^{202}Po ε+β$^+$ decay 1986Va31

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 196,342 (2024)	1-Sep-2023

Parent: ^{202}Po: E=0.0; J$^\pi$=0$^+$; $T_{1/2}$=44.5 min *4*; Q(ε)=2809 *16*; %ε+%β$^+$ decay=98.08 *7*

1986Va31: ^{202}Po production: spallation reactions; target: metallic thorium; beam: E(p)=660 MeV; ^{202}Po mass separated from other Po isotopes; detectors: Ge(Li), Si(Li), β magnetic spectrometer in conjunction with Ge(Li) for γ-ce coincidences.

Others (same authors): 1971KuZK, 1977VaYV, 1983KuZR, 1984KuZV.

Others: 1970DaZM, 1970Jo26,

^{202}Bi Levels

E(level)†	J$^\pi$†	$T_{1/2}$†
0.0	5$^+$	1.71 h *4*
41.30 *9*	(4$^+$)	

† From Adopted Levels.

γ(^{202}Bi)

Iγ normalization: Weighted average of 0.47 *6* (1970Jo26) and 0.46 *5* (1986Va31); Other: 0.59 *7* (1971KuZK).

Kα$_2$ x ray=77 *5*, Kα$_1$ x ray=130 *5*, Kβ$_1$ x ray=44.5 *25*, Kβ$_2$ x ray=15.4 *7* (1986Va31).

Eγ†	Iγ†b	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.	α^c	Comments
^{x}32.0‡ *5*	≈2.5‡							
^{x}34.6‡ *5*	0.156‡ *25*							
^{x}39.4 *4*	0.110 *15*							α(L1)exp=20 *8*.
41.30 *9*	5.98 *25*	41.30	(4$^+$)	0.0	5$^+$	M1	25.4	α(L)=19.4 *3*; α(M)=4.56 *7*; α(N+..)=1.435 *23* α(N)=1.168 *18*; α(O)=0.239 *4*; α(P)=0.0284 *5* Mult.: L$_1$/L$_2$/L$_3$/M/N=100/9.7 *14*/1.05 *23*/26 *3*/8.4 *12*. Eγ: Placement from Eα differences in ^{206}At α decay (1981Va29).
^{x}47.80 *6*	0.24 *3*							α(L1)exp=10 *2*; α(L2)exp≤1.7; α(L3)exp≤0.8; α(M)exp=3.4 *7*.
^{x}49.75 *12*	0.244 *10*							α(L2)exp≤2.5; α(M)exp=4.1 *16*.
^{x}65.17 *5*	3.85 *16*							α(L2)exp=19 *2*; α(L3)exp=16.6 *17*; α(M)exp=2.5 *6*.
^{x}67.25 *4*	0.43 *3*							α(M)exp≤2.33.
^{x}70.70 *9*	1.76 *10*							α(L1)exp=3.8 *5*; α(L2)exp≤0.51; α(L3)exp≤0.34; α(M)exp=0.51 *16*.
^{x}93.5 *3*	0.10 *3*							
^{x}104.67 *4*	0.39 *4*							α(K)exp=6.2 *19*; α(L3)exp≤0.26.
^{x}116.62 *4*	0.47 *2*							α(L3)exp≤0.32; α(M)exp≤0.32.
^{x}120.96 *5*	0.68 *3*							α(K)exp=4.9 *8*; α(L1+L2)exp=0.94 *15*.
^{x}124.04 *3*	1.44 *6*							α(K)exp=4.2 *5*; α(L3)exp≤0.139.
^{x}130.8‡ *5*	0.12‡ *4*							
^{x}137.18 *9*	0.65 *7*							α(K)exp=4.2 *8*.
^{x}144.20 *25*	0.13 *3*							
^{x}146.00 *4*	0.568 *24*							α(K)exp=2.5 *3*.
^{x}152.76 *3*	1.43 *12*							α(L3)exp≤0.049.
^{x}165.77 *3*	17.0 *7*							α(K)exp=2.6 *3*; α(L1+L2)exp=0.50 *13*.
^{x}185.36 *8*	0.94 *8*							α(K)exp=1.31 *22*; α(L1+L2)exp=0.29 *8*.
^{x}190.27 *4*	0.63 *4*							α(K)exp=1.26 *21*.
^{x}213.732 *17*	6.5 *3*							α(K)exp=1.20 *21*; α(L1+L2)exp=0.22 *6*.

