$^{147}_{60}$Nd $_{87}$

1 Decay Scheme

Nd-147 disintegrates by beta minus emission to excited levels of Pm-147. If a transition to the ground state level exists, it is less than 0.15 %.
Le néodyme 147 se désintègre par émission bêta moins vers des niveaux excités du prométhéum 147. La désintégration par émission bêta moins vers le niveau fondamental, si elle existe, est inférieure à 0,15 %.

2 Nuclear Data

$T_{1/2}$(^{147}Nd)	:	10,987	(11)	d
$T_{1/2}$(^{147}Pm)	:	2,6234	(4)	a
Q^-(^{147}Nd)	:	895,7	(9)	keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,10}$	209,8 (9)	2,184 (16)	1st Forbidden	7
$\beta^-_{0,9}$	215,3 (9)	0,0897 (28)	1st Forbidden	8,4
$\beta^-_{0,8}$	246,7 (9)	0,296 (19)	Unique 2nd Forbidden	7,5
$\beta^-_{0,6}$	262,8 (9)	0,0190 (27)	Unique 1st Forbidden	9,1
$\beta^-_{0,5}$	364,7 (9)	14,6 (9)	1st Forbidden	7
$\beta^-_{0,4}$	406,4 (9)	0,781 (15)	1st Forbidden	8,4
$\beta^-_{0,3}$	485,2 (9)	0,715 (34)	1st Forbidden	8,7
$\beta^-_{0,1}$	804,6 (9)	81 (5)	1st Forbidden	7,4
$\beta^-_{0,0}$	895,7 (9)	0 (5)	1st Forbidden	7,5

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{9,8}$(Pm)	31,3 (2)		[M2]		422 (14)	100 (4)	548 (18)
$\gamma_{10,8}$(Pm)	36,75 (10)		[E3]		7600 (170)	1960 (50)	10040 (220)
$\gamma_{10,6}$(Pm)	53,1 (2)		[E2]	4,40 (7)	16,1 (4)	3,73 (9)	25,1 (6)
$\gamma_{4,2}$(Pm)	80,82 (27)	0,0042 (11)	[M1,E2]	2,26 (17)	1,3 (10)	0,29 (22)	3,9 (11)
$\gamma_{1,0}$(Pm)	91,105 (2)	86 (5)	M1 + 0,80 % E2	1,714 (24)	0,250 (4)	0,0535 (8)	2,03 (3)
$\gamma_{8,5}$(Pm)	117,98 (8)	0,230 (19)	E3	3,15 (5)	8,41 (12)	2,02 (3)	14,07 (20)
$\gamma_{5,3}$(Pm)	120,48 (5)	0,690 (27)	M1 + 1,33 % E2	0,772 (11)	0,112 (4)	0,0239 (8)	0,914 (14)
$\gamma_{9,5}$(Pm)	149,3 (2)	0,0056 (6)	[M1,E2]	0,39 (3)	0,10 (5)	0,022 (10)	0,52 (3)
$\gamma_{10,5}$(Pm)	154,7 (2)	0,0058 (6)	[M1,E2]	0,36 (3)	0,09 (4)	0,020 (9)	0,468 (19)
$\gamma_{8,4}$(Pm)	159,7 (2)	0,0190 (14)	M2	2,18 (4)	0,439 (7)	0,0977 (15)	2,74 (4)
