

$^{100}\text{Mo}(^{20}\text{Ne},\alpha 4n\gamma)$ **2007Ga45**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, F. G. Kondev		NDS 124, 157 (2015)	1-Aug-2014

Facility: Variable Energy Cyclotron Center, Kolkata; Beam: $E(^{20}\text{Ne})=136$ MeV; Target: 4.7 mg/cm², enriched to 99.54% in ^{100}Mo and evaporated on aluminium backing; Detectors: INGA multidetector array, comprising six Compton-suppressed Clover detectors; Measured: γ - γ , $E\gamma$, $I\gamma$, $\gamma\gamma(\theta)$, γ -polarization; Deduced: ^{112}Sn level scheme, γ -ray multipolarity, τ from DSAM, δ .

^{112}Sn Levels

E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]	$T_{1/2}$ [#]
0.0 [@]	0 ⁺	4928.3 4	(11) ⁻	
1256.61 ^{@ 10}	2 ⁺	5563.74 ^{& 23}	12 ⁺	0.66 ps 14
2247.11 ^{@ 14}	4 ⁺	5684.4 3	12 ⁺	
2520.12 20	4 ⁺	6362.34 ^{& 25}	14 ⁺	1.21 ps 28
2548.81 ^{@ 17}	6 ⁺	6397.7 ^{a 5}	(13) ⁻	
2783.62 22	4 ⁺	7206.5 ^{a 5}	(15) ⁻	
2926.1 3	6 ⁺	7213.6 ^{& 3}	16 ⁺	0.55 ps 10
2945.62 25	4 ⁺	8082.4 ^{a 4}	(17) ⁻	
3353.90 20	(7) ⁻	8146.6 ^{& 4}	18 ⁺	0.34 ps +8-10
3413.82 ^{& 17}	6 ⁺	9044.6 ^{a 6}	(19) ⁻	
3430.19 25	(8) ⁻	9186.1 ^{& 4}	20 ⁺	0.22 ps 6
3693.2 3	(9) ⁻	10075.6 ^{a 12}	(21) ⁻	
4077.43 ^{& 19}	8 ⁺	10335.2 ^{& 5}	22 ⁺	0.14 ps 4
4582.4 5	10 ⁻	11570.1 ^{& 7}	(24) ⁺	<0.35 ps
4680.6 3	(10 ⁺)	12965.1 ^{?& 13}	(26) ⁺	
4819.13 ^{& 21}	10 ⁺			

[†] From a least-squares fit to $E\gamma$'s.

[‡] From the Adopted Levels.

[#] From DSAM in **2007Ga45**.

[@] Band(A): Yrast sequence.

[&] Band(B): configuration= $\pi g_{9/2}^{-2} \otimes \pi g_{7/2}^2$. Above $J^\pi=12^+$, configuration= $\pi [g_{9/2}^{-2} g_{7/2}^2] \otimes \nu h_{11/2}^2$ due to the alignment of a pair of $h_{11/2}$ neutrons at $\hbar\omega \approx 0.35$ MeV.

^a Band(C): configuration= $\pi g_{9/2}^{-1} \otimes \pi h_{11/2}$. Also, possible configuration= $\pi [g_{9/2}^{-1} h_{11/2}] \otimes \nu h_{11/2}^2$ due to the alignment of $h_{11/2}$ neutrons before $J=17$.

$\gamma(^{112}\text{Sn})$

E_γ [†]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	δ [†]	Comments
76.3 2		3430.19	(8) ⁻	3353.90	(7) ⁻	M1+E2 [@]		E_γ : from the adopted gammas.
263.0 1	25.3 25	3693.2	(9) ⁻	3430.19	(8) ⁻	M1(+E2) [#]	+0.12 16	Mult.: DCO=0.78 11 (2007Ga45).
301.7 1	42.1 25	2548.81	6 ⁺	2247.11	4 ⁺	E2		Mult.: DCO=1.11 6 (2007Ga45); Pol _{DCO} =+0.06 3 (2007Ga45).
345.9 8	<1	4928.3	(11) ⁻	4582.4	10 ⁻	M1+E2 [@]		
377.2 3	2.7 10	2926.1	6 ⁺	2548.81	6 ⁺	M1 [@]		
427.8 3	2.3 11	3353.90	(7) ⁻	2926.1	6 ⁺	E1 [@]		
468.2 2	6.2 12	3413.82	6 ⁺	2945.62	4 ⁺	E2 [@]		
603.1 5	2.8 12	4680.6	(10 ⁺)	4077.43	8 ⁺			
630.2	10.2 7	3413.82	6 ⁺	2783.62	4 ⁺	E2 [@]		E_γ : uncertainty not listed by 2007Ga45 ,