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^{202}Po $\varepsilon+\beta^+$ decay 1986Va31 (continued)

$\gamma(^{202}Bi)$ (continued)

E_γ [†]	I_γ [†b]	E_i(level)	Comments
[x]215.908 *15*	3.10 *13*		α(K)exp=1.0 *2*.
[x]221.6 *5*	0.33 *3*		
[x]251.75[#] *3*	2.93 *16*		
[x]268.16[a] *7*	1.84 *20*		α(K)exp=0.60 *9*; α(L)exp=0.098 *24*.
[x]280.05 *6*	1.59 *9*		α(K)exp=0.48 *6*; α(L)exp=0.08 *2*.
[x]290.11 *21*	0.74 *9*		α(K)exp=0.43 *16*.
[x]292.50 *7*	1.33 *11*		α(K)exp=0.47 *8*.
[x]307.3 *5*	0.65 *8*		
[x]316.14[&] *4*	28.0 *15*		α(K)exp=0.34 *5*; α(L)exp=0.052 *9*; α(M)exp=0.014 *3*; α(N)exp≈0.0046.
[x]325.4[‡] *5*	0.60[‡] *20*		
[x]336.87 *4*	3.80 *16*		α(K)exp=0.27 *3*; α(L)exp≈0.053.
[x]428.09 *25*	2.96 *12*		α(K)exp=0.09 *2*.
[x]445.2[‡] *8*	0.50[‡] *15*		
[x]451.6[‡] *10*	0.50[‡] *15*		
[x]458.502[a] *25*	7.2 *3*		α(K)exp=0.111 *15*; α(L)exp=0.021 *6*; α(M)exp=0.005 *1*.
[x]483.23 *5*	1.80 *15*		α(K)exp=0.122 *16*; α(L)exp=0.020 *3*.
[x]506.46[&] *3*	8.0 *3*		α(K)exp=0.096 *14*.
[x]539.8[‡] *8*	0.50[‡] *10*		
[x]551.52 *3*	3.14 *20*		α(K)exp=0.070 *8*.
[x]561.51 *8*	1.00 *4*		α(K)exp=0.034 *7*.
[x]598.12 *5*	4.3 *3*		α(K)exp=0.0063 *12*.
[x]609.5 *5*	0.80 *10*		α(K)exp=0.053 *12*.
[x]625.29[#] *4*	3.10 *23*		α(K)exp=0.054 *7*; α(L)exp≈0.0065.
[x]631.6[‡] *8*	0.61[‡] *10*		
[x]643.86 *4*	6.9 *3*		α(K)exp=0.052 *6*; α(M)exp≈0.0029.
[x]662.6 *3*	1.80 *23*		
[x]672.2 *5*	1.15 *14*		
[x]679.6 *6*	1.40 *17*		α(K)exp≈0.043.
[x]684.6 *3*	2.40 *22*		α(K)exp≈0.050.
[x]688.803[#@] *25*	100 *4*		α(K)exp=0.105 *9*; α(L)exp=0.022 *2*; α(M)exp=0.0050 *8*; α(N)exp=0.0014 *3*.
[x]712.15[#] *3*	9.0 *4*		α(K)exp=0.0053 *9*.
[x]717.19[@] *6*	11.6 *5*		α(K)exp=0.0037 *7*.
[x]727.1[‡] *6*	0.50[‡] *11*		
[x]731.6 *4*	0.90 *11*		
[x]749.38 *7*	1.30 *26*		α(K)exp≤0.023 *5*.
[x]785.64[#] *6*	2.80 *20*		α(K)exp≤0.0071 *5*.
[x]790.48[@] *5*	13.5 *6*		α(K)exp=0.033 *3*.
[x]803.84 *17*	0.81 *18*		
[x]809.04[a] *6*	2.80 *17*		α(K)exp=0.029 *5*; α(L)exp=0.0054 *11*.
[x]815.5[‡] *10*	0.55[‡] *15*		
[x]828.40 *4*	3.40 *23*		α(K)exp≤0.0088.
[x]858.0 *6*	1.07 *11*		
[x]872.5[‡] *6*	0.55[‡] *12*		
[x]876.66[#] *5*	3.12 *15*		α(K)exp≤0.0080.
[x]891.5[‡] *10*	0.35[‡] *7*		
[x]935.83 *7*	2.00 *16*		α(K)exp=0.020 *4*.
[x]949.5[‡] *10*	0.85[‡] *15*		
[x]954.8[‡] *5*	1.0[‡] *3*		
[x]967.5[‡] *10*	0.50[‡] *15*		

