collinear laser spectroscopy using COLLAPS at ISOLDE-CERN. Deduced spin, magnetic moment, rms charge radius.
2006Gu02: ^{48}Ca(t,^{3}He) E=129 MeV. Measured excitation, σ(E,θ). Deduced giant resonance features.
1999Ai02: Si(^{48}K,X) E≈38-80 MeV/nucleon. Measured σ. Deduced strong absorption radius.
1997Li15: Si(^{48}K,X) E=52-69 MeV/nucleon. Measured σ. Deduced absorption radius and neutron separation energy.

^{48}K Levels

Cross Reference (XREF) Flags

- A ^{48}Ca(^{7}Li,^{7}Be)
- B ^{48}Ca(^{14}C,^{14}N)
- C ^{198}Pt(^{48}Ca,Xγ)
- D ^{238}U(^{48}Ca,Xγ)

E(level)†	J$^\pi$‡	T$_{1/2}$#	XREF	Comments
0.0	1$^{(-)}$	6.8 s *2*	ABCD	%β^-=100; %β^-n=1.14 *15* (1982Ca04) μ=−0.8997 *45* (2014Pa45) J$^\pi$: spin=1 from hyperfine structure (2014Kr04); parity from strong β^- feeding to (2$^-$) levels (6895 and 7401) in ^{48}Ca. T$_{1/2}$: from 1975Mu08. Others: 6.9 s *2* (1981HuZT), 6 s *1* (1978De17), 1973RaYT, 1972RiZJ. %β^-n: from simultaneous β^- and n measurements (1982Ca04). μ: deduced from hyperfine parameters measured relative to those for ^{39}K whose parameters are known very precisely (2014Pa45). Statistical uncertainty of 0.0003 and an uncertainty of 0.0045 due to hyperfine anomaly are added in quadrature. Not listed in 2019StZV. Additional information 1. δ<r^2>(^{47}K,^{48}K)=+0.186 fm^2 *3*(stat) *16*(syst); $\delta\nu$(^{47}K,^{48}K)=+67.9 MHz *4*(stat) *3*(syst) (2014Kr04). $\delta\nu^{39,48}$=926.4 MHz *9*, δ<r^2>^{39,48}=0.328 fm^2 *8*(stat) *99* (syst) (2021Ko08). R$_{ch}$=3.4825 fm *12* (stat) *142* (syst) (2021Ko08). Configuration=$\pi 2s^{-1}_{1/2}\otimes\nu$(pf) (2014Pa45) from comparison with shell-model calculations.
142.70 *24*	(2$^-$)	21 ps *6*	D	
279	(2$^-$)	5.3 ps *10*	CD	
≈350?			B	
580?			A	
728	(3$^-$)	3.6 ps *7*	CD	
≈800?			B	
≈2100?			B	
2177	(5$^+$)	10 ns *3*	CD	T$_{1/2}$: unweighted average of 13 ns *2* in ^{198}Pt(^{48}Ca,Xγ) (2004IsZX) and 7.1 ns *5* in

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{48}K Levels (continued)

E(level)†	Jπ‡	XREF	Comments
			^{238}U(^{48}Ca,Xγ) (2011Kr12).
3403.5 *5*	(5$^-$)	D	
3586.2 *6*	(7$^+$)	D	

† From a least-squares fit to γ-ray energies for levels with deexciting gammas.
‡ As proposed by 2011Kr12 in ^{238}U(^{48}Ca,Xγ) based on comparisons of γ-decays with shell-model expectations, unless otherwise noted.
# From recoil-distance Doppler shift using plunger at PRISMA-CLARA facility (2011Kr12), unless otherwise noted.

γ(^{48}K)

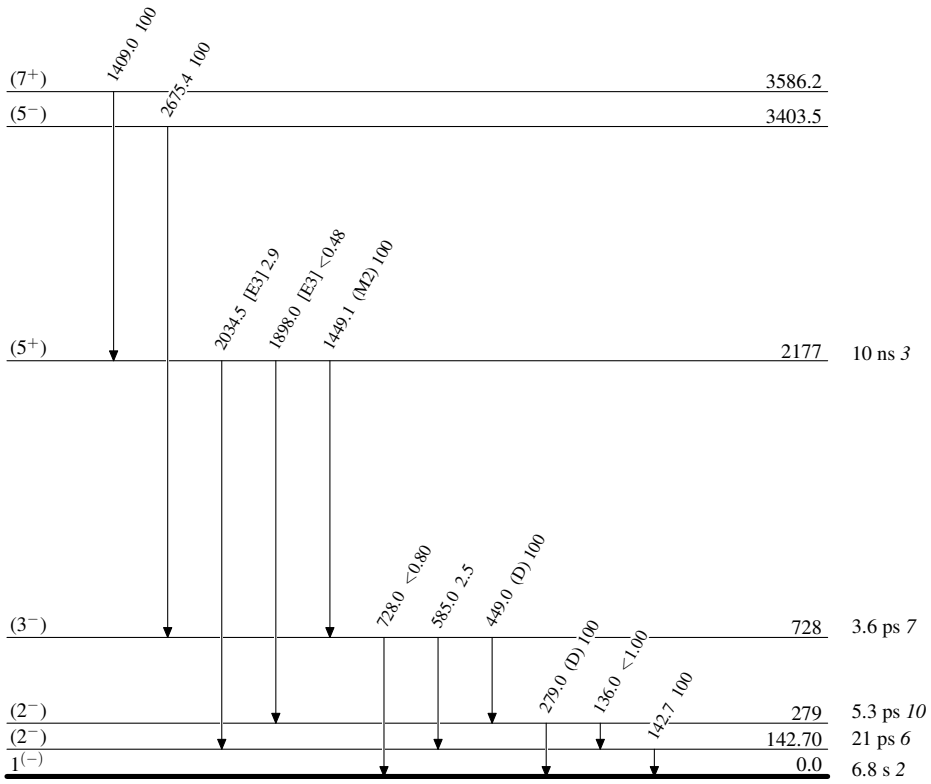
E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	Comments
142.70	(2$^-$)	142.7 *3*	100	0.0	1$^{(-)}$		
279	(2$^-$)	136.0	<1.00	142.70	(2$^-$)		
		279.0 *1*	100	0.0	1$^{(-)}$	(D)	
728	(3$^-$)	449.0 *1*	100	279	(2$^-$)	(D)	
		585.0 *10*	2.5 *8*	142.70	(2$^-$)		
		728.0	<0.80	0.0	1$^{(-)}$		
2177	(5$^+$)	1449.1 *1*	100 *4*	728	(3$^-$)	(M2)	B(M2)(W.u.)=0.036 *+16−9* Mult.: Q from W(in plane)/W(out of plane) in ^{198}Pt(^{48}Ca,Xγ) (2004IsZX); Δπ=(yes) from level scheme.
		1898.0	<0.48	279	(2$^-$)	[E3]	B(E3)(W.u.)<0.07
		2034.5 *4*	2.9 *7*	142.70	(2$^-$)	[E3]	B(E3)(W.u.)=0.17 *+9−6*
3403.5	(5$^-$)	2675.4 *4*	100	728	(3$^-$)		
3586.2	(7$^+$)	1409.0 *5*	100	2177	(5$^+$)		

† From 2011Kr12 in ^{238}U(^{48}Ca,Xγ).
‡ From γ(asymmetry): W(in plane)/W(out of plane) in ^{198}Pt(^{48}Ca,Xγ) (2004IsZX), with parentheses added by evaluator.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{48}_{19}K_{29}$