Continued on next page (footnotes at end of table)

$^{100}\text{Mo}(^{20}\text{Ne},\alpha 4n\gamma)$ **2007Ga45 (continued)** $\gamma(^{112}\text{Sn})$ (continued)

E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
663.6 1	37.2 20	4077.43	8 ⁺	3413.82	6 ⁺	E2	assumed as 0.3 keV by evaluators for least-squares fit procedure. Mult.: DCO=0.93 9 (2007Ga45); Pol _{DCO} =+0.11 4 (2007Ga45).
678.1 8	<1	6362.34	14 ⁺	5684.4	12 ⁺		
741.7 1	33 4	4819.13	10 ⁺	4077.43	8 ⁺	E2	Mult.: DCO=1.04 10 for 741.7+744.6 (2007Ga45); Pol _{DCO} =+0.25 11 (2007Ga45).
744.6 1	21 4	5563.74	12 ⁺	4819.13	10 ⁺	E2	Mult.: DCO=1.04 10 for 741.7+744.6 (2007Ga45); Pol _{DCO} =+0.27 11 (2007Ga45).
798.6 1	25 4	6362.34	14 ⁺	5563.74	12 ⁺	E2	Mult.: DCO=0.99 12 (2007Ga45); Pol _{DCO} =+0.08 3 (2007Ga45).
805.1 1	37 5	3353.90	(7) ⁻	2548.81	6 ⁺	E1	Mult.: DCO=0.71 13 (2007Ga45); Pol _{DCO} =+0.06 3 (2007Ga45).
808.8 3	7.7 23	7206.5	(15) ⁻	6397.7	(13) ⁻		
851.3 1	21.1 22	7213.6	16 ⁺	6362.34	14 ⁺	E2	Mult.: DCO=1.05 13 (2007Ga45); Pol _{DCO} =+0.24 14 (2007Ga45).
865.3 2	8.8 24	5684.4	12 ⁺	4819.13	10 ⁺	E2@	
868.8 4	2.6 10	8082.4	(17) ⁻	7213.6	16 ⁺		
875.9 3	6.8 18	8082.4	(17) ⁻	7206.5	(15) ⁻		
883.2 3	8.6 23	5563.74	12 ⁺	4680.6	(10) ⁺		
893.7 3	6.4 21	3413.82	6 ⁺	2520.12	4 ⁺	E2@	
932.9 2	16 4	8146.6	18 ⁺	7213.6	16 ⁺	E2	Mult.: DCO=1.06 19 (2007Ga45); Pol _{DCO} =+0.22 14 (2007Ga45).
962.2 4	4.4 15	9044.6	(19) ⁻	8082.4	(17) ⁻		
987.4 3	11.1 24	4680.6	(10) ⁺	3693.2	(9) ⁻		
990.5 1	71 7	2247.11	4 ⁺	1256.61	2 ⁺	E2	Mult.: DCO=1.03 5 (2007Ga45); Pol _{DCO} =+0.07 3 (2007Ga45).
1031.0 10		10075.6	(21) ⁻	9044.6	(19) ⁻		
1039.5 2	13.8 18	9186.1	20 ⁺	8146.6	18 ⁺	E2#	Mult.: DCO=1.00 21 (2007Ga45).
1149.1 3	10.8 21	10335.2	22 ⁺	9186.1	20 ⁺	E2	Mult.: DCO=1.13 23 (2007Ga45).
1152.2 4	5.7 22	4582.4	10 ⁻	3430.19	(8) ⁻	E2@	
1166.7 1	16.8 17	3413.82	6 ⁺	2247.11	4 ⁺	E2#	Mult.: DCO=0.96 9 (2007Ga45).
1234.9 5	6.6 15	11570.1	(24) ⁺	10335.2	22 ⁺		
1235.1 2	12 3	4928.3	(11) ⁻	3693.2	(9) ⁻	E2@	
1256.6 1	100 3	1256.61	2 ⁺	0.0	0 ⁺	E2	Mult.: DCO=1.01 6 (2007Ga45); Pol _{DCO} =+0.05 2 (2007Ga45).
1263.5 2	5.9 16	2520.12	4 ⁺	1256.61	2 ⁺	E2@	
1395.0& 10		12965.1?	(26) ⁺	11570.1	(24) ⁺		
1469.4 4	9.5 19	6397.7	(13) ⁻	4928.3	(11) ⁻		
1527.0 2	11.9 23	2783.62	4 ⁺	1256.61	2 ⁺	E2@	
1689.0 6	5.1 11	2945.62	4 ⁺	1256.61	2 ⁺	E2@	

