Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Ota and E. A. Mccutchan	NDS 203,1 (2025)	1-Apr-2025

Q(β^-)=−15437 *syst*; S(n)=1.822×10^4 *9*; S(p)=3.8×10^2 *3*; Q(α)=−7.07×10^3 *5* 2021Wa16
ΔQ(β^-)=501 (2021Wa16).
S(2n)=33729 (syst) *302*, S(2p)=5.26E+3 *3*, Q(εp)=7.22E+3 *3* (2021Wa16).

1987Po04: Ni(^{58}Ni,X) E=55 MeV/A. LISE magnetic spectrometer at GANIL and ΔE/E Si telescope; 335 events in Mn spectrum for A=47 . First observation of ^{47}Mn.

1996Fa03: ^{9}Be(^{58}Ni,X) E=650 MeV/nucleon. Measured projectile-like fragments at 0° using Fragment Recoil Separator (FRS) at GSI. MUSIC ionization chamber, ΔE/E counter telescope and TOF by two scintillation detectors. Measured β^+ particles and protons from implanted ^{47}Mn; deduced $T_{1/2}$ and proton branching ratio.

2007Do17: Ni(^{58}Ni,X) with E=74.5 MeV/nucleon at GANIL. Fragments separated with SISSE/LISE3 and identification by energy loss, residual energy and time-of-flight measurements using two micro-channel plate (MCP) detectors and Si detectors. Ions implanted into (DSSSD) and measured Ep, Ip, p(t) using Si(Li) detector.

^{47}Mn Levels

Cross Reference (XREF) Flags

A ^{47}Fe $\varepsilon+\beta^+$ decay
B ^{9}Be(^{48}Mn,^{47}Mnγ)

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0	(5/2$^-$)	88.0 ms *13*	AB	%ε+%β^+=100; %εp<1.7 J$^\pi$: from systematics and assumption of being the mirror state of the ^{47}Ti ground state. $T_{1/2}$: from 2007Do17. Other: 100 ms *50* from 1996Fa09, using the whole spectrum including β^+ particles and protons. %εp: from 2007Do17. Other: >3.4 *9* (1996Fa09) using E(p)=651 *20*. Note that 2007Do17 did not observe protons at this energy. 2007Do17 argue that the small proton branching is consistent with the fact that the IAS in ^{47}Cr of the ^{47}Mn ground state is particle bound.
122.40 *20*	(7/2$^-$)	476 ps *25*	B	$T_{1/2}$: from τ=687 ps *17* (stat) *32* (syst) (2024Ut02); uncertainty combined in quadrature by evaluators.
1175.3 *8*	(9/2$^-$)		B	
1380.4 *8*	11/2$^-$		B	
2197.4 *21*			B	
2394.5 *10*	(9/2$^-$)		B	
2574.4 *22*	(13/2$^-$)		B	
2723.4 *13*			B	
2724.4 *13*	(15/2$^-$)		B	
2833.4 *10*	(11/2$^-$)		B	
3568.4 *16*	(17/2$^-$)		B	
7.04×10^3 *4*	(7/2$^-$)		A	%p=88.4 *9* E(level): from the observed proton energies, coincident γ-ray energies and the mass excesses of ^{46}Cr and ^{47}Mn ground states (2021Wa16). 2007Do17 report 7029 *161* using and earlier version of AME. %p: from 2007Do17. J$^\pi$: from assumed IAS of ^{47}Fe ground state.

† From a least-squares fit to Eγ, by evaluator.
‡ As proposed by 2022Ut02, based on mirror symmetry comparison to ^{47}Ti.

Adopted Levels, Gammas (continued)

γ(^{47}Mn)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[†]	Comments
122.40	(7/2$^-$)	122.4 *2*	100	0	(5/2$^-$)	M1	0.01781 *26*	α(K)=0.01604 *23*; α(L)=0.001555 *23*; α(M)=0.0002113 *31*; α(N)=9.95×10^{-6} *15* B(M1)(W.u.)=0.0249 *13* M1/E2 mixing ratio is unknown, by varying possible E2 component by a factor of 100, 2024Ut02 determine transition is dominant M1.
1175.3	(9/2$^-$)	1053 *1*	100 *5*	122.40	(7/2$^-$)			
		1175[‡] *5*	5 *4*	0	(5/2$^-$)			
1380.4	11/2$^-$	205 *1*	10.8 *22*	1175.3	(9/2$^-$)			
		1258 *1*	100 *5*	122.40	(7/2$^-$)			
2197.4		1022 *2*	100	1175.3	(9/2$^-$)			
2394.5	(9/2$^-$)	1220[‡] *3*	8 *6*	1175.3	(9/2$^-$)			
		2272 *1*	100 *10*	122.40	(7/2$^-$)			
2574.4	(13/2$^-$)	1194 *2*	100	1380.4	11/2$^-$			
2723.4		1548 *1*	100	1175.3	(9/2$^-$)			
2724.4	(15/2$^-$)	1344 *1*	100	1380.4	11/2$^-$			
2833.4	(11/2$^-$)	1453 *1*	6.7 *22*	1380.4	11/2$^-$			
		1658 *1*	100 *9*	1175.3	(9/2$^-$)			
3568.4	(17/2$^-$)	844[‡] *1*	100	2724.4	(15/2$^-$)			

