

<sup>252</sup>Cf SF decay    [1999Zh05,2001Ha14](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 110, 507 (2009)	1-Oct-2008

Parent: <sup>252</sup>Cf: E=0; J<sup>π</sup>=0<sup>+</sup>; T<sub>1/2</sub>=2.645 y 8; %SF decay=?

[Additional information 1.](#)

Measured E<sub>γ</sub>, I<sub>γ</sub>, γγ using GAMMASPHERE array with 72 Compton-suppressed Ge detectors. Others: [1999Ha10](#), [1999Zh08](#).

<sup>145</sup>La Levels

E(level) <sup>†</sup>	J <sup>π</sup> <sup>‡</sup>	T <sub>1/2</sub>	Comments
0.0 <sup>&amp;</sup>	(5/2 <sup>+</sup> )		
66.1 <sup>a</sup> 3	(7/2 <sup>+</sup> )	9 ns 2	T <sub>1/2</sub> : From <a href="#">1974CIZX</a> .
238.10 <sup>&amp;</sup> 24	(9/2 <sup>+</sup> )		
380.4 <sup>a</sup> 3	(11/2 <sup>+</sup> )		
572.4 <sup>#</sup> 3	(11/2 <sup>-</sup> )		
622.2 <sup>&amp;</sup> 3	(13/2 <sup>+</sup> )		
805.3 <sup>#</sup> 4	(15/2 <sup>-</sup> )		
810.6 <sup>a</sup> 4	(15/2 <sup>+</sup> )		
1095.1 <sup>&amp;</sup> 4	(17/2 <sup>+</sup> )		
1171.1 <sup>b</sup> 4	(17/2 <sup>-</sup> )		
1171.3 <sup>#</sup> 4	(19/2 <sup>-</sup> )		
1314.2 <sup>a</sup> 4	(19/2 <sup>+</sup> )		
1598.4 <sup>b</sup> 4	(21/2 <sup>-</sup> )		
1626.5 <sup>&amp;</sup> 4	(21/2 <sup>+</sup> )		
1646.9 <sup>#</sup> 5	(23/2 <sup>-</sup> )		
1862.0 <sup>a</sup> 4	(23/2 <sup>+</sup> )		
2117.0 <sup>b</sup> 5	(25/2 <sup>-</sup> )		
2186.1 <sup>@</sup> 6	(25/2 <sup>+</sup> )		
2210.0 <sup>#</sup> 6	(27/2 <sup>-</sup> )		
2426.6 <sup>a</sup> 5	(27/2 <sup>+</sup> )		
2687.7 <sup>@</sup> 6	(29/2 <sup>+</sup> )		
2714.3 <sup>b</sup> 5	(29/2 <sup>-</sup> )		
2845.6 <sup>#</sup> 6	(31/2 <sup>-</sup> )		
2998.0 <sup>a</sup> 5	(31/2 <sup>+</sup> )		
3150.0 <sup>@</sup> 6	(33/2 <sup>+</sup> )		
3390.1 <sup>b</sup> 6	(33/2 <sup>-</sup> )		
3409.7 <sup>#</sup> 7	(35/2 <sup>-</sup> )		
3595.8 <sup>@</sup> 7	(37/2 <sup>+</sup> )		
4152.5 <sup>@</sup> 7	(41/2 <sup>+</sup> )		

<sup>†</sup> Deduced by evaluators from least-squares fit to E<sub>γ</sub>'s, assuming Δ(E<sub>γ</sub>)=0.3 keV for each γ ray.

<sup>‡</sup> From Adopted Levels.

# Band(A): Rotational band based on (11/2<sup>-</sup>).

@ Band(B): Rotational band based on (25/2<sup>+</sup>).

& Band(C): (5/2<sup>+</sup>) g.s. rotational band, α=+1/2.

<sup>a</sup> Band(c): (5/2<sup>+</sup>) g.s. rotational band, α=-1/2.

<sup>b</sup> Band(D): (15/2<sup>-</sup>) rotational band.

