^{160}Sm IT decay (1.8 μs) 2016Pa01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Parent: ^{160}Sm: E=2757.4 *8*; $J^{\pi}=(11^+)$; $T_{1/2}=1.8$ μs *4*; %IT decay=100.0

2016PA01: ^{9}Be(^{238}U,F), E=345 MeV/nucleon, measured in-flight fission fragments separated and identified by BigRIPS separator and ZeroDegree Spectrometer (ZDS); measured delayed Eγ, Iγ γ(t) using EURICA γ-ray spectrometer; deduced level scheme and isomer $T_{1/2}$; performed blocked-BCS and potential energy surface theoretical calculations.

Unless mentioned otherwise all data are from 2016Pa01.

^{160}Sm Levels

E(level)†	J^{π}‡	$T_{1/2}$	Comments
0.0#	0^+		
70.80# *20*	2^+		
232.7# *4*	4^+		
482.9# *5*	6^+		
1360.7 *5*	(5^-)	120 ns *46*	$T_{1/2}$: from Adopted Levels (measured by 2009Si21 in ^{252}Cf SF decay datastet). Two-quasiparticle configuration=$\pi 5/2^-[532]\otimes\pi 5/2^+[413]$; according to blocked-BCS calculations (2016Pa01) this configuration is preferred instead of $\nu 5/2[642]\otimes\nu 5/2[523]$ (2009Si21, ^{252}Cf SF decay).
1468.2@ *6*	(6^-)		Two-quasiparticle configuration=$\nu 5/2^-[523]\otimes\nu 7/2^+[633]$.
1601.8@ *7*	(7^-)		
1754.4@ *7*	(8^-)		
1925.9@ *7*	(9^-)		
2116.3@ *7*	(10^-)		
2325.4@ *8*	(11^-)		
2757.4 *8*	(11^+)	1.8 μs *4*	$T_{1/2}$: γ(t) (2016Pa01). Four-quasiparticle configuration=$\nu 5/2^-[523]\otimes\nu 7/2^+[633]$.

† From least-squares fit to Eγ values.

‡ g.s. rotational band: from Adopted Levels. Upper levels: tentatively assigned by 2016Pa01 based on tentative multipolarities, systematics and theoretical configurations. All values are adopted in the Adopted Levels for this nucleus.

Band(A): g.s. rotational band.

@ Band(B): Strongly-coupled rotational band based on (6^-). The assignment of (6^-) for bandhead rather than (5^-) is justified by 2016Pa01 by the lack of transition from (7^-) to (5^-).

γ(^{160}Sm)

E_γ	I_γ†	E_i(level)	J_i^{π}	E_f	J_f^{π}	Mult.‡	Comments
70.8 *2*		70.80	2^+	0.0	0^+	[E2]	E_γ: from Adopted Gammas. %branching=100.
107.5 *3*	26 *5*	1468.2	(6^-)	1360.7	(5^-)	[M1]	%branching=100.
x123							
133.5 *3*	53 *8*	1601.8	(7^-)	1468.2	(6^-)	[M1]	%branching=100.
x149							
152.3 *4*	45 *9*	1754.4	(8^-)	1601.8	(7^-)	[M1]	%branching=84 *25*.
161.9 *3*	91 *11*	232.7	4^+	70.80	2^+	[E2]	%branching=100.
171.4 *4*	24 *5*	1925.9	(9^-)	1754.4	(8^-)	[M1]	%branching=62 *17*.
190.4 *4*	30 *6*	2116.3	(10^-)	1925.9	(9^-)	[M1]	%branching=51 *12*.
209.1 *5*	6 *4*	2325.4	(11^-)	2116.3	(10^-)	[M1]	%branching=33 *25*.

