$^{237}_{92}\mathrm{U}_{145}$

1 Decay Scheme

U-237 decays by beta minus emission to levels in Np-237.
L'uranium 237 se désintègre par émission beta moins vers les niveaux du neptunium 237.

2 Nuclear Data

$T_{1/2}(^{237}\mathrm{U})$	:	6,749	(16)	d
$T_{1/2}(^{237}\mathrm{Np})$	:	2,144	(7)	10^6 a
$Q^-(^{237}\mathrm{U})$	:	518,6	(6)	keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,9}$	147,7 (6)	1,3 (9)	allowed	7,32
$\beta^-_{0,7}$	186,2 (6)	2,9 (9)	super-allowed	7,28
$\beta^-_{0,6}$	237,2 (6)	48,2 (25)	1st forbidden	6,39
$\beta^-_{0,5}$	251,1 (6)	40,9 (31)	1st forbidden	6,54
$\beta^-_{0,2}$	459,1 (6)	7 (4)	1st forbidden unique	8,1

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{9,8}$(Np)	2,3	0,232 (5)					
$\gamma_{6,5}$(Np)	13,81 (2)	48,8 (25)	M1+0,1%E2			364 (13)	492 (16)
$\gamma_{2,1}$(Np)	26,34463 (24)	22 (5)	E1		6 (2)	1,6 (2)	8 (2)
$\gamma_{4,3}$(Np)	27,020 (7)	0,7 (4)					

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}$(Np)	33,19629 (22)	23 (3)	M1+1,66%E2		131 (17)	33 (5)	175 (24)
$\gamma_{9,7}$(Np)	38,54 (3)	0,9 (9)	M1+15%E2		210 (160)	60 (50)	280 (210)
$\gamma_{3,1}$(Np)	42,704 (5)	0,65	M1+1,66%E2		56 (7)	13,9 (19)	75 (9)
$\gamma_{4,2}$(Np)	43,420 (3)	4,3 (7)	M1+16,8%E2		132 (17)	35 (5)	180 (23)
$\gamma_{7,6}$(Np)	51,01 (3)	0,596 (25)	E1		0,565 (12)	0,140 (3)	0,753 (15)
$\gamma_{2,0}$(Np)	59,54092 (10)	73,7 (31)	E1		0,84 (6)	0,226 (7)	1,16 (7)
$\gamma_{7,5}$(Np)	64,83 (2)	1,800 (26)	E1		0,301 (6)	0,0744 (15)	0,400 (8)
$\gamma_{4,1}$(Np)	69,76 (3)	0,0013 (3)	(E1)		0,248 (5)	0,0612 (12)	0,330 (7)
$\gamma_{3,0}$(Np)	75,899 (5)	0,05	(E2)		38,9 (8)	10,8 (2)	53,4 (11)
$\gamma_{4,0}$(Np)	102,959 (3)	0,0072 (10)	E1		0,0894 (18)	0,0219 (4)	0,119 (3)
$\gamma_{(-1,1)}$(Np)	114,09 (5)						
$\gamma_{5,4}$(Np)	164,61 (2)	5,02 (11)	E2	0,195 (4)	1,095 (20)	0,304 (6)	1,70 (4)
$\gamma_{5,2}$(Np)	208,00 (1)	84,8 (19)	M1+2,4%E2	2,35 (5)	0,473 (10)	0,115 (3)	2,98 (7)
$\gamma_{6,2}$(Np)	221,80 (4)	0,0316 (13)	E2	0,130 (3)	0,304 (6)	0,0839 (17)	0,547 (11)
$\gamma_{5,1}$(Np)	234,40 (4)	0,189 (8)	M2	5,560 (12)	1,95 (4)	0,511 (10)	8,24 (16)
$\gamma_{5,0}$(Np)	267,556 (12)	1,5 (4)	E1+19,4%M2	0,74 (4)	0,238 (12)	0,062 (3)	1,06 (6)
$\gamma_{8,3}$(Np)	292,77 (6)	0,0030 (9)	(E2)	0,0796 (16)	0,0991 (19)	0,0270 (6)	0,215 (4)
$\gamma_{8,2}$(Np)	309,1 (3)	0,00028	(E1)	0,0300 (6)	0,00585 (12)	0,00143 (3)	0,0377 (8)
$\gamma_{7,0}$(Np)	332,376 (16)	1,374 (19)	E2	0,0631 (12)	0,0611 (12)	0,0164 (4)	0,146 (3)
$\gamma_{8,1}$(Np)	335,38 (4)	0,162 (9)	M1+17,5%E2	0,54 (7)	0,113 (8)	0,0278 (17)	0,69 (8)
$\gamma_{9,1}$(Np)	337,7 (2)	0,0101 (6)	(E2)	0,0612 (12)	0,0575 (12)	0,0157 (3)	0,139 (3)
$\gamma_{(-1,2)}$(Np)	340,45	0,0016 (3)					
$\gamma_{8,0}$(Np)	368,602 (20)	0,0675 (28)	M1(+E2)	0,494 (10)	0,0963 (20)	0,0233 (5)	0,622 (13)
$\gamma_{9,0}$(Np)	370,928 (23)	0,167 (8)	M1+15,6%E2	0,42 (6)	0,086 (8)	0,0211 (17)	0,53 (7)