$^{252}\text{Cf}$  SF decay [1999Zh05,2001Ha14](#) (continued)

$\gamma(^{145}\text{La})$						
$E_\gamma$	$I_\gamma$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. Comments
66.1		66.1	(7/2 <sup>+</sup> )	0.0	(5/2 <sup>+</sup> )	
142.3	40	380.4	(11/2 <sup>+</sup> )	238.10	(9/2 <sup>+</sup> )	
143.2	5.7 3	1314.2	(19/2 <sup>+</sup> )	1171.1	(17/2 <sup>-</sup> )	(E1) Mult.: from $\alpha(\text{exp})=0.05$ 5.
157.6 <sup>†</sup>	1.0 2	2845.6	(31/2 <sup>-</sup> )	2687.7	(29/2 <sup>+</sup> )	$E_\gamma$ : 157.9 in level scheme figures ( <a href="#">1999Zh05,2001Ha14</a> ).
172.0	110	238.10	(9/2 <sup>+</sup> )	66.1	(7/2 <sup>+</sup> )	
183.1	85 7	805.3	(15/2 <sup>-</sup> )	622.2	(13/2 <sup>+</sup> )	
185.9	0.6 1	3595.8	(37/2 <sup>+</sup> )	3409.7	(35/2 <sup>-</sup> )	
188.4	11	810.6	(15/2 <sup>+</sup> )	622.2	(13/2 <sup>+</sup> )	
192.0	8.0	572.4	(11/2 <sup>-</sup> )	380.4	(11/2 <sup>+</sup> )	
219.2	15	1314.2	(19/2 <sup>+</sup> )	1095.1	(17/2 <sup>+</sup> )	
232.9	50 2	805.3	(15/2 <sup>-</sup> )	572.4	(11/2 <sup>-</sup> )	
238.1	70	238.10	(9/2 <sup>+</sup> )	0.0	(5/2 <sup>+</sup> )	
241.8	35	622.2	(13/2 <sup>+</sup> )	380.4	(11/2 <sup>+</sup> )	
255.0	7.3 3	2117.0	(25/2 <sup>-</sup> )	1862.0	(23/2 <sup>+</sup> )	
263.6	9.3 5	1862.0	(23/2 <sup>+</sup> )	1598.4	(21/2 <sup>-</sup> )	
283.9	2.8 3	2998.0	(31/2 <sup>+</sup> )	2714.3	(29/2 <sup>-</sup> )	
284.3	24 2	1598.4	(21/2 <sup>-</sup> )	1314.2	(19/2 <sup>+</sup> )	
284.5	24	1095.1	(17/2 <sup>+</sup> )	810.6	(15/2 <sup>+</sup> )	
287.9 <sup>†</sup>	2.8 3	2714.3	(29/2 <sup>-</sup> )	2426.6	(27/2 <sup>+</sup> )	$E_\gamma$ : 287.6 in level scheme figures ( <a href="#">1999Zh05,2001Ha14</a> ).
289.8	9.0 2	1095.1	(17/2 <sup>+</sup> )	805.3	(15/2 <sup>-</sup> )	
304.6	5.6 3	3150.0	(33/2 <sup>+</sup> )	2845.6	(31/2 <sup>-</sup> )	
309.6	6.0 4	2426.6	(27/2 <sup>+</sup> )	2117.0	(25/2 <sup>-</sup> )	
312.2	4.7	1626.5	(21/2 <sup>+</sup> )	1314.2	(19/2 <sup>+</sup> )	
314.3	90	380.4	(11/2 <sup>+</sup> )	66.1	(7/2 <sup>+</sup> )	
334.3	70	572.4	(11/2 <sup>-</sup> )	238.10	(9/2 <sup>+</sup> )	
360.4	29	1171.1	(17/2 <sup>-</sup> )	810.6	(15/2 <sup>+</sup> )	
