^{98}Mo(^{7}Li,3nγ) 1988BiZU,1986Du04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 1745 (2009)	31-Dec-2008

1986Du04: E(^{7}Li)=30 MeV. Measured: Eγ, Iγ, $\gamma\gamma$(t), γ(t), I$\gamma(\theta)$, γ pol. Deduced: ^{102}Rh levels, J, π, mult, $T_{1/2}$.
1988BiZU: E(^{7}Li): not given. Measured Eγ, $\gamma\gamma$, $\gamma(\theta)$, ce. Deduced: ^{102}Rh levels, J^{π}.

^{102}Rh Levels

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
0.0	(1$^-$,2$^-$)	207.3 d *17*	J$^{\pi}$: J^{π}=2$^-$ assumed by 1986Du04.
41.90 *9*	2$^{(-)}$		
105.20 *9*	(1$^+$,2$^+$,3$^+$)		
140.6 *6*	6$^{(+)}$	3.742 y *10*	
154.43 *10*	5$^{(+)}$		
156.50 *10*			
178.5 *6*	(3)$^+$		
242.2 *6*	(7$^+$)		
263.7 *6*	(5$^+$)		
297.1 *6*	(7$^+$)		
359.5 *6*			
378.4 *6*	6$^{(+)}$		
399.4	(5,6,7)		
476.7 *6*			
682.6 *6*	6$^{(-)}$		
730.5 *6*	7$^{(-)}$		
760.6[#] *6*	8$^{(-)}$		
798.5?			
907.0[#] *6*	9$^{(-)}$		
950.1? *7*			
1132.8			
1270.2[#] *7*	10$^{(-)}$		
1544.0?			
1576.5[#] *7*	11$^{(-)}$		
2038.7[#] *7*	12$^{(-)}$		
2093.7? *7*			
2476.9[#] *7*	13$^{(-)}$		
2965.2[#] *7*	14$^{(-)}$		

[†] Level scheme is from 1988BiZU. Level energies from 1986Du04 have been recalculated by the evaluators based on results from 1988BiZU and 1990BiZY.
[‡] From Adopted Levels, unless otherwise specified.
[#] Band(A): member of a ΔJ=1 band on J$^{\pi}$=8$^-$ level.

^{98}Mo(^{7}Li,3nγ) 1988BiZU,1986Du04 (continued)

