

⁸⁷Kr β⁻ decay 1971Sh01,1973BIZH,1973GeYV

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson and W. D. Kulp(a)		NDS 129, 1 (2015)	27-Jul-2015

Parent: ⁸⁷Kr: E=0.0; J^π=5/2⁺; T_{1/2}=76.3 min 5; Q(β⁻)=3888.27 25; %β⁻ decay=100.0

⁸⁷Rb Levels

The level scheme is that proposed by 1971Sh01, with one additional level at 1389 keV from 1973BIZH.

E(level) [†]	J ^π [‡]	T _{1/2}	E(level) [†]	J ^π [‡]
0.0	3/2 ⁻	4.97×10 ¹⁰ y 3	2378.38 18	
402.588 12	5/2 ⁻		2414.44 6	(3/2 ⁻)
845.44 4	(1/2) ⁻		2554.82 7	3/2 ⁺ ,5/2 ⁺
1349.36 10			2811.25 14	3/2 ⁺ ,5/2 ⁺
1389.88 12	(3/2) ⁻		2960.62 7	(3/2,5/2) ⁺
1578.05 6	1/2 ⁻ ,3/2 ⁻		3055.15 24	3/2,5/2,7/2 ⁽⁻⁾
1740.58 5	(3/2,5/2) ⁻		3308.49 12	3/2 ⁺ ,5/2 ⁺

[†] From least-squares fit to γ-ray energies.

[‡] From ⁸⁷Rb Adopted Levels.

β⁻ radiations

E(decay) [†]	E(level)	Iβ ⁻ ^{‡#@&}	Log ft	Comments
(579.8 3)	3308.49	0.49 4	6.33 4	av Eβ=187.49 11 Iβ ⁻ : other: 0.91 (1973Wo01); this value may include some scattered electrons or it may indicate additional γ rays from this level.
(833.1 4)	3055.15	0.108 9	7.55 4	av Eβ=287.26 15
(927.6 3)	2960.62	4.4 4	6.11 4	av Eβ=326.12 11
(1077.0 3)	2811.25	0.60 4	7.22 3	av Eβ=388.95 13
(1333.4 3)	2554.82	9.4 7	6.38 4	Iβ ⁻ : other: 0.42 (1973Wo01). av Eβ=500.05 12
(1473.8 3)	2414.44	5.5 3	6.788 24	Iβ ⁻ : other: 8.09 (1973Wo01). av Eβ=562.23 12
(1509.9 3)	2378.38	0.060 12	8.79 9	Iβ ⁻ : other: 5.07 (1973Wo01). av Eβ=578.33 14
(2147.7 3)	1740.58	0.62 9	8.40 7	av Eβ=869.60 12
(2310.2 3)	1578.05	0.12 5	9.24 18	av Eβ=945.25 12
(2498.4 3)	1389.88	0.119 8	9.39 3	av Eβ=1033.36 13
(3042.8 3)	845.44	7.3 4	9.371 ^{1u} 24	av Eβ=1293.80
(3485.7 3)	402.588	41 3	7.47 4	av Eβ=1501.66 Iβ ⁻ : other: 42.9 (1973Wo01).
(3888.27 25)	0.0	30.5 22	7.81 4	av Eβ=1694.44

[†] β⁻ energies were measured with σ=50 keV to 100 keV by 1969Bo02. For other measurements, see 1969On01 and 1969Ly01.

[‡] A measurement in a magnetic spectrometer and detailed analysis of the β⁻ spectrum was carried out by 1973Wo01. The decomposition of this spectrum was done without intensity constraints from the decay scheme and with constraints based on several previous decay schemes. Their results which differ significantly from those from the intensity balances are noted.

[#] The value for the decay to the ground state, 30.5, is from 1973Wo01 and those for the excited levels are from the γ-ray intensity balances. Where they differ significantly, the values recommended by 1973Wo01 are given in comments. The analysis of 1973Wo01 does not include the level at 1389 and it does not give values for branches of less than 0.4%.

Continued on next page (footnotes at end of table)

^{87}Kr β^- decay [1971Sh01](#),[1973BIZH](#),[1973GeYV](#) (continued)

β^- radiations (continued)

@ The β strength function has been reported by [1973Jo02](#) in graphical form. These data support the absence of any strong β branches to levels between 900 and 1500 keV.

& Absolute intensity per 100 decays.

⁸⁷Kr β⁻ decay [1971Sh01](#),[1973BlZH](#),[1973GeYV](#) (continued)

γ(⁸⁷Rb)

I_γ normalization: calculated to give 100% feeding of ground state with direct β⁻ feeding of 30.5% *22* ([1973Wo01](#)).

γ-ray data for about 30 γ's were measured with good accuracy by [1971Sh01](#), [1973BlZH](#), and [1973GeYV](#). They are in good agreement even for very weak transitions. γγ-coincidences (Ge(Li)) were measured by [1971Sh01](#). Shorter sets of γ data are given by [1967Ho17](#), [1969Bo02](#), [1969Ly01](#), [1969On01](#), and 1 γ ray by [1979Bo26](#).