[†] Additional information 1.
[‡] Placement of transition in the level scheme is uncertain.

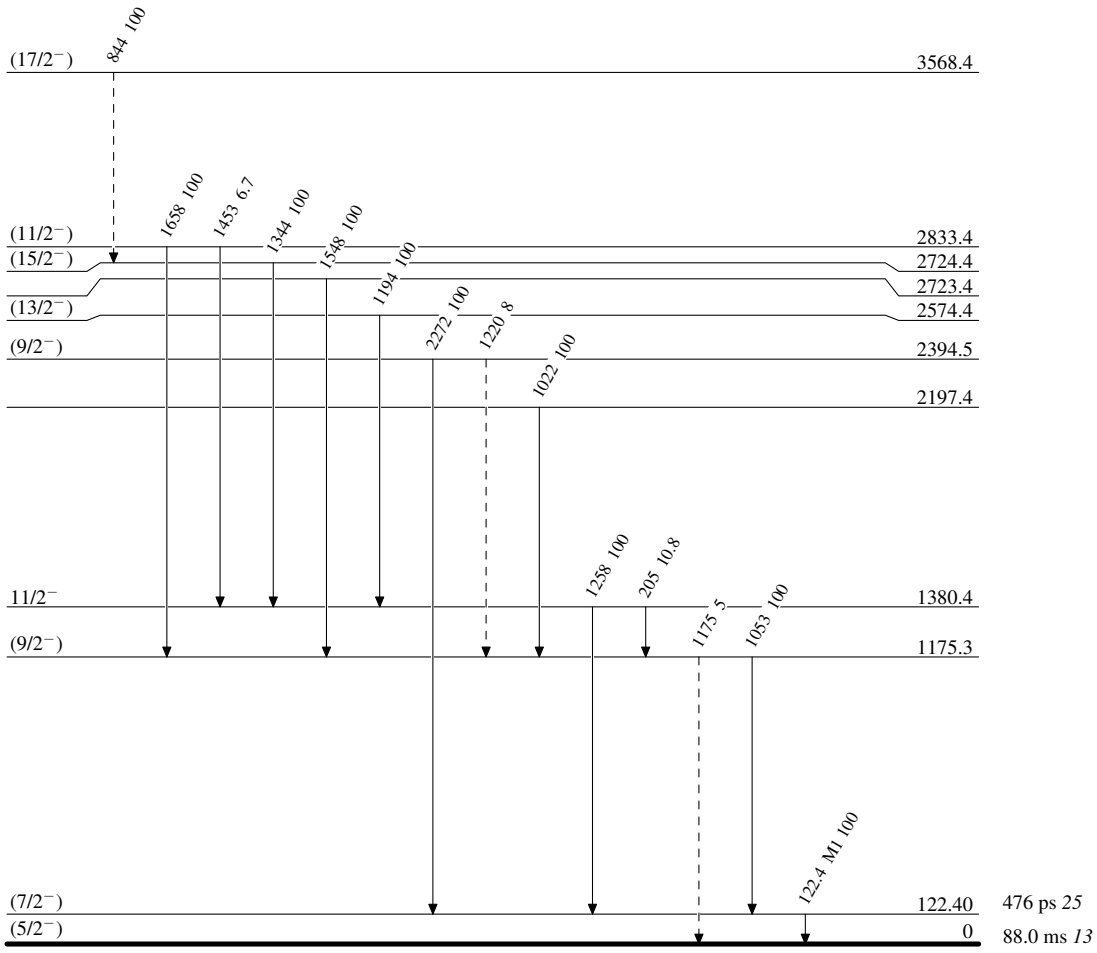
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{47}_{25}Mn_{22}$