$\gamma(^{102}Rh)$

E_γ[‡]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[a]	$I_{(\gamma+ce)}$	Comments
(13.7 *5*)		154.43	$5^{(+)}$	140.6	$6^{(+)}$				>60	ΔE: Estimated by the evaluators. $I_{(\gamma+ce)}$: this value is needed to explain coincidence results.
(22.0)		178.5	$(3)^+$	156.50						
30.0 *1*	5 *1*	760.6	$8^{(-)}$	730.5	$7^{(-)}$	[M1]				
41.9 *1*	3 *1*	41.90	$2^{(-)}$	0.0	$(1^-,2^-)$					
47.95 *7*	20 *3*	730.5	$7^{(-)}$	682.6	$6^{(-)}$	[M1]				
51.30 *5*	6 *1*	156.50		105.20	$(1^+,2^+,3^+)$					
63.3 *1*	7 *1*	105.20	$(1^+,2^+,3^+)$	41.90	$2^{(-)}$					
81.30[@] *7*	20 *3*	378.4	$6^{(+)}$	297.1	(7^+)	[M1]				A_2=−0.15 *10*.
85.2[@] *1*	17 *3*	263.7	(5^+)	178.5	$(3)^+$					A_2=−0.12 *10*.
98.8 *1*		140.6	$6^{(+)}$	41.90	$2^{(-)}$	M4		337	0.23 *3*	Data taken from 1990BiZY. Transition not observed by 1986Du04. E_γ: uncertainty estimated by the evaluators.
101.55[@] *7*	25 *3*	242.2	(7^+)	140.6	$6^{(+)}$	[M1]				A_2=−0.16 *10*.
105.2 *1*	20 *3*	105.20	$(1^+,2^+,3^+)$	0.0	$(1^-,2^-)$					Mult.: A_2=0.0 AP.
117.2[@] *1*	6 *1*	476.7		359.5						A_2=−0.2.
135.6	68	399.4	(5,6,7)	263.7	(5^+)					E_γ: not observed by 1986Du04.
136.2	68	378.4	$6^{(+)}$	242.2	(7^+)					I_γ: complex peak. Probably sum of several components.
136.7	68	178.5	$(3)^+$	41.90	$2^{(-)}$					I_γ: complex peak. Probably sum of several components.
146.37[@] *8* [x]148	81 *5*	907.0	$9^{(-)}$	760.6	$8^{(-)}$	(M1+E2)	<0.08	0.119		A_2=−0.24 *3*, A_4=0.02 *5*. 1986Da04 assigned to 8^- level.
156.55[@] *8*	100	297.1	(7^+)	140.6	$6^{(+)}$	(M1+E2)	0.085 *35*	0.101		A_2=−0.34 *4*, A_4=+0.03 *6*.
205.2 *2*	10 *3*	359.5		154.43	$5^{(+)}$					A_2=−027 *7*. A_2 together with 206.0 G.
206.0 *2*	10 *3*	682.6	$6^{(-)}$	476.7						
213.0[@] *1*	10 *2*	476.7		263.7	(5^+)					A_2=−0.16 *7*, A_4=+0.07 *9*. Position of 213γ taken from 1990BiZY.
224.05[@] *8*	19 *2*	378.4	$6^{(+)}$	154.43	$5^{(+)}$	M1+E2	−0.35 *10*	0.0427 *23*		A_2=+0.33 *8*, A_4=+0.05 *12*$ Pol=−0.4 *2*.
234.7[@] *2*	3 *1*	476.7		242.2	(7^+)					A_2=−0.3 1.
237.78[&] *8*	18 *2*	378.4	$6^{(+)}$	140.6	$6^{(+)}$	M1+E2	+0.35 *10*	0.0362 *18*		A_2=+0.20 *8*, A_4=−0.02 *1* $ Pol=+0.48 *12*.
283.4[@] *1*	4 *1*	682.6	$6^{(-)}$	399.4	(5,6,7)					A_2=+0.20 *8*, A_4=−0.02 *11*.
304.10[&] *10*	45 *5*	682.6	$6^{(-)}$	378.4	$6^{(+)}$	E1(+M2)	−0.15 *15*			A_2=+0.32 *8*, A_4=−0.03 *10*$ Pol=−0.40 *12*. Mult.: admixture of M2 from theoretical and systematical point of view very unlikely.

$^{102}_{45}Rh_{57}$-2

^{98}Mo(^{7}Li,3nγ) 1988BiZU,1986Du04 (continued)

$\gamma(^{102}Rh)$ (continued)