$\gamma_{9,4}$(Pm)	191,0 (3)	0,00442 (48)	[M1,E2]	0,192 (22)	0,040 (11)	0,009 (3)	0,244 (9)
$\gamma_{10,4}$(Pm)	196,64 (4)	0,2214 (23)	M1 + 3,85 % E2	0,196 (3)	0,0281 (8)	0,00601 (18)	0,231 (4)
$\gamma_{7,3}$(Pm)	230,77 (8)						
$\gamma_{8,2}$(Pm)	240,5 (2)	0,0417 (26)	E1	0,0213 (3)	0,00290 (5)	0,000615 (9)	0,0250 (4)
$\gamma_{9,2}$(Pm)	271,87 (6)	0,0138 (10)	M1 + 0,99 % E2	0,0820 (12)	0,01133 (16)	0,00242 (4)	0,0964 (14)
$\gamma_{10,3}$(Pm)	275,374 (15)	0,847 (13)	M1 + 1,23 % E2	0,0792 (11)	0,01095 (16)	0,00234 (4)	0,0931 (13)
$\gamma_{3,1}$(Pm)	319,411 (18)	2,112 (20)	M1 + 12,5 % E2	0,0514 (8)	0,00734 (11)	0,001572 (22)	0,0607 (9)
$\gamma_{4,1}$(Pm)	398,155 (20)	0,884 (8)	M1 + 8,1 % E2	0,0293 (5)	0,00406 (6)	0,000866 (13)	0,0345 (5)
$\gamma_{2,0}$(Pm)	408,52 (6)	0,0183 (13)	M1 + 24,5 % E2	0,0257 (5)	0,00368 (6)	0,000789 (12)	0,0304 (5)
$\gamma_{3,0}$(Pm)	410,48 (3)	0,140 (6)	E2	0,01724 (25)	0,00313 (5)	0,000683 (10)	0,0212 (3)
$\gamma_{5,1}$(Pm)	439,895 (22)	1,233 (12)	M1 + 27 % E2	0,0210 (4)	0,00300 (5)	0,000641 (10)	0,0248 (4)
$\gamma_{4,0}$(Pm)	489,24 (3)	0,138 (12)	M1 +38,4 % E2	0,0152 (16)	0,00218 (14)	0,00047 (3)	0,0179 (18)
$\gamma_{5,0}$(Pm)	531,016 (22)	12,9 (9)	M1 + 14,2 % E2	0,01374 (23)	0,00188 (3)	0,000402 (6)	0,0161 (3)
$\gamma_{6,1}$(Pm)	541,83 (7)	0,0190 (27)	[E2]	0,00824 (12)	0,001338 (19)	0,000290 (4)	0,00994 (14)
$\gamma_{9,1}$(Pm)	589,35 (4)	0,0374 (21)	[M1,E2]	0,0090 (23)	0,00128 (23)	0,00027 (4)	0,011 (3)
$\gamma_{10,1}$(Pm)	594,80 (3)	0,2684 (36)	M1 + 23,2 % E2	0,00995 (23)	0,00137 (3)	0,000292 (6)	0,0117 (3)
$\gamma_{8,0}$(Pm)	649,04 (8)	0,00510 (39)	M2	0,0251 (4)	0,00371 (6)	0,000799 (12)	0,0299 (5)
$\gamma_{9,0}$(Pm)	680,52 (15)	0,0285 (14)	[M1,E2]	0,0063 (18)	0,00088 (17)	0,00019 (4)	0,0074 (18)
$\gamma_{10,0}$(Pm)	685,90 (4)	0,841 (9)	M1 + 45,8 % E2	0,0063 (4)	0,00088 (4)	0,000188 (9)	0,0074 (5)

