Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	B. Singh	NDS 110,2815 (2009)	30-Sep-2009

S(n)=1.59×10^4 *syst*; S(p)=3.4×10^3 *syst*; Q(α)=−1.4×10^3 *syst* 2012Wa38
Note: Current evaluation has used the following Q record 15760 syst 3380 syst −1410 syst 2009AuZZ.
ΔS(n)=640, ΔS(p)=500, ΔQ(α)=1540 (syst,2009AuZZ).
Q(εp)=4120 *400* (syst,2009AuZZ).
Additional information 1.
Values in 2003Au03 are: S(n)=16130 *640*, S(p)=4140 *510*, Q(α)=−2710 *1540*, Q(εp)=3360 *410*; all from systematics.
^{84}**Mo evaluated by B. Singh**.

2007WeZX, 2002Fa13, 2001Ki13: ^{84}Mo isotope formed in the fragmentation of ^{112}Sn beam at 1 GeV/nucleon with nickel target using fragment separator FRS at GSI facility. Measured positrons, γ rays and isotopic half-life. These measurements are also described in two Ph.D. theses from the University of Munich in 2001 by E. Wefers and A. Stolz.
Additional information 2.

2001Ga24: ^{84}Mo produced by fragmentation of ^{92}Mo beam at 60 MeV/nucleon with nickel target at GANIL facility using LISE3 separator. Measured positrons as a function of time and suggested that ^{84}Mo half-life is in the range of few seconds. The authors quoted half-life of 3.6 s *7* from a conference report by the GSI group (2002Fa13).

2009St04: E=140 MeV/nucleon ^{124}Xe beam provided by coupled K500 and K1200 cyclotrons at NSCL, MSU. A1900 fragment separator used to analyze and separate ^{84}Mo fragments which were then implanted on double-sided silicon strip detector for β counting. Measured prompt and delayed γ rays using SeGA array of 16 Ge detectors. The half-life was measured from β decay events of 366 decay chains. From $\beta\gamma$ coin measurements, no γ rays could be assigned to ^{84}Nb.

This nuclide is important from structure point-of-view for several reasons e.g. N=Z nucleus and subsequent description of deformation trends; T=0 n-p pairing interaction; astrophysical significance as a 'waiting-point' nuclide in the rp process of nucleosynthesis in x-ray bursts, etc.
Structure calculations (deformation, yrast levels, etc.): 2006Sa25 (also 2006Sa45) (half-life=1-2 s); 2004Su08 (β_2 of ≈0.28), 2004Wa31 (β_2=0.37).

^{84}Mo Levels

Cross Reference (XREF) Flags

A ^{58}Ni(^{28}Si,2nγ),^{28}Si(^{58}Ni,2nγ)

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0‡	0$^+$†	2.3 s *3*	A	%ε+%β^+=100; %εp=? T=0 T$_{1/2}$: from β-correlated ^{84}Mo fragments; weighted average of 2.2 s *2* (2009St04) and 3.7 s *+10−8* (2007WeZX,2002Fa13,2001Ki13). Delayed proton decay is possible but none has been studied.
443.9‡ *2*	(2$^+$)†		A	
1117.3‡ *6*	(4$^+$)†		A	
2006.4‡ *8*	(6$^+$)†		A	
3069.4‡ *10*	(8$^+$)†		A	
4276.4‡ *15*	(10$^+$)†		A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{84}Mo Levels (continued)

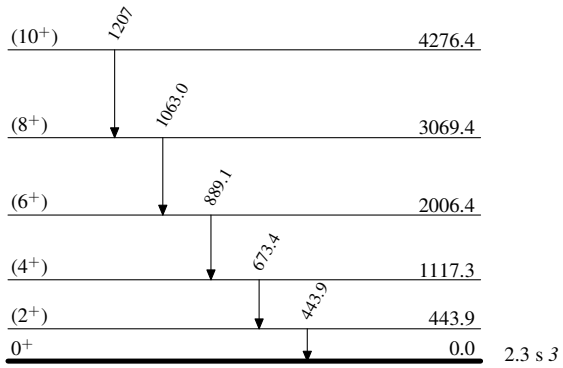
† Members of the yrast band based on g.s.; systematics of yrast structures of N=Z nuclei.
‡ Band(A): Yrast (g.s.) band. From comparison of yrast band structures with other N=Z nuclei, 2002Ma30 suggest that ^{84}Mo is moderately deformed ($\beta_2 \approx 0.26$) and that the alignment seems delayed, although, data for higher spins is needed to get a quantitative picture.

$\gamma(^{84}Mo)$

E_i(level)	J_i^π	E_γ	E_f	J_f^π	Comments
443.9	(2^+)	443.9 *2*	0.0	0^+	Mult.: possibly stretched quadrupole from observation of relative intensity of 444γ at 40°−163° geometry (1991Ge01).
1117.3	(4^+)	673.4 *5*	443.9	(2^+)	
2006.4	(6^+)	889.1 *6*	1117.3	(4^+)	
3069.4	(8^+)	1063.0 *6*	2006.4	(6^+)	
4276.4	(10^+)	1207 *1*	3069.4	(8^+)	

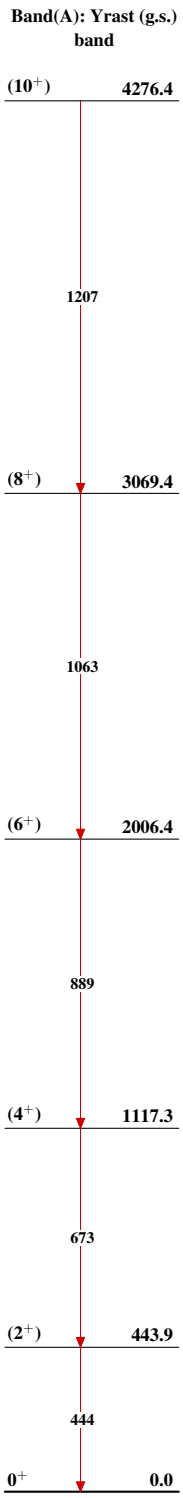
Adopted Levels, Gammas

Level Scheme



$^{84}_{42}Mo_{42}$

Adopted Levels, Gammas



$^{84}_{42}Mo_{42}$