Continued on next page (footnotes at end of table)

^{160}Sm IT decay (1.8 μs) 2016Pa01 (continued)

$\gamma(^{160}Sm)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
250.3 *4*	34 *6*	482.9	6^+	232.7	4^+	[E2]	%branching=100.
286.4 *4*	12 *3*	1754.4	(8^-)	1468.2	(6^-)	[E2]	%branching=16 *5*.
[x]316							
324.1 *4*	20 *5*	1925.9	(9^-)	1601.8	(7^-)	[E2]	%branching=38 *11*.
362.0 *3*	35 *6*	2116.3	(10^-)	1754.4	(8^-)	[E2]	%branching=49 *11*.
399.5 *5*	13 *4*	2325.4	(11^-)	1925.9	(9^-)	[E2]	%branching=67 52.
432.1 *4*	21 *5*	2757.4	(11^+)	2325.4	(11^-)	[E1]	%branching=25 *6*.
641.1 *3*	64 *9*	2757.4	(11^+)	2116.3	(10^-)	[E1]	%branching=75 *18*.
877.8 *4*	24 *5*	1360.7	(5^-)	482.9	6^+	[E1]	%branching=20 *5*.
1127.9 *4*	100	1360.7	(5^-)	232.7	4^+	[E1]	%branching=80 *19*.

[†] Relative intensities. In table comments: % branching ratios (corrected for electron conversion) from 2016Pa01.

[‡] Very tentative estimates from the intensity balances through the levels and the decay patterns only (no directly measured electron conversion coefficients and γ-ray angular correlations were performed).