[†] From 2007Ga45, unless otherwise stated.

[‡] Based on the DCO and Pol_{DCO} measurements in 2007Ga45, unless otherwise stated.

Based only on DCO measurements in 2007Ga45.

@ From the adopted gammas.

& Placement of transition in the level scheme is uncertain.

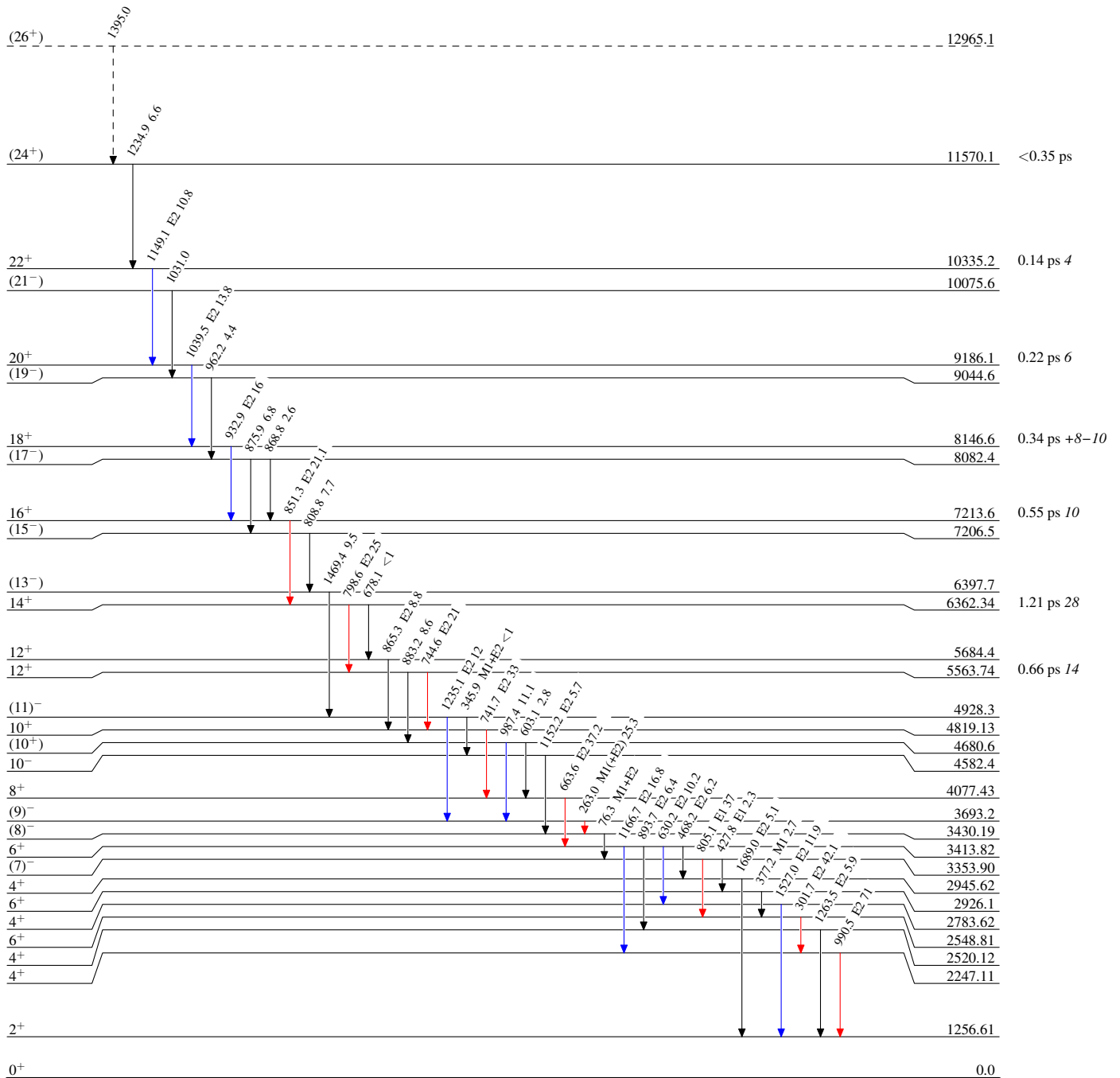
$^{100}\text{Mo}(\alpha n, \alpha 4n\gamma)$ 2007Ga45