3 Atomic Data

3.1 Np

ω_K : 0,971 (4)
$\bar{\omega}_L$: 0,511 (20)
n_{KL} : 0,791 (5)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	97,069		62,82
	$K\alpha_1$	101,059		100
	$K\beta_3$	113,303	}	
	$K\beta_1$	114,234	}	
	$K\beta''_5$	114,912	}	36,45
	$K\beta_2$	117,476	}	
	$K\beta_4$	117,876	}	12,54
	$KO_{2,3}$	118,429	}	

		Energy keV	Relative probability
X_L			
	$L\ell$	11,89	
	$L\alpha$	13,76 – 13,94	
	$L\eta$	15,88	
	$L\beta$	16,13 – 17,99	
	$L\gamma$	20,12 – 22,2	

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	73,50 – 83,13	100
KLX	90,36 – 97,28	60,2
KXY	107,10 – 114,58	9,06
Auger L	5,04 – 13,52	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Np)	5,04 - 13,52	58,5 (21)
e_{AK}	(Np)		1,49 (21)
	KLL	73,50 - 83,13 }	
	KLX	90,36 - 97,28 }	
	KXY	107,10 - 114,58 }	
$ec_{2,1\ L}$	(Np)	3,918 - 8,731	14,6 (50)
$ec_{6,5\ M}$	(Np)	8,07 - 10,15	36,0 (19)
$ec_{1,0\ L}$	(Np)	10,769 - 15,586	17,0 (23)
$ec_{6,5\ N}$	(Np)	12,31 - 13,41	9,79 (43)
$ec_{9,7\ L}$	(Np)	16,11 - 20,93	0,7 (7)
$ec_{3,1\ L}$	(Np)	20,277 - 25,094	0,47
$ec_{2,1\ M}$	(Np)	20,606 - 22,681	3,9 (5)
$ec_{4,2\ L}$	(Np)	20,996 - 25,813	3,2 (5)
$ec_{1,0\ M}$	(Np)	27,457 - 29,532	4,3 (7)
$ec_{7,6\ L}$	(Np)	28,58 - 33,40	0,19 (8)
$ec_{1,0\ N}$	(Np)	31,695 - 32,793	1,16 (17)