E_γ[‡]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[a]	Comments
306.35 *8*	43 *5*	1576.5	$11^{(-)}$	1270.2	$10^{(-)}$	M1(+E2)	<0.1	0.0172	A_2=−0.19 *8*, A_4=+0.02 $ Pol=−0.1 *1*.
334.1 *2*	10 *2*	1132.8		798.5?		(M1,E2)			A_2=+0.19 *8*, A_4=0.0 $ Pol=+0.5 *8*. Mult.: ΔJ=0 or 2.
352.2 *2*	10 *3*	730.5	$7^{(-)}$	378.4	$6^{(+)}$				A_2=−0.39 *10*.
363.20[@] *8*	47 *5*	1270.2	$10^{(-)}$	907.0	$9^{(-)}$	M1(+E2)	<0.1	0.0112	A_2=−0.16 5, A_4=+0.02 8$ Pol=−0.3 1.
385.5 *1*	7 *1*	682.6	$6^{(-)}$	297.1	(7^+)				A_2=−0.15 *7*, A_4=0.0 *1*$ Pol=0.0 *2*.
433.4 *1*	6 *1*	730.5	$7^{(-)}$	297.1	(7^+)				A_2=−0.20 *4*, A_4=0.0 1$ Pol=+0.12 *1*.
438.2[@] *1*	6 *1*	2476.9	$13^{(-)}$	2038.7	$12^{(-)}$				A_2=−0.42 *12*, A_4=0.0 *1* $ Pol=−0.13 *10*.
440.3[@] *1*	11 *2*	682.6	$6^{(-)}$	242.2	(7^+)				A_2=−0.15 *5*, A_4=0.0 *1*$.
462.15 *10*	14 *3*	2038.7	$12^{(-)}$	1576.5	$11^{(-)}$	M1(+E2)	0.08 *8*		A_2=−0.30 *9*, A_4=0.1 *1* $ Pol=−0.13 *10*. Pol together with 463.55 G.
463.55 *10*	20 *3*	760.6	$8^{(-)}$	297.1	(7^+)				A_2=−0.06$ Pol=−0.13 *10*. Pol together with 462.15 G. Mult: ΔJ=(1) transition.
488.4 *3*	3 *1*	2965.2	$14^{(-)}$	2476.9	$13^{(-)}$				
528.36[@] *7*	32 *3*	682.6	$6^{(-)}$	154.43	$5^{(+)}$	E1			A_2=+0.30 *12*, A_4=+0.06 *10*.
556.2[b] *2*	18 *2*	798.5?		242.2	(7^+)	(M1,E2)			A_2=+0.19 *7*, A_4=0.0 *1*$ Pol=+0.38 *12*. Mult.: ΔJ=0 or 2.
590.0 *3*	4 *2*	730.5	$7^{(-)}$	140.6	$6^{(+)}$				
653.0[b] *3*	5 *1*	950.1?		297.1	(7^+)				A_2=−0.8 *1*, A_4=0.2 *1*$ Pol=−0.2 *2*. E_γ: observed by 1986Du04 only.
669.4 *2*	9 *1*	1576.5	$11^{(-)}$	907.0	$9^{(-)}$	(E2)			A_2=+0.27 *6*, A_4=−0.06 *10*.
745.5[b]		1544.0?		798.5?					E_γ: observed by 1988BiZU only.
769.2 *4*	3 *1*	2038.7	$12^{(-)}$	1270.2	$10^{(-)}$				
823.5[b] *3*	12 *2*	2093.7?		1270.2	$10^{(-)}$				E_γ: observed by 1986Du04 only. A_2=+0.06 *10*.
890.0 *3*	16 *2*	1132.8		242.2	(7^+)	(E2)			A_2=+0.28 *5*, A_4=−0.1 *1*.
900.3 *4*	6 *1*	2476.9	$13^{(-)}$	1576.5	$11^{(-)}$				A_2=0.
[x]914.0 *3*									
926.1 *5*	1.0 *5*	2965.2	$14^{(-)}$	2038.7	$12^{(-)}$				
[x]966.7 *4*									
[x]1014.5 *5*									
[x]1063.8 *6*									
[x]1134.5 *7*									

† From 1986Du04.
‡ From 1986Du04, unless noted otherwise.
# Unless noted otherwise, from $\gamma(\theta)$ and γ lin pol (1986Du04).

$^{102}_{45}Rh_{57}$-3

^{98}Mo(^{7}Li,3nγ) 1988BiZU,1986Du04 (continued)

$\gamma(^{102}Rh)$ (continued)

