^{64}Mn β^- decay (90 ms) 1999Ha05,2000HaZL

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

Parent: ^{64}Mn: E=0; $J^\pi=1^{(+)}$; $T_{1/2}$=90 ms *4*; Q(β^-)=11981 *6*; %β^- decay=100.0
^{64}Mn-J^π,$T_{1/2}$: From ^{64}Mn Adopted Levels.
^{64}Mn-Q(β^-): From 2021Wa16.
1999Ha05, 2000HaZL: Measured Eγ, Iγ, $\gamma\gamma$, isotopic $T_{1/2}$.
Level scheme from 2000HaZL, only the first 2^+ level is discussed in 1999Ha05.
1999So20: 746γ reported from ^{64}Mn decay.
2002MaZN: 696 *1* and 747 *1* γ rays reported by 2002MaZN.
2005GaZR: measured half-life of ^{64}Mn decay.

^{64}Fe Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	0^+	2.0 s *3*	
746.6 *6*	2^+	6.8 ps *7*	
1443.7 *8*	$(1,2^+)$		
1763	4^+		E(level): this level may be populated in this decay as stated by 2006Ho20 that a 1017γ has been tentatively identified (by 2006Ho20) in a γ-ray spectrum from ^{64}Mn decay measured at ISOLDE (reference 17 in 2006Ho20: priv comm from K.L. Kratz and ISOLDE collaboration (2005)). The evaluator also obtained a copy of this spectrum and the peak at 1017 keV is clearly visible with an intensity of about 25% of 1105γ. This level is confirmed in the study of ^{65}Mn β^-n decay by 2013Ol06.
1853.2 *6*	$(1,2^+)$		
2116.7 *7*	$(1,2^+)$		
3093.4 *9*	(0,1,2)		J^π: 2000HaZL suggest 0^+.
3306.8 *6*	$(1,2^+)$		
3317.0 *9*	(0,1,2)		J^π: 2000HaZL suggest 4^+.
4226.9 *6*	$(1,2^+)$		

† From a least-squares fit to Eγ values, assuming ΔEγ=1 keV.
‡ From the Adopted Levels.

β^- radiations

Iβ^- from 2000HaZL are given only under comments, as the decay scheme is incomplete and meaningful Iβ values cannot be deduced.

E(decay)	E(level)	Comments
(7754 *6*)	4226.9	av Eβ=3.68×10^3 *19* Iβ^-: 0.8 (2000HaZL).
(8664 *6*)	3317.0	av Eβ=4.13×10^3 *19* Iβ^-: 3.6 (2000HaZL).
(8674 *6*)	3306.8	av Eβ=4.13×10^3 *19* Iβ^-: 2.5 (2000HaZL). Note that Iγ(3306γ) is unknown.
(8888 *6*)	3093.4	av Eβ=4.24×10^3 *19* Iβ^-: 1.9 (2000HaZL).
(9864 *6*)	2116.7	av Eβ=4.71×10^3 *19* Iβ^-: 3.3 (2000HaZL).
(10128† *6*)	1853.2	Iβ^-: 3.8 (2000HaZL).

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^{64}Mn β^- decay (90 ms) 1999Ha05,2000HaZL (continued)

β^- radiations (continued)

E(decay)	E(level)	Comments
(10537 *6*)	1443.7	av Eβ=5.04×10^3 *19* Iβ$^-$: 4.3 (2000HaZL).
(11234 *6*)	746.6	av Eβ=5.38×10^3 *19* Iβ$^-$: 26.7 (2000HaZL).
(11981 *6*)	0.0	av Eβ=5.75×10^3 *19* Iβ$^-$: 20 (2000HaZL).

† Existence of this branch is questionable.

γ(^{64}Fe)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	Comments
x376‡							
x588.2‡							
697	16	1443.7	(1,2$^+$)	746.6	2$^+$		
x704.5‡							
746.7#	100	746.6	2$^+$	0.0	0$^+$	E2	
x877‡							
910	0.19	4226.9	(1,2$^+$)	3317.0	(0,1,2)		
920	0.58	4226.9	(1,2$^+$)	3306.8	(1,2$^+$)		
1017@	≈1.2@	1763	4$^+$	746.6	2$^+$	E2	This γ from the 1763 level is confirmed in the study of ^{65}Mn β$^-$n decay by 2013Ol06.
1105	5.2	1853.2	(1,2$^+$)	746.6	2$^+$		
1240	3.37	3093.4	(0,1,2)	1853.2	(1,2$^+$)		
x1262‡							
1370	11.1	2116.7	(1,2$^+$)	746.6	2$^+$		
x1394‡							
1443.7	0.3	1443.7	(1,2$^+$)	0.0	0$^+$		
1452.3	2.04	3306.8	(1,2$^+$)	1853.2	(1,2$^+$)		
1464	13.5	3317.0	(0,1,2)	1853.2	(1,2$^+$)		
1853.7	1.92	1853.2	(1,2$^+$)	0.0	0$^+$		
2110	0.46	4226.9	(1,2$^+$)	2116.7	(1,2$^+$)		
2116.7	1.24	2116.7	(1,2$^+$)	0.0	0$^+$		
2347	3.66	3093.4	(0,1,2)	746.6	2$^+$		
2374	0.59	4226.9	(1,2$^+$)	1853.2	(1,2$^+$)		
2562	7.4	3306.8	(1,2$^+$)	746.6	2$^+$		
3306		3306.8	(1,2$^+$)	0.0	0$^+$		
3480	1.33	4226.9	(1,2$^+$)	746.6	2$^+$		
4226.7	0.03	4226.9	(1,2$^+$)	0.0	0$^+$		

† From level scheme Fig. 5.1 of 2000HaZL, unless otherwise stated. As per E-mail (March 9, 2006) from author of 2000HaZL, corresponding values listed in Fig. 5.3 are preliminary.
‡ Assignment to ^{64}Mn decay is uncertain, could also belong to the decay of daughter activity (^{64}Fe) or grand-daughter (^{64}Co).
# 2006Ho20 mention that 746γ also seen independently by I. Matea (Ph.D. thesis, University de Caen (2003); ref. 15 in 2006Ho20).
@ γ identified (by 2006Ho20) from a spectrum obtained from the measurement by 1999Ha05. Intensity estimated by the evaluator from this spectrum.
& From the Adopted Gammas.
x γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