^{136}Sm ε decay 1989Vi04

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152, 331 (2018)	1-Apr-2018

Parent: ^{136}Sm: E=0.0; $J^\pi=0^+$; $T_{1/2}$=47 s *2*; Q(ε)=4360 *70*; %ε+%$β^+$ decay=100.0

1989Vi04: ^{136}Sm activity from ^{92}Mo(^{46}Ti,2p) with E(^{92}Mo)=192 MeV followed by mass separation. Measured Eγ, Iγ, K x ray, Xγ, γγ, βγ, γ±, γ(t) using Si(Au) ΔE-E telescope, thin planar HPGe x-ray detector, thick plastic scintillator and n-type Ge detector.

1988Ke03: ^{136}Sm activity from ^{92}Mo(^{46}Ti,2p) with E(^{92}Mo)=170 MeV followed by mass separation. Measured Eγ, Iγ, γγ, x-rays using a Ge(Li) detector and Ge-γ-X detector. Measured γ, γγ, Xγ, γ(t). $T_{1/2}$(^{136}Pm)=47 s *2*. All the γ′s seen by 1988Ke03 are also seen by 1989Vi04.

1982Al07: ^{136}Sm activity from W,Ta(p,X) with E(p)=1 MeV followed by mass separation. Measured Eγ, Iγ, K x ray, γ(t), X(t) using HPGe, Ge(Li) and Si(Li) detectors.

As the isomer excitation energy is unknown, γ rays have unknown multipolarities and there is a large gap between the highest observed level (862 keV+x) and the decay Q value of over 4 MeV, the decay scheme is considered incomplete and no attempt is made to derive a normalization or β feeding intensities.

^{136}Pm Levels

E(level)†	Jπ‡	$T_{1/2}$‡	Comments
x	(2)	300 s *50*	Additional information 1.
114.42+x *13*	1^+		
123.35+x *19*			
221.1+x *4*			
286.90+x *15*	(1^+)		
299.30+x *21*			
306.51+x *20*			
315.3+x *3*			
422.45+x *19*			
427.95+x *18*			
485.30+x *16*			
563.23+x *22*			
802.45+x *24*			
862.13+x *20*			

† From a least-squares fit to Eγ, by evaluator.
‡ From the Adopted Levels.

γ(^{136}Pm)

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Comments
x90.0 *4*	1.7 *5*					
x91.1 *5*	0.6 *2*					
x100.2 *5*	0.8 *2*					
114.4 *2*	100 *10*	114.42+x	1^+	x	(2)	
116.1 *4*	1.1 *5*	422.45+x		306.51+x		
123.4 *3*	6 *1*	123.35+x		x	(2)	
128.8 *5*	0.6 *2*	427.95+x		299.30+x		I_γ: other: 0.3 *1* (1988Ke03).
134.9 *4*	1.4 *2*	563.23+x		427.95+x		I_γ: other: 0.5 *1* (1988Ke03).
x135.5 *5*	0.2 *2*					
140.6 *3*	≈1	427.95+x		286.90+x	(1^+)	I_γ: other: 0.5 *1* (1988Ke03).
141.4 *4*	1.2 *5*	563.23+x		422.45+x		I_γ: other: 0.5 *1* (1988Ke03).
163.3 *4*	1.5 *3*	286.90+x	(1^+)	123.35+x		
170.0 *5*	0.6 *1*	485.30+x		315.3+x		

Continued on next page (footnotes at end of table)

^{136}Sm ε decay 1989Vi04 (continued)

γ(^{136}Pm) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Comments
172.4 *3*	2.3 *5*	286.90+x	(1$^+$)	114.42+x	1$^+$	I_γ: other: 2.7 *1* (1988Ke03).
183.2 *3*	2.1 *5*	306.51+x		123.35+x		
185.0 *3*	1.9 *5*	299.30+x		114.42+x	1$^+$	I_γ: other: 4.1 *2* (1988Ke03).
186.1 *4*	0.6 *1*	485.30+x		299.30+x		
192.0@ *4*	1.8@ *4*	306.51+x		114.42+x	1$^+$	I_γ: other: 0.9 *1* for 192.6 *2* transition placed as soley depopulating the 307+x level (1988Ke03).
192.0@ *4*	0.9@ *2*	315.3+x		123.35+x		
200.7 *5*	0.7 *1*	315.3+x		114.42+x	1$^+$	I_γ: other: 0.9 *1* (1988Ke03).
206.9 *5*	1.5 *5*	427.95+x		221.1+x		
221.2 *5*	1.5 *5*	221.1+x		x	(2)	
x270.4 *4*	1.8 *5*					
276.3 *5*	0.8 *2*	563.23+x		286.90+x	(1$^+$)	
286.8 *2*	12 *3*	286.90+x	(1$^+$)	x	(2)	I_γ: other: 13 *3* (1988Ke03).
299.3@ *4*	6@ *1*	299.30+x		x	(2)	
299.3@ *4*	≈2@	422.45+x		123.35+x		
306.6 *4*	1.6 *3*	306.51+x		x	(2)	
313.6 *2*	13 *3*	427.95+x		114.42+x	1$^+$	I_γ: other: 12.6 *2* (1988Ke03).
x350.5‡ *3*	2.1 *5*					
x368.7# *3*	1.1 *1*					
371.0 *5*	1.8 *5*	485.30+x		114.42+x	1$^+$	I_γ: other: 3.2 *2* (1988Ke03).
377.0 *4*	2.5 *5*	862.13+x		485.30+x		I_γ: other: 1.7 *1* (1988Ke03).
380.0 *3*	2.0 *3*	802.45+x		422.45+x		I_γ: other: 3.2 *2* for a 379.4γ which 1988Ke03 place as depopulating a level at 493.9+x.
422.6 *3*	2.4 *3*	422.45+x		x	(2)	
434.5& *2*	0.7 *1*	862.13+x		427.95+x		E_γ,I_γ: from 1988Ke03, γ not observed by 1989Vi04.
448.7 *3*	2.7 *3*	563.23+x		114.42+x	1$^+$	I_γ: other: 2.2 *1* (1988Ke03).
x454.9# *2*	1.2 *1*					
485.3 *2*	14 *3*	485.30+x		x	(2)	I_γ: other: 1.2 *4* (1988Ke03).
515.6 *5*	0.4 *1*	802.45+x		286.90+x	(1$^+$)	I_γ: other: 2.1 *3* (1988Ke03).
555.5 *4*	1.8 *4*	862.13+x		306.51+x		
747.7 *2*	15 *2*	862.13+x		114.42+x	1$^+$	I_γ: other: 2.7 *11* (1988Ke03).
802.4 *4*	7 *2*	802.45+x		x	(2)	
x1260.0 *5*	≈2					