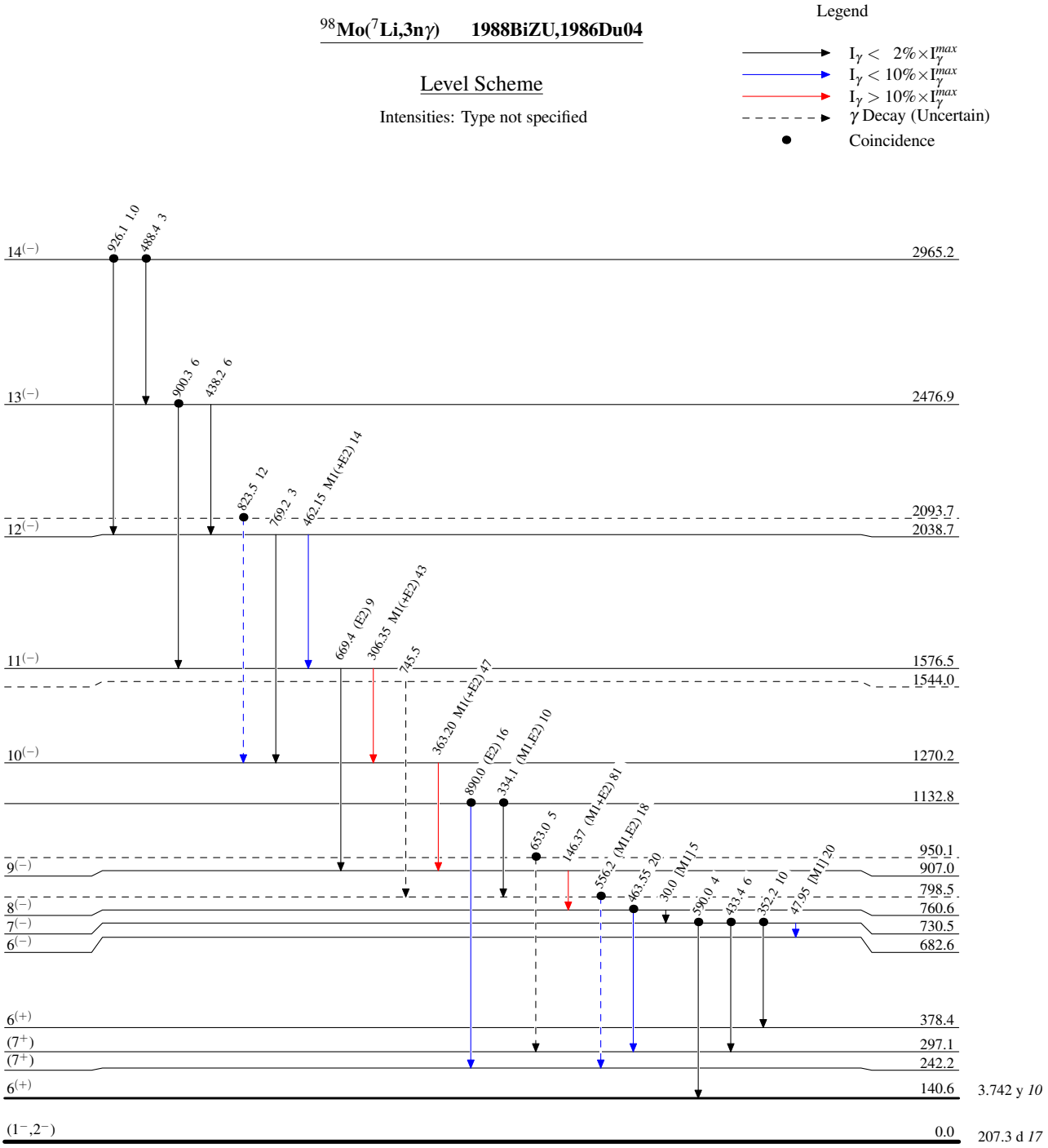
[@] ΔJ=1 transition.
[&] ΔJ=0 transition.
[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{102}_{45}Rh_{57}$-4

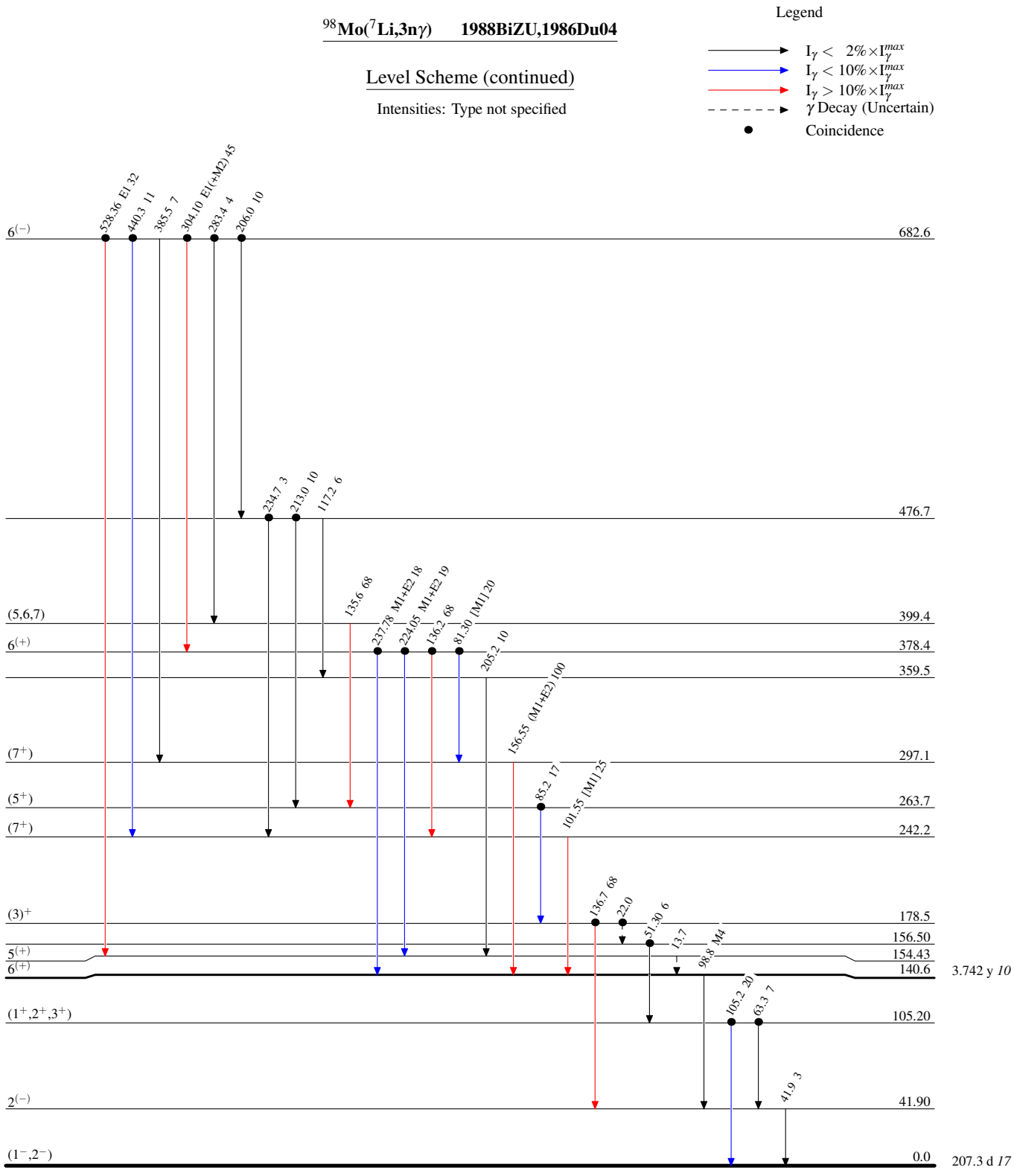
^{98}Mo(^{7}Li,3nγ) **1988BiZU,1986Du04**

