^{24}Na β^- decay (14.956 h)

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty	NDS 186, 2 (2022)	31-Mar-2022

Parent: ^{24}Na: E=0; $J^\pi=4^+$; $T_{1/2}$=14.956 h *3*; Q(β^-)=5515.677 *21*; %β^- decay=100.0
^{24}Na-J^π,$T_{1/2}$: From ^{24}Na Adopted Levels.
^{24}Na-Q(β^-): From 2021Wa16.
Source production by ^{23}Na(n,γ).
1951Tu12: Organic crystal scintillator. Measured secondary electron spectrum from ^{24}Na.
1952Bl53: β-ray spectrometer (Agnew and Anderson). Measured the positron spectra from the internal pair conversion of γ.
1960Ar10: Measured γ-spectrum in the 2500-5500 keV energy range.
1961Gl17: NaI(Tl). Measured 2754γ-1368γ (θ).
1962Mo09: NaI(Tl). Measured Eγ, Iγ.
1963Ha22: γ-ray polarimeter, integral β spectrometer, measured circular polarization.
1968Va06: NaI(Tl). Measured Eγ, Iγ.
1970Le12: NaI(Tl). Measured Eγ, Iγ.
1972Ra21: Ge(Li) detector, measured Eγ, Iγ, deduced log *ft*.
1985LoZT: Compilation and recommendation Eγ, Iγ.
1995HeZZ: Compilation and recommendation Eγ, Iγ.
2003Ep02: HPGe. Measured Eγ, Iγ.

^{24}Mg Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0	0^+	stable	
1368.667 *5*	2^+		Iβ=0.003 (1951Tu12) yields a log *ft* value of 12.7.
4122.844 *12*	4^+		
4238.38 *13*	2^+		
5235.21 *8*	3^+		

[†] From Eγ.
[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(280.47 *8*)	5235.21	≈0.070	≈6.66	av Eβ=89.985 *30* Iβ^-: Approximate value by the evaluators. Others: 0.070 *6* from Iγ intensity balance, yields total Iβ slightly lower compared to ΣIβ=100; 0.070 *3* (1972Ra21).
(1392.833 *24*)	4122.844	99.867 *10*	6.12 *1*	av Eβ=555.10

[†] From γ-ray intensity balance at each levels.
[‡] Absolute intensity per 100 decays.

^{24}Na β^- decay (14.956 h) (continued)

$\gamma(^{24}Mg)$

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[@]	$I_{(\gamma+ce)}$[#]	Comments
996.83 *10*	0.0021 *2*	5235.21	3^+	4238.38	2^+					E_γ: From Adopted Gammas. I_γ: From adopted branching ratios.
1368.625 *5*	99.994 *2*	1368.667	2^+	0	0^+	E2		1.3×10^{-5}	3	E_γ: From 1995HeZZ. I_γ: From 1985LoZT, in their Ref. [4], p. 404. Mult.: From $\gamma\gamma(\theta)$, internal pair conversion coefficient 6×10^{-5} *1* (1952Bl53).
2754.008 *11*	99.867 *10*	4122.844	4^+	1368.667	2^+	E2				E_γ: From 1995HeZZ. I_γ: unweighted average of Pγ(2754.0)=0.99876 *8* [from 1985LoZT, in their Ref. [4], p. 404] and 0.99857 *5* [using the data in Ref. [3], p. 105 of 1985LoZT: Pγ(1368.7): Pγ(2754.0)=1: 0.998635 *5* and adopted Pγ(1368.7)=0.99994 *2*). Mult.: From $\gamma\gamma(\theta)$, internal pair conversion coefficient 7.1×10^{-4} *2* (1952Bl53).
2871.0[†] *10*	0.00025[†] *4*	4238.38	2^+	1368.667	2^+	M1+E2[‡]	−23[‡] *9*			
3866.15 *10*	0.068 *6*	5235.21	3^+	1368.667	2^+	E2(+M1)[‡]	−17[‡] *4*			E_γ: From Adopted Gammas. I_γ: unweighted average of 0.061 *5* (1972Ra21), 0.0489 *25* (1970Le12) 0.075 *20* (1962Mo09), 0.063 *6* (1968Va06), 0.067 *2* (2003Ep02), and 0.09 *2* (1960Ar10).
4238.9[†] *10*	0.00084[†] *10*	4238.38	2^+	0	0^+	[E2]				I_γ: Other values: <0.0033 (1970Le12), 0.008 *3* (1962Mo09), 0.00085 *39* (2003Ep02) and 0.0015 *5* (1960Ar10).

[†] From 1972Ra21.
[‡] From Adopted Gammas.
[#] Absolute intensity per 100 decays.
[@] 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.

$^{24}_{12}Mg_{12}$-2

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Decay Scheme

Intensities: I_γ per 100 parent decays