[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ

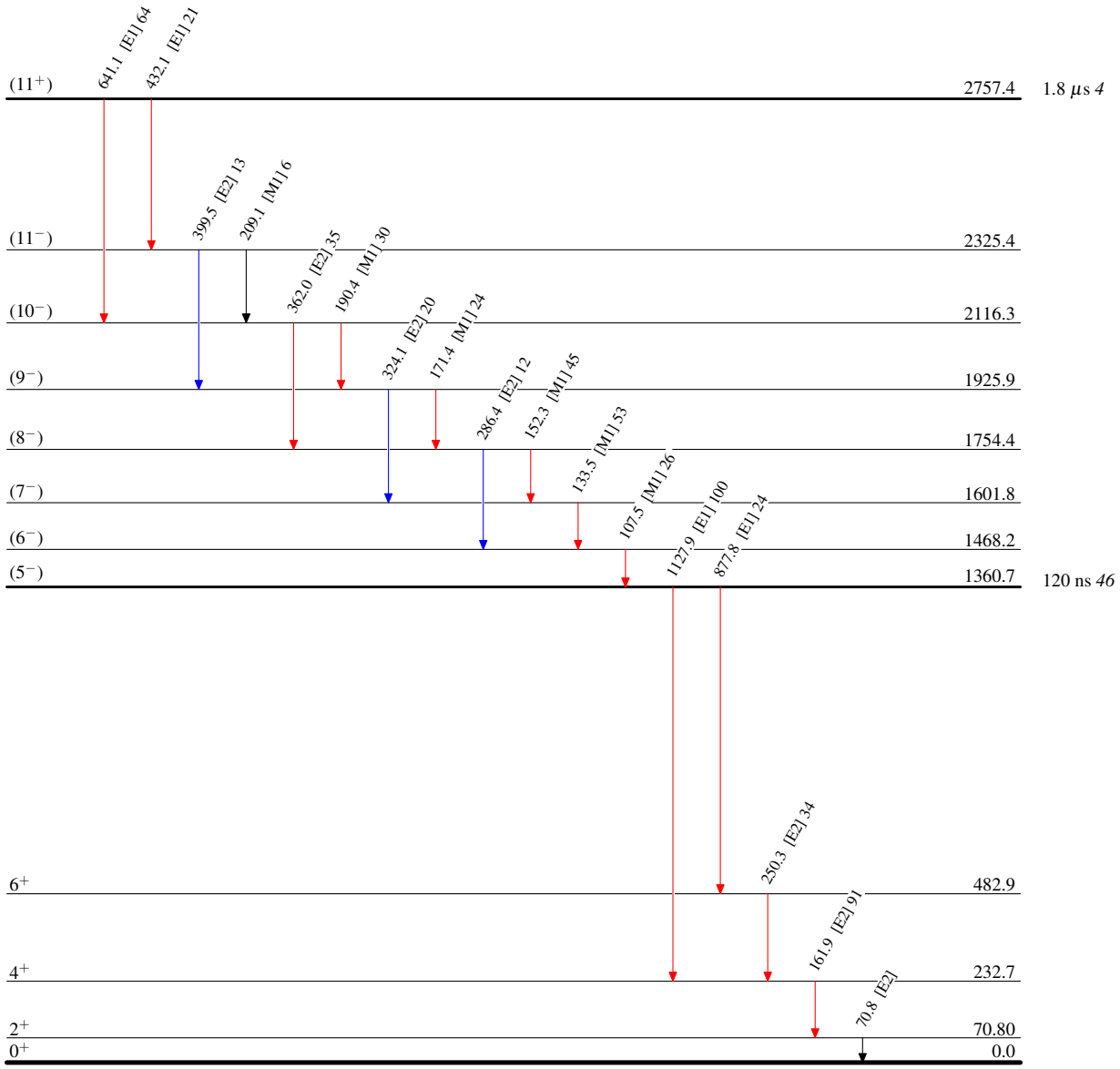
%IT=100.0

Legend

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

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

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



$^{160}_{62}Sm_{98}$

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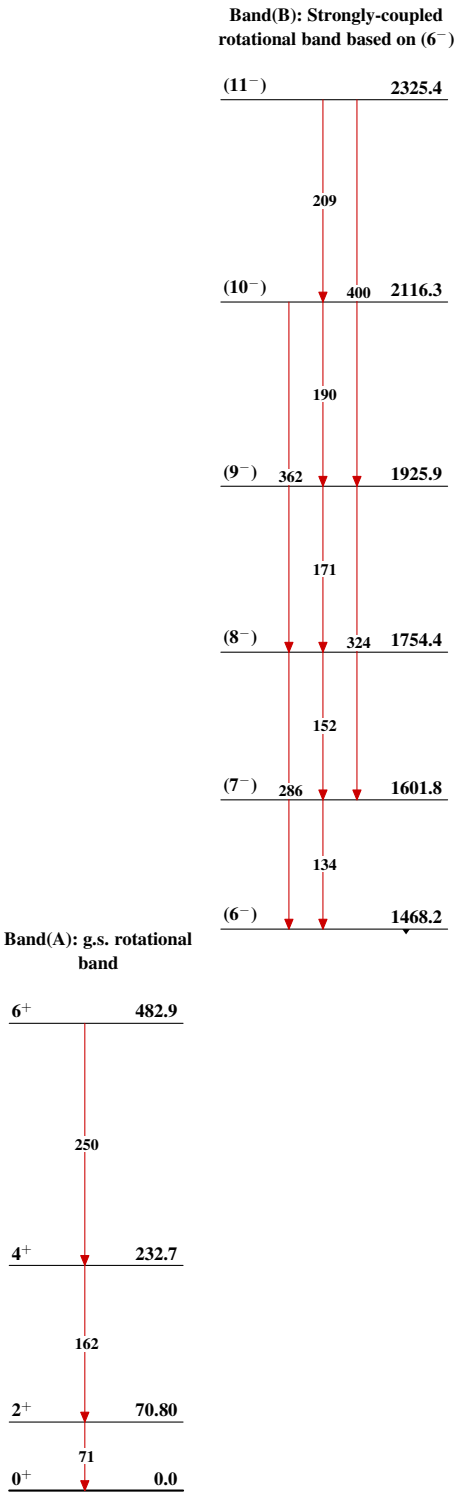

$^{160}_{62}Sm_{98}$