^{98}Mo(^{6}Li,4nγ) 1984Ma30

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 172, 1 (2021)	31-Jan-2021

1984Ma30: E=35-45 MeV ^{6}Li beams were produced from the Brookhaven National Laboratory Tandem Van de Graaff. Target was a 4.5 mg/cm^2 enriched ^{98}Mo. γ rays were detected with two large Ge(Li) detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma$(t), $\gamma(\theta)$. Deduced levels, J, π, γ-ray multipolarities, isomer $T_{1/2}$. Comparisons with theoretical calculations.

1984Ma30 also report data on ^{100}Rh from ^{99}Ru(α,2n$p\gamma$), which provides the basic line identification, the observation of a new isomer, and a first tentative scheme while the (^{6}Li,4nγ) measurement has improved sensitivity. See ^{99}Ru(α,2n$p\gamma$) dataset for details.

^{100}Rh Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	1$^-$[#]		
32.73 *17*	(2)$^-$[#]	27.6[#] ns *6*	
74.87 *17*	(2)$^+$[#]	214.3[#] ns *20*	
107.6 *3*	(5$^+$)[#]	4.6[#] min *2*	%IT≈98.3; %ε+%β^+≈1.7
219.5 *3*	(7$^+$)	120 ns *5*	$T_{1/2}$: from (135.7γ)(111.9γ)(t).
243.4 *3*	(6)		
357.5 *3*	(6)		
438.6 *3*	(7)		
887.1 *4*	(8)		
1270.4 *3*	(8)	<0.1 ps	$T_{1/2}$: from Doppler broadening of 1050γ peak (1984Ma30).
1403.5 *4*	(9)		
1800.9 *4*	(10)		
2127.5 *5*	(11)		
2595.8 *5*	(12)		
3064.2 *5*	(13)		
3490.2 *11*	(14)		
3948.2 *15*	(15)		
4389.2 *18*	(16)		

[†] From least-squares fit to Eγ data.
[‡] As proposed by 1984Ma30 based on their $\gamma(\theta)$ data, unless otherwise noted. The assignments in the Adopted Levels are generally the same, except that parities are assigned for most levels based on other studies.
[#] From the Adopted Levels.

γ(^{100}Rh)

A_2 and A_4 values are from (^{6}Li,4n) and/or (α,2n$p\gamma$).

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]	Comments
32.7[@‡] *2*	30[@]	32.73	(2)$^-$	0.0	1$^-$		
32.7[@‡&] *2*	30[@]	107.6	(5$^+$)	74.87	(2)$^+$	[M3]	
42.1[‡] *2*	6	74.87	(2)$^+$	32.73	(2)$^-$		
74.9[@‡] *2*	66[@] *5*	74.87	(2)$^+$	0.0	1$^-$		
74.9[@‡] *2*	66[@] *5*	107.6	(5$^+$)	32.73	(2)$^-$	[E3]	
81.1 *2*	19 *3*	438.6	(7)	357.5	(6)	D+Q	A_2=−0.47 *8*; A_4=−0.05 *10*
111.9 *2*	100 *5*	219.5	(7$^+$)	107.6	(5$^+$)		A_2=+0.12 *3*; A_4=−0.02 *3*

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^{98}Mo(^{6}Li,4nγ) 1984Ma30 (continued)

$\gamma(^{100}Rh)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
133.0 *2*	85 *8*	1403.5	(9)	1270.4	(8)	D+Q	A_2=−0.38 *4*; A_4=+0.01 *5*
135.7 *2*	80 *5*	243.4	(6)	107.6	(5^+)		A_2=−0.15 *19*; A_4=+0.03 *17*
138.0 *2*	35 *3*	357.5	(6)	219.5	(7^+)	D(+Q)	A_2=−0.09 *6*; A_4=−0.02 *6*
195.1 *2*	68 *7*	438.6	(7)	243.4	(6)	D(+Q)	A_2=−0.33 *4*; A_4=+0.08 *5*
219.1 *2*	11 *2*	438.6	(7)	219.5	(7^+)		
249.9 *2*	39 *4*	357.5	(6)	107.6	(5^+)	D+Q	A_2=−0.44 *4*; A_4=+0.02 *5*
326.6 *2*	54 *6*	2127.5	(11)	1800.9	(10)	D(+Q)	A_2=−0.31 *4*; A_4=0.00 *5*
330.9 *2*	11 *2*	438.6	(7)	107.6	(5^+)		
383.2 *2*	17 *3*	1270.4	(8)	887.1	(8)		A_2=+0.17 *6*; A_4=+0.03 *8*
397.5 *2*	88 *8*	1800.9	(10)	1403.5	(9)	D(+Q)	A_2=−0.33 *5*; A_4=+0.07 *6*
426 *1*	38 *4*	3490.2	(14)	3064.2	(13)		
441 *1*		4389.2	(16)	3948.2	(15)		
448.4 *2*	59 *6*	887.1	(8)	438.6	(7)	D(+Q)	A_2=−0.18 *3*; A_4=0.00 *4*
458 *1*	14 *3*	3948.2	(15)	3490.2	(14)		
468.2[@] *2*	81[@] *9*	2595.8	(12)	2127.5	(11)	D(+Q)	A_2=−0.26 *5*; A_4=+0.09 *7*
468.2[@] *2*	81[@] *9*	3064.2	(13)	2595.8	(12)	D(+Q)	
516.4 *2*	29 *4*	1403.5	(9)	887.1	(8)		
723 *1*	28 *4*	2127.5	(11)	1403.5	(9)		
831.8 *2*	21 *4*	1270.4	(8)	438.6	(7)		
936.9 *2*	27 *4*	3064.2	(13)	2127.5	(11)		
1051.1 *2*	77 *4*	1270.4	(8)	219.5	(7^+)	D+Q	A_2=−0.48 *5*; A_4=+0.01 *5*