365.6	9	1171.1	(17/2 <sup>-</sup> )	805.3	(15/2 <sup>-</sup> )	
366.0	82	1171.3	(19/2 <sup>-</sup> )	805.3	(15/2 <sup>-</sup> )	
384.1	100	622.2	(13/2 <sup>+</sup> )	238.10	(9/2 <sup>+</sup> )	
392.0	1.5 1	3390.1	(33/2 <sup>-</sup> )	2998.0	(31/2 <sup>+</sup> )	
427.1 <sup>†</sup>	11 1	1598.4	(21/2 <sup>-</sup> )	1171.1	(17/2 <sup>-</sup> )	$E_\gamma$ : 427.5 in level scheme figures ( <a href="#">1999Zh05,2001Ha14</a> ).
430.2	100	810.6	(15/2 <sup>+</sup> )	380.4	(11/2 <sup>+</sup> )	
446.0	3.4 2	3595.8	(37/2 <sup>+</sup> )	3150.0	(33/2 <sup>+</sup> )	
455.2	5.4	1626.5	(21/2 <sup>+</sup> )	1171.3	(19/2 <sup>-</sup> )	$I_\gamma$ : from <a href="#">2001Ha14</a> . $I_\gamma=6.2$ 3 in <a href="#">1999Zh05</a> .
462.2	3.6 2	3150.0	(33/2 <sup>+</sup> )	2687.7	(29/2 <sup>+</sup> )	
472.9	32 4	1095.1	(17/2 <sup>+</sup> )	622.2	(13/2 <sup>+</sup> )	
475.6	48	1646.9	(23/2 <sup>-</sup> )	1171.3	(19/2 <sup>-</sup> )	
477.5 <sup>†</sup>	6.7 3	2687.7	(29/2 <sup>+</sup> )	2210.0	(27/2 <sup>-</sup> )	$E_\gamma$ : 477.9 in level scheme figures ( <a href="#">1999Zh05,2001Ha14</a> ).
501.6	1.0 1	2687.7	(29/2 <sup>+</sup> )	2186.1	(25/2 <sup>+</sup> )	
503.7	36 3	1314.2	(19/2 <sup>+</sup> )	810.6	(15/2 <sup>+</sup> )	
518.6	10 4	2117.0	(25/2 <sup>-</sup> )	1598.4	(21/2 <sup>-</sup> )	
531.4	7.1 4	1626.5	(21/2 <sup>+</sup> )	1095.1	(17/2 <sup>+</sup> )	
539.1	32	2186.1	(25/2 <sup>+</sup> )	1646.9	(23/2 <sup>-</sup> )	
547.9	14 1	1862.0	(23/2 <sup>+</sup> )	1314.2	(19/2 <sup>+</sup> )	
556.7	0.8	4152.5	(41/2 <sup>+</sup> )	3595.8	(37/2 <sup>+</sup> )	
559.6 <sup>‡</sup>	<0.5	2186.1	(25/2 <sup>+</sup> )	1626.5	(21/2 <sup>+</sup> )	$I_\gamma$ : <1.0 in <a href="#">1999Zh05</a> .
563.2	28	2210.0	(27/2 <sup>-</sup> )	1646.9	(23/2 <sup>-</sup> )	
564.0	1.0	3409.7	(35/2 <sup>-</sup> )	2845.6	(31/2 <sup>-</sup> )	
564.6	8.9 4	2426.6	(27/2 <sup>+</sup> )	1862.0	(23/2 <sup>+</sup> )	
571.3	3.7 3	2998.0	(31/2 <sup>+</sup> )	2426.6	(27/2 <sup>+</sup> )	
597.2	6.0 4	2714.3	(29/2 <sup>-</sup> )	2117.0	(25/2 <sup>-</sup> )	
635.8	11.0 5	2845.6	(31/2 <sup>-</sup> )	2210.0	(27/2 <sup>-</sup> )	
675.8	2.0 1	3390.1	(33/2 <sup>-</sup> )	2714.3	(29/2 <sup>-</sup> )	