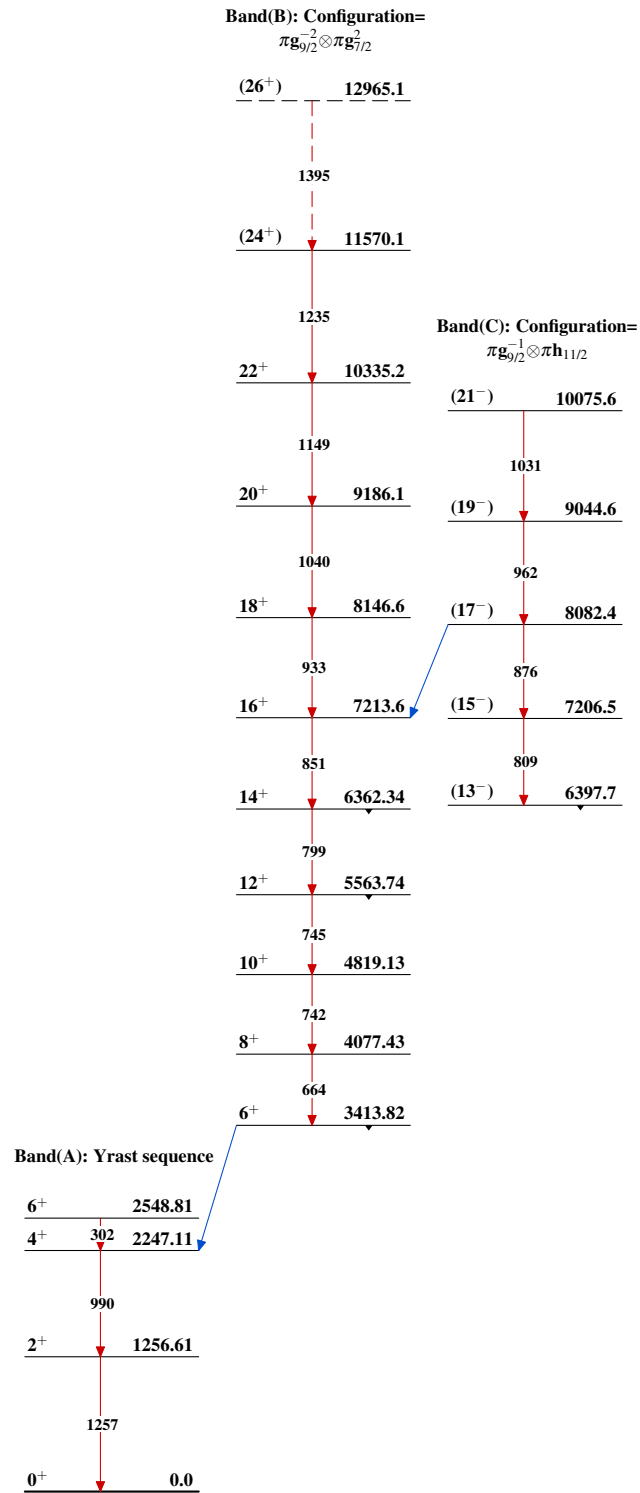
Legend

Level Scheme

Intensities: Relative I_γ

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

 $^{112}_{50}\text{Sn}_{62}$

$^{100}\text{Mo}(\text{}^{20}\text{Ne}, \alpha 4\text{n}\gamma) \text{}^{2007}\text{Ga45}$  $^{112}_{50}\text{Sn}_{62}$