† From 1989Vi04, except where noted. Iγ values from 1988Ke03 are included in the comments.
‡ 1988Ke03 report a 350.0 *2* transition with Iγ=1.4 *1* which they place as a single transition depopulating a level at 464.5+x.
# From 1988Ke03. The 369γ and 455γ are placed by 1988Ke03 as depopulating levels at 862+x and 569+x, respectively. As these placements were not confirmed by 1989Vi04, there are not adopted here.
@ Multiply placed with intensity suitably divided.
& Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

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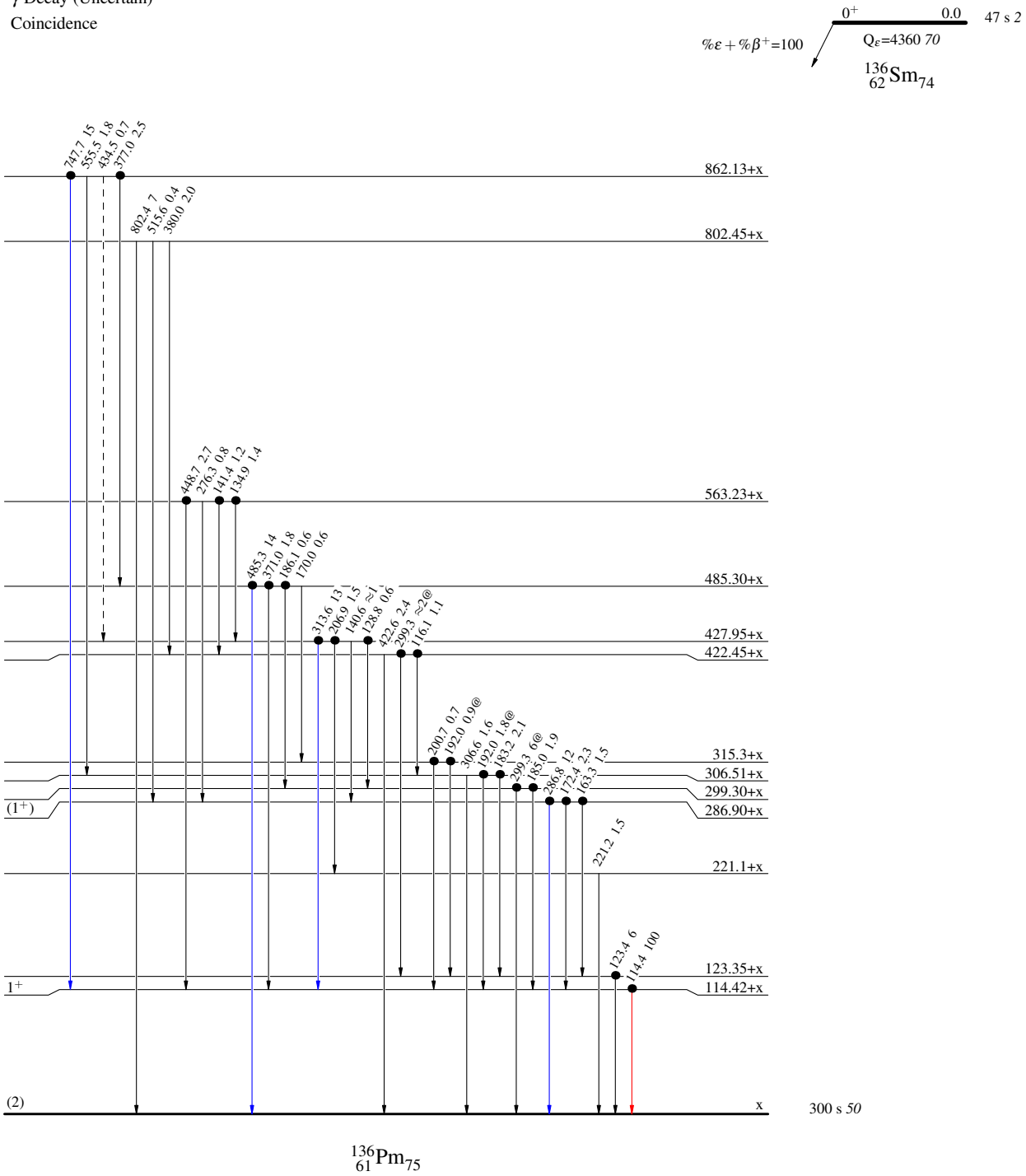
Decay Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

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



$^{136}_{61}Pm_{75}$