Continued on next page (footnotes at end of table)

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${}^{252}\text{Cf}$  SF decay [1999Zh05,2001Ha14](#) (continued)

$\gamma({}^{145}\text{La})$  (continued)

† From Table I of [1999Zh05](#). The value given in figures ([1999Zh05,2001Ha14](#)) is slightly different.

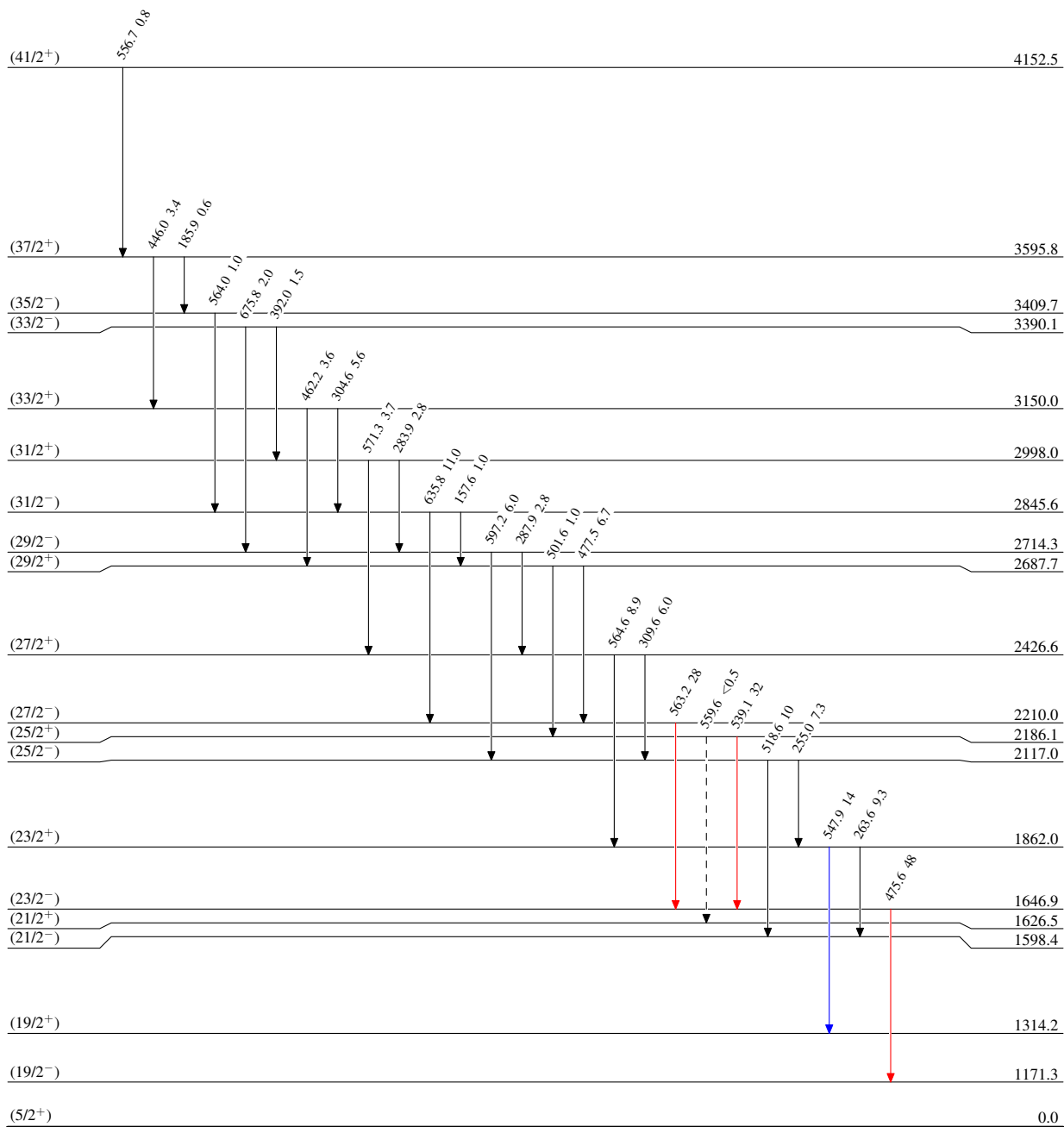
‡ Placement of transition in the level scheme is uncertain.