3 Atomic Data

3.1 Pm

ω_K	:	0,922	(4)
$\bar{\omega}_L$	:	0,148	(6)
n_{KL}	:	0,861	(4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	38,1716		55,1
	$K\alpha_1$	38,7251		100
	$K\beta_3$	43,713	}	
	$K\beta_1$	43,826	}	
	$K\beta_5''$	44,145	}	30,1
	$K\beta_2$	44,937	}	
	$K\beta_4$	45,064	}	8,4
	$KO_{2,3}$	45,162	}	
X_L				
	$L\ell$	4,81		
	$L\alpha$	5,4061 – 5,4325		
	$L\eta$	5,363		
	$L\beta$	5,9552 – 6,3985		
	$L\gamma$	6,6814 – 7,1893		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	30,16 – 32,08	100
KLX	36,03 – 37,63	49,6
KXY	41,84 – 44,16	7,1
Auger L	3,10 – 6,27	

4 Electron Emissions

		Energy keV		Electrons per 100 disint.
e_{AL}	(Pm)	3,10 - 6,27		43,4 (18)
e_{AK}	(Pm)			3,9 (4)
	KLL	30,16 - 32,08		}
	KLX	36,03 - 37,63		}
	KXY	41,84 - 44,16		}
$ec_{1,0\ K}$	(Pm)	45,921	(2)	48,7 (32)
$ec_{5,3\ K}$	(Pm)	75,30	(5)	0,279 (12)
$ec_{1,0\ L}$	(Pm)	83,677 - 84,646		7,10 (46)
$ec_{1,0\ M}$	(Pm)	89,460 - 90,078		1,52 (10)
$ec_{1,0\ N}$	(Pm)	90,774 - 91,101		0,342 (22)
$ec_{8,5\ L}$	(Pm)	110,52 - 111,49		0,128 (11)
$ec_{10,3\ K}$	(Pm)	230,190	(15)	0,0614 (12)
$ec_{3,1\ K}$	(Pm)	274,227	(18)	0,1023 (19)
$ec_{5,0\ K}$	(Pm)	485,832	(22)	0,163 (18)
$\beta^-_{0,10}$	max:	209,8	(9)	2,184 (16)
$\beta^-_{0,10}$	avg:	57,54	(27)	
$\beta^-_{0,9}$	max:	215,3	(9)	0,0897 (28)
$\beta^-_{0,9}$	avg:	59,16	(27)	
$\beta^-_{0,8}$	max:	246,7	(9)	0,296 (19)
$\beta^-_{0,8}$	avg:	91,35	(33)	
$\beta^-_{0,6}$	max:	262,8	(9)	0,0190 (27)
$\beta^-_{0,6}$	avg:	85,89	(33)	
$\beta^-_{0,5}$	max:	364,7	(9)	14,6 (9)
$\beta^-_{0,5}$	avg:	106,02	(30)	
$\beta^-_{0,4}$	max:	406,4	(9)	0,781 (15)
$\beta^-_{0,4}$	avg:	119,83	(30)	
$\beta^-_{0,3}$	max:	485,2	(9)	0,715 (34)
$\beta^-_{0,3}$	avg:	146,67	(30)	
$\beta^-_{0,1}$	max:	804,6	(9)	81 (5)
$\beta^-_{0,1}$	avg:	263,99	(35)	
$\beta^-_{0,0}$	max:	895,7	(9)	0 (5)
$\beta^-_{0,0}$	avg:	299,45	(35)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Pm)	4,81 — 7,1893		7,6 (3)	
XKα_2	(Pm)	38,1716		12,9 (9)	} Kα
XKα_1	(Pm)	38,7251		23,5 (15)	}
XKβ_3	(Pm)	43,713	}		
XKβ_1	(Pm)	43,826	}	7,3 (5)	K$'\beta_1$
XKβ_5''	(Pm)	44,145	}		
XKβ_2	(Pm)	44,937	}		
XKβ_4	(Pm)	45,064	}	1,87 (13)	K$'\beta_2$
XKO$_{2,3}$	(Pm)	45,162	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{4,2}$(Pm)	80,82 (27)	0,00086 (11)
$\gamma_{1,0}$(Pm)	91,105 (2)	28,4 (18)
$\gamma_{8,5}$(Pm)	117,98 (8)	0,0152 (13)
$\gamma_{5,3}$(Pm)	120,48 (5)	0,361 (14)
$\gamma_{9,5}$(Pm)	149,3 (2)	0,00368 (38)
$\gamma_{10,5}$(Pm)	154,7 (2)	0,00394 (38)
$\gamma_{8,4}$(Pm)	159,7 (2)	0,00508 (38)
$\gamma_{9,4}$(Pm)	191,0 (3)	0,00356 (38)
$\gamma_{10,4}$(Pm)	196,64 (4)	0,1798 (18)
$\gamma_{8,2}$(Pm)	240,5 (2)	0,0406 (25)
$\gamma_{9,2}$(Pm)	271,87 (6)	0,0126 (9)
$\gamma_{10,3}$(Pm)	275,374 (15)	0,775 (11)
$\gamma_{3,1}$(Pm)	319,411 (18)	1,991 (19)
$\gamma_{4,1}$(Pm)	398,155 (20)	0,855 (8)
$\gamma_{2,0}$(Pm)	408,52 (6)	0,0178 (13)
$\gamma_{3,0}$(Pm)	410,48 (3)	0,137 (6)
$\gamma_{5,1}$(Pm)	439,895 (22)	1,203 (11)
$\gamma_{4,0}$(Pm)	489,24 (3)	0,136 (11)
$\gamma_{5,0}$(Pm)	531,016 (22)	12,7 (9)
$\gamma_{6,1}$(Pm)	541,83 (7)	0,0188 (27)
$\gamma_{9,1}$(Pm)	589,35 (4)	0,037 (2)
$\gamma_{10,1}$(Pm)	594,80 (3)	0,2653 (36)
$\gamma_{8,0}$(Pm)	649,04 (8)	0,00495 (38)
$\gamma_{9,0}$(Pm)	680,52 (15)	0,0283 (14)
$\gamma_{10,0}$(Pm)	685,90 (4)	0,834 (9)

6 Main Production Modes

$\begin{cases} Nd - 146(n,\gamma)Nd - 147 \quad \sigma : 1,4\ (1)\ \text{barns} \\ \text{Possible impurities : none} \end{cases}$

Fission product.