E _γ [‡]	I _γ ^{‡a}	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	δ	α [†]	Comments
^x 129.4 ^{&} <i>3</i> 402.588 <i>12</i>	0.09 <i>2</i> 100 <i>4</i>	402.588	5/2 ⁻	0.0	3/2 ⁻	M1+E2	-0.24 <i>12</i>	0.00411 <i>18</i>	E _γ : From 1979Bo26 . Others: 402.7 <i>3</i> , (1971Sh01), 402.60 <i>10</i> , and 402.578 <i>20</i> , (1973GeYV). δ: from ⁸⁷ Rb Adopted Gammas.
^x 510.78 [#] <i>14</i> 582.32 [#] <i>21</i> 673.83 <i>8</i> 814.25 <i>6</i> 836.38 <i>5</i> 845.44 <i>4</i> 894.02 <i>13</i>	0.16 <i>4</i> 0.07 <i>2</i> 3.81 <i>10</i> 0.33 <i>2</i> 1.56 <i>4</i> 14.8 <i>4</i> 0.092 <i>7</i>	2960.62 2414.44 2554.82 2414.44 845.44 3308.49	(3/2,5/2) ⁺ (3/2 ⁻) 3/2 ⁺ ,5/2 ⁺ (3/2 ⁻) (1/2) ⁻ 3/2 ⁺ ,5/2 ⁺	2378.38 1740.58 1740.58 1578.05 0.0 2414.44	3/2 ⁻ (3/2,5/2) ⁻ (3/2,5/2) ⁻ 1/2 ⁻ ,3/2 ⁻ 3/2 ⁻ (3/2 ⁻)				E _γ : uncertainty in energy of this weak γ seems to be underestimated by 1973BlZH and was increased by the evaluator from 0.1 to 0.2 keV.
^x 901.5 ^{&} <i>3</i> 946.69 <i>13</i> 976.14 <i>12</i> ^x 1063.2 [#] <i>4</i> 1175.41 <i>7</i> 1338.00 <i>7</i> 1382.55 <i>7</i> 1389.87 <i>12</i> 1461.3 ^{&} <i>7</i> 1531.2 ^{&b} <i>4</i>	0.053 <i>9</i> 0.26 <i>1</i> 0.113 <i>8</i> 0.054 <i>12</i> 2.23 <i>8</i> 1.28 <i>7</i> 0.58 <i>2</i> 0.24 <i>1</i> 0.10 <i>1</i> 0.72 <i>11</i>	1349.36 2554.82 1578.05 1740.58 2960.62 1389.88 2811.25 2378.38	3/2 ⁺ ,5/2 ⁺ 1/2 ⁻ ,3/2 ⁻ (3/2,5/2) ⁻ (3/2,5/2) ⁺ (3/2) ⁻ 3/2 ⁺ ,5/2 ⁺	402.588 1578.05 402.588 402.588 1578.05 0.0 1349.36 845.44	5/2 ⁻ 1/2 ⁻ ,3/2 ⁻ 5/2 ⁻ 5/2 ⁻ 1/2 ⁻ ,3/2 ⁻ 3/2 ⁻ (1/2) ⁻				E _γ : from 1971Sh01 , but is a poor fit and not resolved by 1973GeYV from the double-escape peak of the 2554γ. Not included in the least-squares fit which gives E _γ =1532.96 <i>12</i> for this transition.
1578.03 <i>14</i> 1611.18 <i>14</i> 1740.51 <i>7</i> ^x 1842.61 [@] <i>23</i> 2011.88 <i>10</i> 2378.5 <i>3</i>	0.26 <i>2</i> 0.23 <i>3</i> 4.11 <i>9</i> 0.28 <i>2</i> 5.81 <i>23</i> 0.19 <i>1</i>	1578.05 2960.62 1740.58 2414.44 2378.38	1/2 ⁻ ,3/2 ⁻ (3/2,5/2) ⁺ (3/2,5/2) ⁻ (3/2 ⁻)	0.0 1349.36 0.0 402.588 0.0	3/2 ⁻ 3/2 ⁻ 5/2 ⁻ 5/2 ⁻ 3/2 ⁻				

3

⁸⁷Kr β⁻ decay [1971Sh01](#),[1973BIZH](#),[1973GeYV](#) (continued)

γ(⁸⁷Rb) (continued)

<u>E_γ[‡]</u>	<u>I_γ^{‡a}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>E_γ[‡]</u>	<u>I_γ^{‡a}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>
2408.46 15	0.46 4	2811.25	3/2 ⁺ ,5/2 ⁺	402.588	5/2 ⁻	2961.2 [#] 8	0.14 4	2960.62	(3/2,5/2) ⁺	0.0	3/2 ⁻
2554.75 25	18.6 9	2554.82	3/2 ⁺ ,5/2 ⁺	0.0	3/2 ⁻	3055.1 3	0.162 13	3055.15	3/2,5/2,7/2 ⁽⁻⁾	0.0	3/2 ⁻
2558.08 19	8.0 5	2960.62	(3/2,5/2) ⁺	402.588	5/2 ⁻	3308.5 2	0.90 5	3308.49	3/2 ⁺ ,5/2 ⁺	0.0	3/2 ⁻
2652.48 38	0.047 8	3055.15	3/2,5/2,7/2 ⁽⁻⁾	402.588	5/2 ⁻	^x 3704.6 ^{@&} 10	0.03 1				
2811.36 20	0.65 3	2811.25	3/2 ⁺ ,5/2 ⁺	0.0	3/2 ⁻						

[†] Additional information 1.

[‡] Weighted average of values from [1971Sh01](#), [1973BIZH](#), and [1973GeYV](#), unless noted otherwise.

[#] Not observed by [1973GeYV](#).

[@] Not observed by [1971Sh01](#).

[&] Not observed by [1973BIZH](#).

^a For absolute intensity per 100 decays, multiply by 0.496 24.

^b Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

$^{87}\text{Kr} \beta^-$ decay 1971Sh01,1973BIZH,1973GeYV

Decay Scheme

Legend

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

- $I_{\gamma} < 2\% \times I_{\gamma}^{max}$
- $I_{\gamma} < 10\% \times I_{\gamma}^{max}$
- $I_{\gamma} > 10\% \times I_{\gamma}^{max}$
- - - - γ Decay (Uncertain)
- Coincidence