<sup>252</sup>Cf SF decay 1999Zh05,2001Ha14

Legend

Level Scheme  
Intensities: Relative I<sub>γ</sub>

- ▶ I<sub>γ</sub> < 2% × I<sub>γ</sub><sup>max</sup>
- ▶ I<sub>γ</sub> < 10% × I<sub>γ</sub><sup>max</sup>
- ▶ I<sub>γ</sub> > 10% × I<sub>γ</sub><sup>max</sup>
- - -▶ γ Decay (Uncertain)



<sup>145</sup><sub>57</sub>La<sub>88</sub>

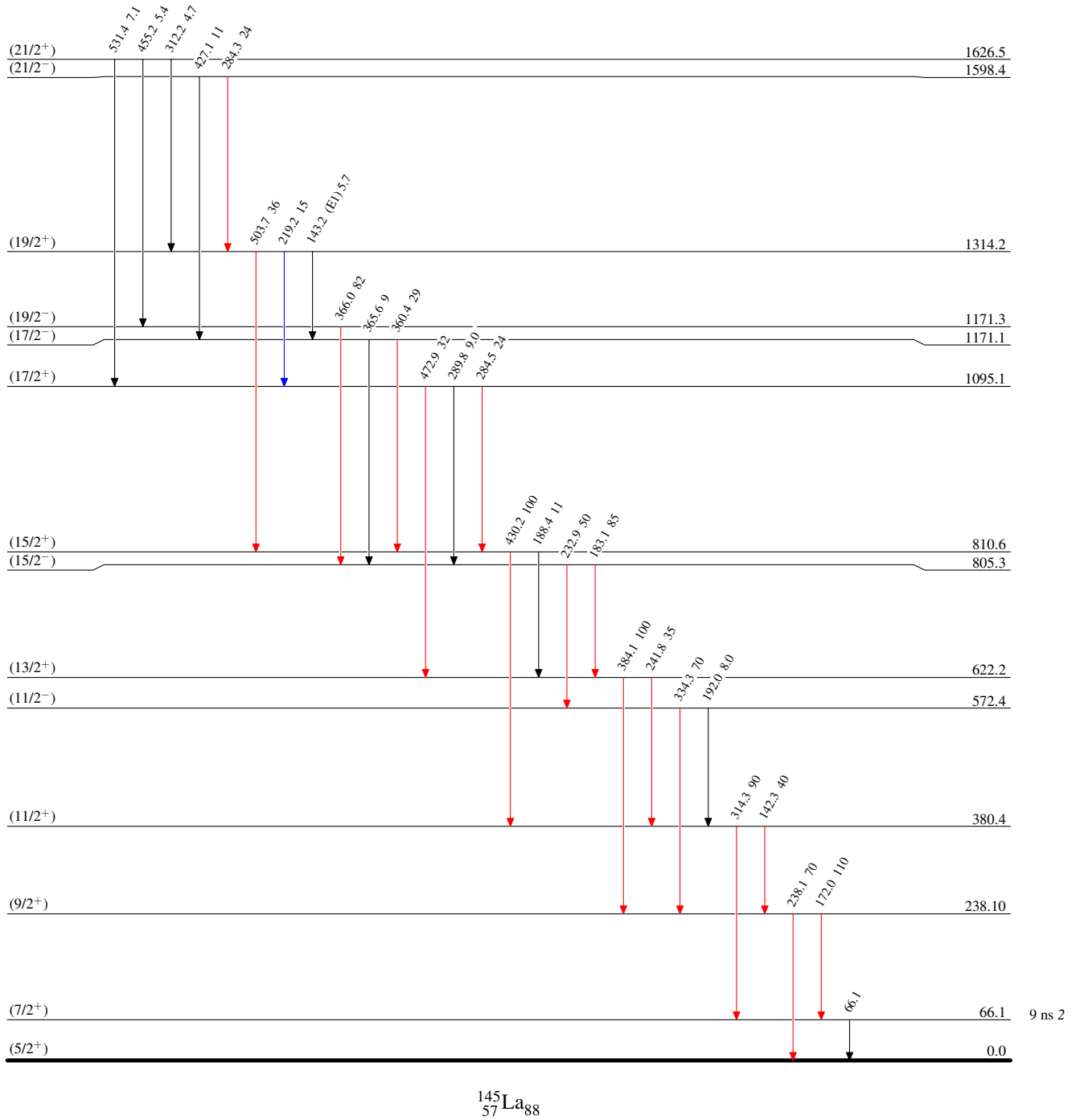
$^{252}\text{Cf}$  SF decay 1999Zh05,2001Ha14

