^{69}Kr $\varepsilon+\beta^+$ decay (27.9 ms) 2014De41,2011Ro47

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 207,1 (2026)	1-Apr-2023

Parent: ^{69}Kr: E=0.0; J^π=(5/2$^-$); $T_{1/2}$=27.9 ms *10*; Q(ε)=1412.0×10^1 *syst*; %ε+%β^+ decay=100

^{69}Kr-J^π,$T_{1/2}$: From ^{69}Kr Adopted Levels.

^{69}Kr-Q($\varepsilon+\beta^+$): 14120 *300* (syst,2021Wa16).

^{69}Kr-%ε+%β^+ decay: %εp=95.5 +35−62.

Dataset prepared by F. Kondev (ANL) and C.D. Nesaraja (ORNL).

2014De41: ^{69}Kr was produced in the fragmentation of a 70 MeV/u ^{78}Kr beam incident on a Be target at the NSCL, MSU facility. Reaction products were selected by the A1900 separator and implanted onto double-sided silicon strip detector (DSSD) at the NSCL Beta Counting System (BCS) for subsequent β and proton detections. BCS was surrounded by the 16 Segmented Germanium Array (SeGA) for detection of prompt and delayed gamma rays. Three PIN detectors were used to measure beam loss for particle identification. Measured E(p), Eγ, implant-p(t) coin, implant-p-γ(t) coin. Deduced: $T_{1/2}$, J^π, decay scheme.

2011Ro47: ^{69}Kr was produced in the fragmentation of a 70 MeV/u ^{78}Kr beam on a natural Ni target at GANIL. The reaction products were selected by the LISE3 separator and identified event-by-event using the time-of-flight and energy loss. They were implanted onto a double-sided silicon strip detector (DSSD) for subsequent β and proton detections correlated with β delayed protons were performed. An array of four high-purity germanium clovers surrounded the DSDD for γ-ray detection. Measured: E(p), Eγ, implant-p(t) coin, implant-p-γ(t) coin. Deduced: $T_{1/2}$, J^π, decay scheme. Other (same collaboration): 2014Ro14.

1997Xu01: ^{69}Kr was produced by the ^{40}Ca(^{32}S,3n) reaction using a E(^{32}S)=170 MeV beam incident on a natural calcium target. Measured: $T_{1/2}$ and delayed proton emission by the pulsed-beam technique using ΔE-E telescope and Si(Au) surface barrier detectors.

^{69}Br Levels

E(level)†	J^π†	$T_{1/2}$†	Comments
0.0	(5/2$^-$)	<24 ns	%p=100 Q(p)=641 keV *42* from 2014De41.
146 *55*	(3/2$^-$)		E(level): Symmetrized from 140 keV *+59−50*, based on Q(p)=781 keV *+41−28* to the ^{68}Se g.s., weighted average of Q(p)=751 keV *+132−82* (2014De41) and 785 keV *+34−40* (2011Ro18), and Q(p)[g.s to g.s]=641 keV *42* (2014De41). Note, that 2011Ro18 proposed that the 785 keV *+34−40* proton decay originated from the ^{69}Br ground state, but this was re-assigned in 2014De41.
3152 *47*	(5/2$^-$)		%p=100 T=3/2 E(level): Based on Q(p)=2939 keV *22* to the 854 keV, 2$^+$ level in ^{68}Se and Q(p)[g.s. to g.s.]=641 keV *42* (2014De41). Others: 3183 keV *65* and 3169 keV *45* using Q(p)=2970 keV *50* to the 854 keV, 2$^+$ level in ^{68}Se in 2011Ro47 and Q(p)=3810 keV *20* to the ^{68}Se g.s. in 2011Ro47, respectively, and Q(p)[g.s to g.s]=641 keV *42* (2014De41), and 3489 keV *50* using E(p)=4070 keV *50* to the ^{68}Se g.s. in 1997Xu01 and Q(p)[g.s to g.s]=641 keV *42* (2014De41). Note, that E(level)=3153 keV *55* is given in 2014De41. The main proton-decay branch is observed to populate the 854-keV, 2$^+$ level in ^{68}Se (2014De41,2011Ro47). I(p)<10% (2011Ro47) and <6.7% (2014De41) are proposed to the ^{68}Se ground state.

† From Adopted Levels.

^{69}Kr $\varepsilon+\beta^+$ decay (27.9 ms) 2014De41,2011Ro47 (continued)

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ †#	Iε†#	Log *ft*	I($\varepsilon+\beta^+$)†#	Comments
(10968 *syst*)	3152	52 *6*	0.070 *9*	3.53 *6*	52.5 *65*	av Eβ=4743 *28*; εK=0.001173 *20*; εL=0.0001339 *2*; εM+=2.68×10^{-5} *5* I($\varepsilon+\beta^+$): From 2014De41. Other: 50% *19* (2011Ro47).
(13974 *syst*)	146	0.5 *1*		6.10 *9*	0.5‡ *1*	av Eβ=6253 *38*
(14120 *syst*)	0.0	1.9 *4*	0.0011 *2*	5.54 *10*	1.9‡ *4*	av Eβ=6308 *15*; εK=0.000520 *4*; εL=5.93×10^{-5} *4*; εM+=1.186×10^{-5} *8*

† About 45% *7* of the total β^++ε-feeding intensity is unaccounted for.
‡ From a combined value of 2.4% *5* for the J^π=(5/2$^-$) and (3/2$^-$) levels in 2014De41 and P(β^++ε)(5/2$^-$)/P(β^++ε)(3/2$^-$)=4/1 (2014De41).
# Absolute intensity per 100 decays.