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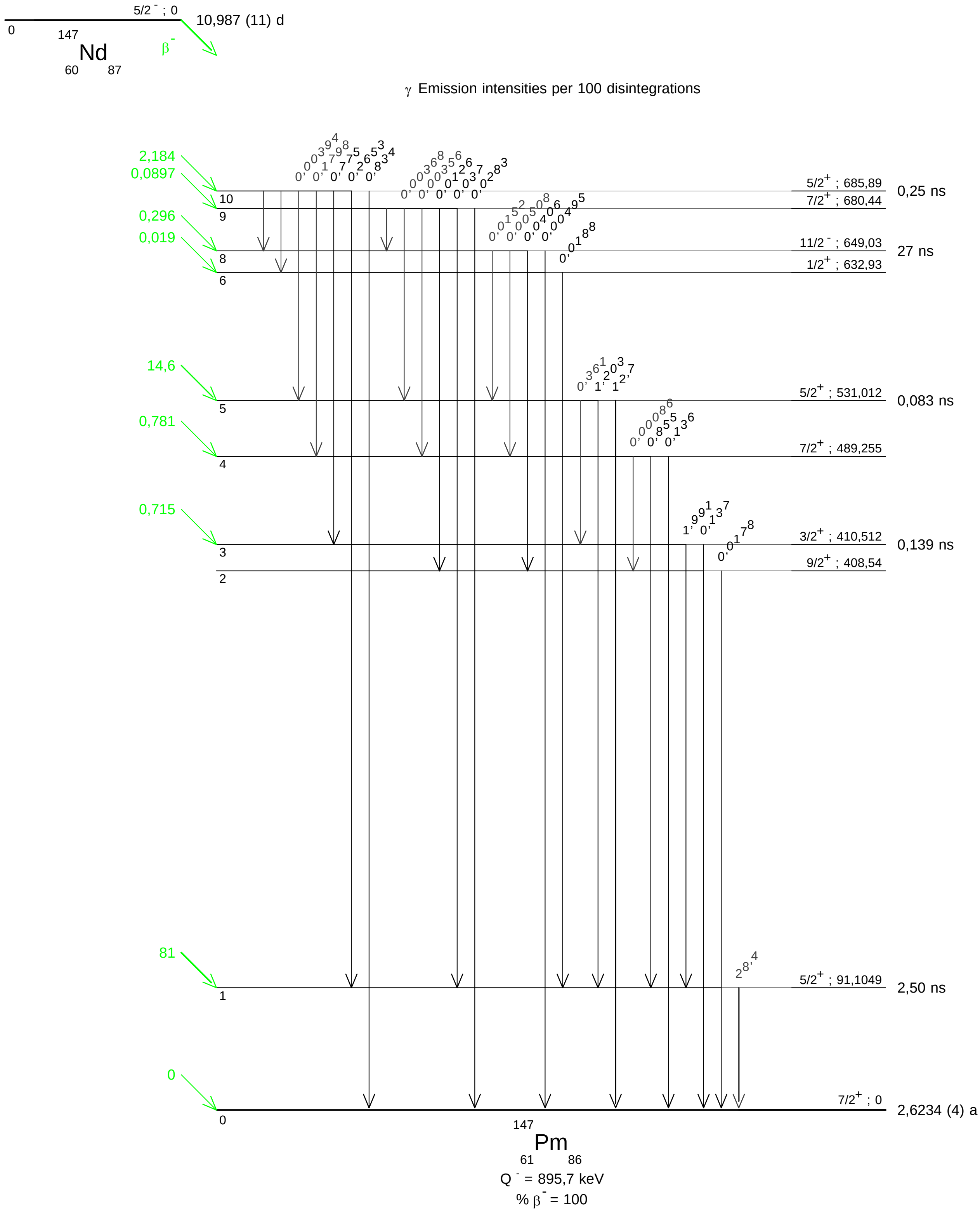
5/2 - ; 0
0
147 Nd 60 87
β-
10,987 (11) d
γ Emission intensities per 100 disintegrations
2,184
0,0897
0,296
0,019
14,6
0,781
0,715
81
0
5/2+ ; 685,89
7/2+ ; 680,44
11/2 - ; 649,03
1/2+ ; 632,93
5/2+ ; 531,012
7/2+ ; 489,255
3/2+ ; 410,512
9/2+ ; 408,54
5/2+ ; 91,1049
7/2+ ; 0
0,25 ns
27 ns
0,083 ns
0,139 ns
2,50 ns
2,6234 (4) a
147 Pm 61 86
Q - = 895,7 keV
% β - = 100