[†] From 1984Ma30.
[‡] Placements from the Adopted Gammas. These are transitions from 107.6 isomer through cascades: 74.9-32.7, 32.7-74.9 and 32.7-42.1-32.7. See also ^{100}Rh IT decay (4.6 min) for details.
[#] From $\gamma(\theta)$ data in 1984Ma30, with negative A_2 typically for ΔJ=1, dipole or dipole+quadrupole transitions.
[@] Multiply placed with undivided intensity.
[&] Placement of transition in the level scheme is uncertain.

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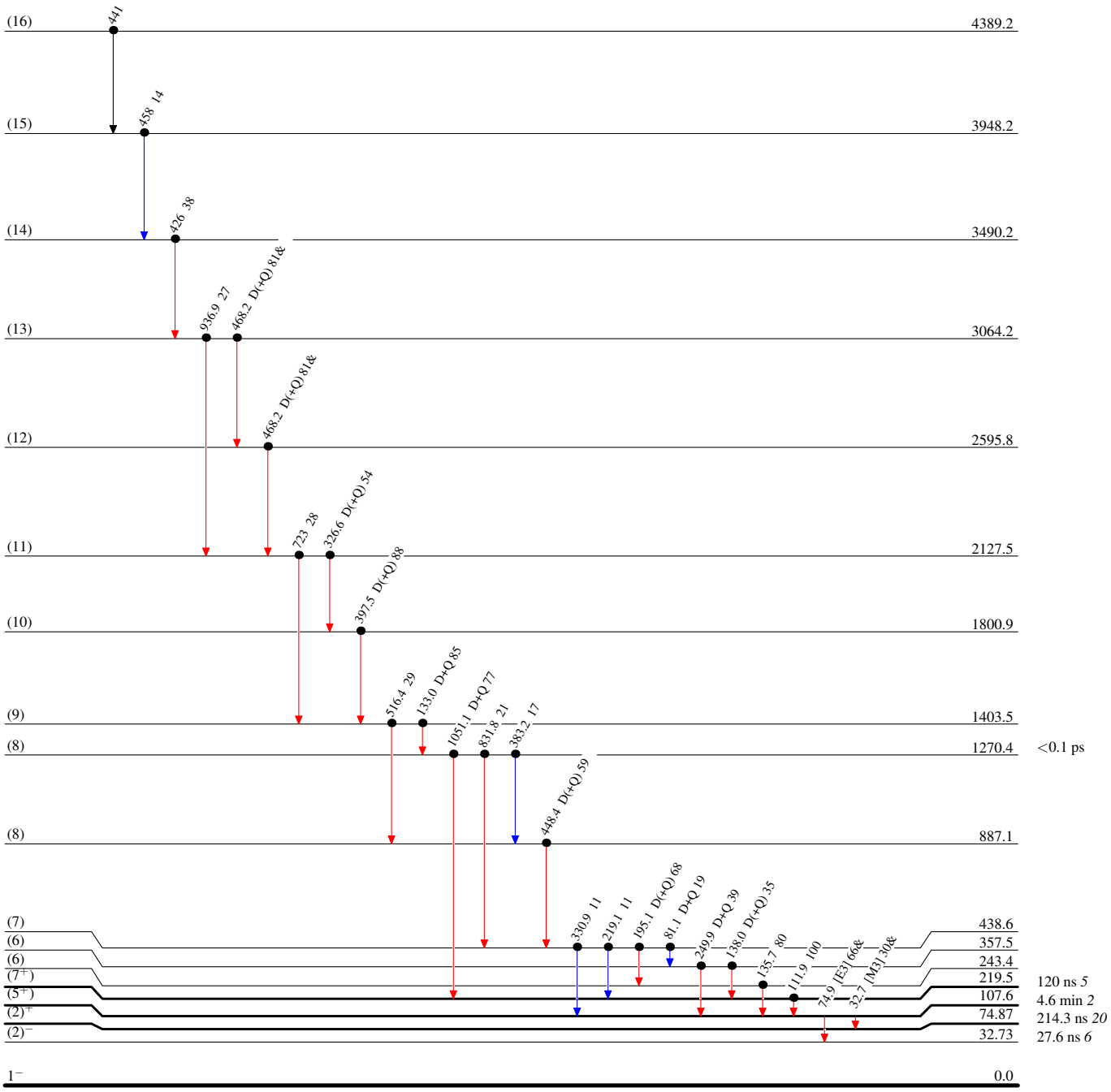
Level Scheme

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence



$^{100}_{45}Rh_{55}$

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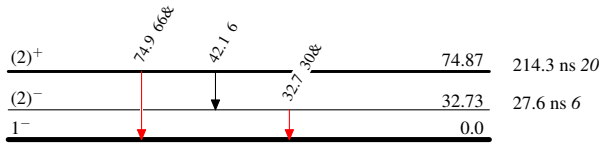
Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{100}_{45}Rh_{55}$