Level Scheme (continued)

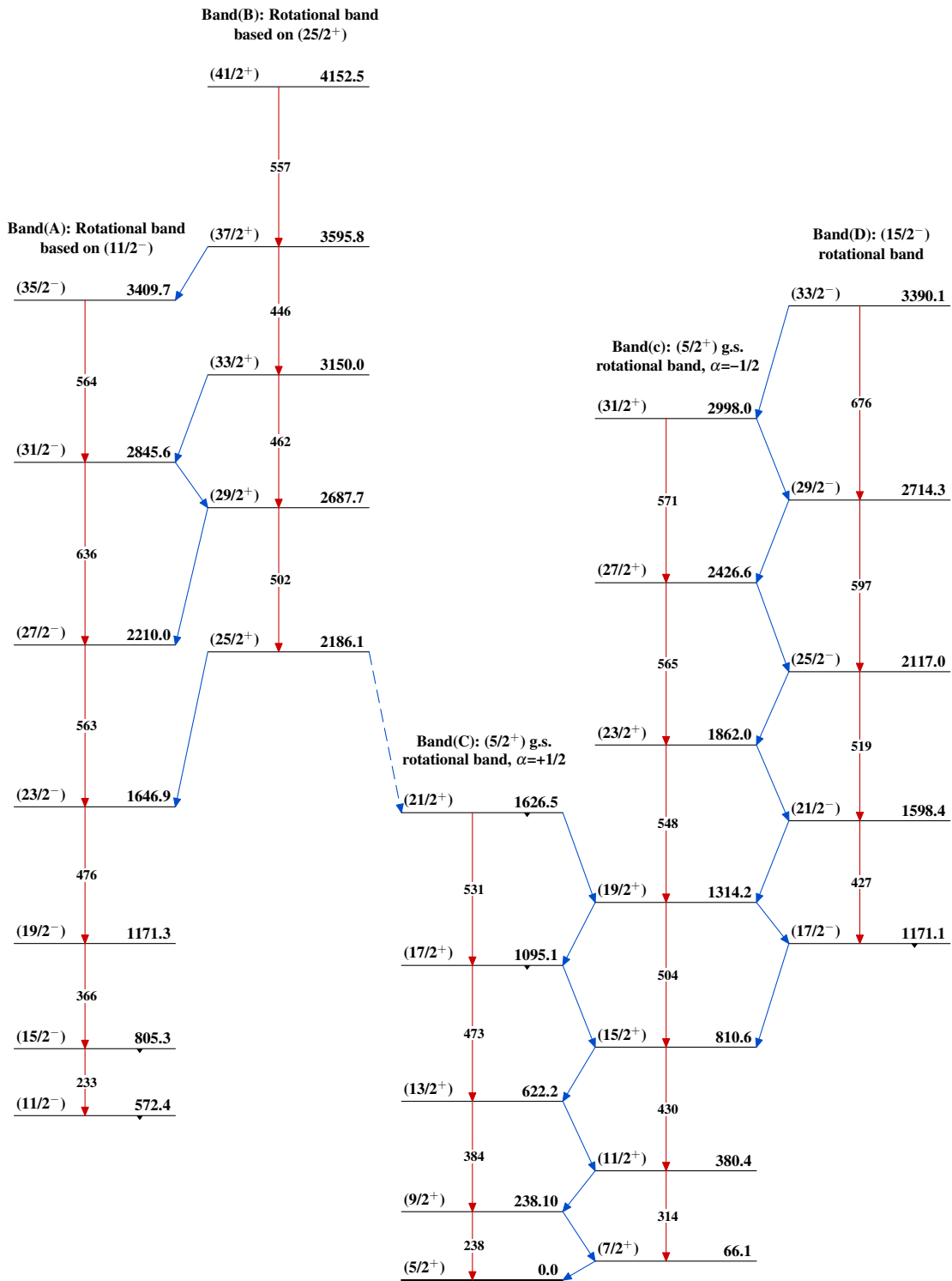
Intensities: Relative  $I_\gamma$

Legend

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



$^{252}\text{Cf}$  SF decay 1999Zh05,2001Ha14



$^{145}_{57}\text{La}_{88}$