Adopted Levels

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	20-Jul-2015

Q(β^-)=9085 *7*; S(n)=3460 *27*; S(p)=15090 *SY*; Q(α)=−8090 *SY* 2012Wa38
Estimated uncertainties (2012Wa38): 200 for S(p), 300 for Q(α).
Q(β^-n)=3023 *15*, S(2n)=9408 *17*, S(2p)=28320 *500* (syst) (2012Wa38).
1994Be24, 1997Be70, 1998Do08: ^{111}Mo produced and identified in Pb,Be(^{238}U,F), E=750 MeV/nucleon, followed by on-line fragment separator and time of flight method at GSI facility.
1997So07: ^{111}Mo formed in ^{208}Pb(^{238}U,F),E=20 MeV/nucleon, measured production σ.
2009Pe06 (also 2011Pe34): ^{111}Mo formed by fragmentation of ^{136}Xe beam at 120 MeV/nucleon at NSCL facility using Coupled Cyclotrons and A1900 fragment separator. The time-of-flight and transversal positions of each particle was measured using two plastic scintillators. The ΔE energy loss in a Si PIN detector was measured which, when combined with time-of-flight (tof) and transversal position measurements, allowed for an event-by-event identification of the transmitted nuclei. Transmitted nuclei and their β decays were measured using the β counting system consisting of four Si PIN detectors and a double-sided Si strip detector. β-delayed neutrons were measured in coincidence with β-decay precursor using neutron emission ratio observer (NERO) detector consisting of 60 proportional gas counter tubes embedded in polyethylene moderator matrix. The γ rays were measured with SeGA Ge detectors. Measured isotopic half-lives and delayed neutron emission probabilities Isotopic half-life was measured by 2009Pe06 from least-squares fit and maximum likelihood method of time differences of implantations and correlated β decay events.
2011Ku16: ^{111}Mo isotope produced in E=25 MeV deuteron-induced fission of natural uranium and separated using IGISOL3 mass separator at JYFL facility. Isobaric purification was achieved by JYFLTRAP Penning trap system and an MCP detector resulting in a monoisotopic beam of ^{111}Mo. The β and γ radiations were detected using plastic scintillators, two 120% Ge detectors, and a LEPS detector. Measured Eγ, Iγ, $\gamma\gamma$, γ(x ray) coin, $\beta\gamma$ coin, $T_{1/2}$ of ^{111}Mo. The authors suggest two activities, a low spin ($1/2^+$,$3/2^+$) of 186 ms *9* half-life and another of high spin ($7/2^-$,$9/2^-$) of ≈200 ms half-life.
2015Lo04: ^{111}Mo nuclide produced at RIBF-RIKEN facility in ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon with an average intensity of 6×10^{10} ions/s. Identification of ^{111}Mo was made by determining atomic Z and mass-to-charge ratio A/Q, where Q=charge state of the ions. The selectivity of ions was based on magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted at a rate of 50 ions/s in a stack of eight double-sided silicon-strip detector (WAS3ABi), surrounded by EURICA array of 84 HPGe detectors. Correlations were recorded between the implanted ions and β rays. The half-life of ^{111}Mo isotope was measured from the correlated ion-β decay curves and maximum likelihood analysis technique as described in 2014Xu07. Comparison of measured half-lives with FRDM+QRPA, KTUY+GT2 and DF3+CQRPA theoretical calculations.
Mass measurement: 2011Ha48.
2014Sa18, 2013Fa05, 1981Al25: theoretical calculation of $T_{1/2}$ and %β^-n.

^{111}Mo Levels

E(level)	J^π	$T_{1/2}$	Comments
0	($1/2^+$,$3/2^+$)	186 ms *9*	%β^-=100; %β^-n<12 (2009Pe06) Theoretical $T_{1/2}$=80.8 ms, %β^-n=0.03 (2003Mo09). J^π: from 2011Ku16 from systematics of neighboring nuclides and particle-plus-rotor model calculations. Others: $1/2^+$ from systematic trends (2012Au07), $7/2^-$ in theoretical prediction (1997Mo25). $T_{1/2}$: weighted average by 2011Ku16 from their decay curves for 10 γ rays and x rays (individual values in ms are: 176 *35*, 190 *30*, 266 *60*, 173 *17*, 163 *20*, 196 *30*, 212 *25*, 185 *25*, 180 *30*, 230 *40* and 260 *100*). Others: 196 ms *5* (2015Lo04, from (implanted ions)β correlated curves in time and position using maximum likelihood method); 200 ms *+41−36* (2009Pe06, from maximum likelihood method of time differences of implantations and correlated β decay events). Values in 2015Lo04 and 2009Pe06 could correspond to both the activities reported in 2011Ku16.
0+x	($7/2^-$,$9/2^-$)	≈200 ms	%β^-=100; %β^-n=? E(level): x=100 *50* (from systematic trends, 2012Wa38). $T_{1/2}$: from 2011Ku16. The half-life is only an estimate by 2011Ku16 since it could not be distinguished from the half-life of the g.s. J^π: from 2011Ku16 from systematics of neighboring nuclides and particle-plus-rotor model

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Adopted Levels (continued)

^{111}Mo Levels (continued)

E(level)	J^{π}	$T_{1/2}$	Comments
			calculations. Others: $7/2^-$ from systematic trends (2012Au07), $7/2^-$ in theoretical prediction (1997Mo25) for g.s.