Level Scheme

Intensities: Type not specified

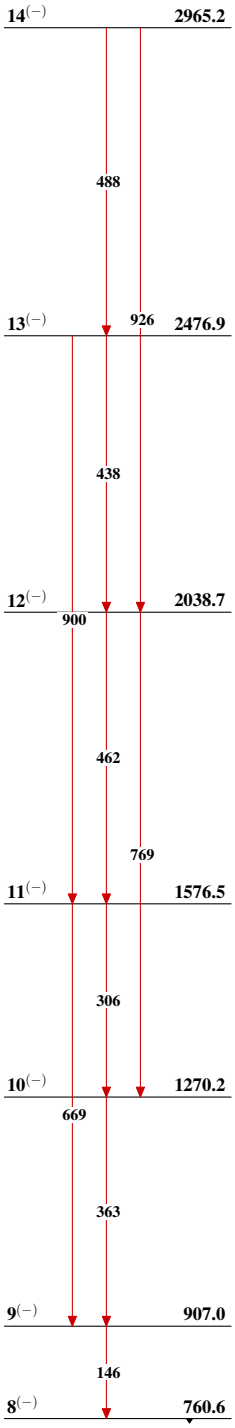


$^{102}_{45}Rh_{57}$


98Mo(7Li,3nγ) 1988BiZU,1986Du04
Level Scheme (continued)
Intensities: Type not specified
Legend
Iγ < 2%×Iγmax
Iγ < 10%×Iγmax
Iγ > 10%×Iγmax
γ Decay (Uncertain)
Coincidence
6(−)
682.6
528.36 E1 32
440.3 11
385.5 7
304.10 E1(+M2) 45
283.4 4
206.0 10
476.7
234.7 3
213.0 10
117.2 6
(5,6,7)
399.4
135.6 68
237.78 M1+E2 18
6(+)
378.4
224.05 M1+E2 19
136.2 68
81.30 [M1] 20
359.5
205.2 10
156.55 (M1+E2) 100
(7+)
297.1
(5+)
263.7
85.2 17
101.55 [M1] 25
(7+)
242.2
(3)+
178.5
136.7 68
22.0
156.50
51.30 6
13.7
5(+)
154.43
6(+)
140.6
3.742 y 10
98.8 M4
(1+,2+,3+)
105.20
105.2 20
63.3 7
2(−)
41.90
41.9 3
(1−,2−)
0.0
207.3 d 17
$^{102}_{45}Rh_{57}$

^{98}Mo(^{7}Li,3nγ) 1988BiZU,1986Du04

Band(A): Member of a ΔJ=1 band on $J^{\pi}=8^{-}$ level



$^{102}_{45}Rh_{57}$