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^{202}Po ε+β^+ decay 1986Va31 (continued)

γ(^{202}Bi) (continued)

E_γ[†]	I_γ[†b]	E_i(level)	Comments
[x]973.84 *5*	9.4 *4*		α(K)exp=0.0120 *13*.
[x]994.36 *12*	1.78 *10*		α(K)exp=0.0056 *12*.
[x]999.65 *4*	2.13 *12*		α(K)exp=0.012 *3*.
[x]1046.0[‡] *10*	0.30[‡] *10*		
[x]1060.59 *4*	2.55 *15*		α(K)exp=0.0125 *21*; α(L)exp=0.0024 *5*.
[x]1078.19[&] *6*	2.20 *15*		α(K)exp=0.018 *5*.
[x]1104.2 *3*	0.55 *16*		α(K)exp=0.013 *5*.
[x]1121.04[a] *5*	2.28 *17*		α(K)exp=0.0132 *24*.
[x]1169.03[&] *6*	3.80 *16*		α(K)exp=0.0124 *19*.
[x]1173.8 *5*	0.27 *7*		α(K)exp≈0.011.
[x]1183.8 *3*	0.41 *5*		α(K)exp≈0.012.
[x]1215.46 *8*	3.25 *20*		α(K)exp=0.0108 *14*.
[x]1241.0[‡] *10*	0.30[‡] *7*		
[x]1250.0[‡] *10*	0.25[‡] *15*		
[x]1263.6[‡] *7*	0.40[‡] *10*		
[x]1288.90 *14*	1.25 *7*		α(K)exp=0.0094 *14*.
[x]1301.5[‡] *10*	0.23[‡] *5*		
[x]1305.5[‡] *10*	0.22[‡] *5*		
[x]1318.5[‡] *10*	0.25[‡] *10*		
[x]1327.0[‡] *5*	0.26[‡] *4*		
[x]1335.0 *5*	0.45 *8*		
[x]1371.0[‡] *10*	0.18[‡] *5*		
[x]1382.5 *10*	0.40 *10*		α(K)exp≈0.0075.
[x]1385.5 *10*	0.40 *10*		α(K)exp≤0.0038.
[x]1391.7 *4*	0.55 *7*		α(K)exp=0.0062 *18*.
[x]1401.0[‡] *10*	0.20[‡] *8*		
[x]1416.0[‡] *10*	0.20[‡] *6*		
[x]1475.6[‡] *7*	0.30[‡] *8*		
[x]1499.8[‡] *7*	0.19[‡] *4*		
[x]1508.0[‡] *10*	0.25[‡] *5*		
[x]1520.5 *10*	0.36 *4*		α(K)exp=0.0069 *18*.
[x]1543.7 *3*	0.60 *5*		α(K)exp≈0.0067.
[x]1548.8 *5*	0.46 *7*		α(K)exp≈0.0065.
[x]1650.2 *8*	0.32 *7*		α(K)exp=0.0072 *24*.

† From 1986Va31, unless otherwise stated.
‡ Tentatively assigned to ^{202}Po ε decay in 1986Va31.
\# In coincidence with the 41.30-keV L_1 line in 1986Va31.
@ In coincidence with the 65.17-keV L_2 line in 1986Va31.
& In coincidence with the 165.77-keV K line in 1986Va31.
a In coincidence with the 213.732-keV K line in 1986Va31.
b For absolute intensity per 100 decays, multiply by 0.45 *4*.
c Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
x γ ray not placed in level scheme.

^{202}Po ε decay 1986Va31

Decay Scheme

Intensities: I_γ per 100 parent decays