		Energy keV	Electrons per 100 disint.
$ec_{9,7\ M}$	(Np)	32,80 - 34,88	0,2 (2)
$ec_{3,1\ M}$	(Np)	36,965 - 39,040	0,12
$ec_{9,7\ N}$	(Np)	37,04 - 38,14	0,05 (5)
$ec_{2,0\ L}$	(Np)	37,114 - 41,931	28,6 (22)
$ec_{4,2\ M}$	(Np)	37,684 - 39,759	0,84 (14)
$ec_{4,2\ N}$	(Np)	41,92 - 43,02	0,233 (37)
$ec_{7,5\ L}$	(Np)	42,40 - 47,22	0,387 (9)
$ec_{5,4\ K}$	(Np)	45,94 (2)	0,363 (9)
$ec_{2,0\ M}$	(Np)	53,802 - 55,877	7,7 (3)
$ec_{2,0\ N}$	(Np)	58,040 - 59,138	0,846 (24)
$ec_{7,5\ M}$	(Np)	59,09 - 61,17	0,096 (2)
$ec_{5,2\ K}$	(Np)	89,331 (10)	50,1 (13)
$ec_{5,1\ K}$	(Np)	115,73 (4)	0,114 (5)
$ec_{5,4\ L}$	(Np)	142,18 - 147,00	2,04 (5)
$ec_{5,0\ K}$	(Np)	148,87 (4)	0,53 (3)
$ec_{5,4\ M}$	(Np)	158,87 - 160,95	0,565 (14)
$ec_{5,4\ N}$	(Np)	163,11 - 164,21	0,1546 (33)
$ec_{5,2\ L}$	(Np)	185,573 - 190,390	10,1 (3)
$ec_{5,2\ M}$	(Np)	202,261 - 204,336	2,45 (7)
$ec_{5,2\ N}$	(Np)	206,499 - 207,597	0,662 (14)
$ec_{7,0\ K}$	(Np)	213,69 (4)	0,0757 (18)
$ec_{8,1\ K}$	(Np)	216,71 (4)	0,052 (7)
$ec_{5,0\ L}$	(Np)	245,11 - 249,93	0,172 (9)
$ec_{7,0\ L}$	(Np)	309,93 - 314,75	0,0733 (17)
$\beta^-_{0,9}$	max:	147,7 (6)	1,3 (9)
$\beta^-_{0,9}$	avg:	39,0 (2)	
$\beta^-_{0,7}$	max:	186,2 (6)	2,9 (9)
$\beta^-_{0,7}$	avg:	49,8 (2)	
$\beta^-_{0,6}$	max:	237,2 (6)	48,2 (25)
$\beta^-_{0,6}$	avg:	64,5 (2)	
$\beta^-_{0,5}$	max:	251,1 (6)	40,9 (31)
$\beta^-_{0,5}$	avg:	68,6 (2)	
$\beta^-_{0,2}$	max:	459,1 (6)	7 (4)
$\beta^-_{0,2}$	avg:	137,6 (2)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Np)	11,89 — 22,2		59,0 (21)	
XKα_2	(Np)	97,069		14,8 (4)	} Kα
XKα_1	(Np)	101,059		23,5 (6)	}
XKβ_3	(Np)	113,303	}		
XKβ_1	(Np)	114,234	}	8,57 (27)	K$'\beta_1$
XKβ''_5	(Np)	114,912	}		
XKβ_2	(Np)	117,476	}		
XKβ_4	(Np)	117,876	}	2,95 (10)	K$'\beta_2$
XKO$_{2,3}$	(Np)	118,429	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{6,5}$(Np)	13,81 (2)	0,099 (4)
$\gamma_{2,1}$(Np)	26,34463 (24)	2,43 (6)
$\gamma_{1,0}$(Np)	33,19629 (22)	0,130 (5)
$\gamma_{9,7}$(Np)	38,54 (3)	0,0033 (20)
$\gamma_{3,1}$(Np)	42,704 (5)	0,0085
$\gamma_{4,2}$(Np)	43,420 (3)	0,024 (2)
$\gamma_{7,6}$(Np)	51,01 (3)	0,340 (14)
$\gamma_{2,0}$(Np)	59,54091 (10)	34,1 (9)
$\gamma_{7,5}$(Np)	64,83 (2)	1,286 (17)
$\gamma_{4,1}$(Np)	69,76 (3)	0,00095 (19)
$\gamma_{3,0}$(Np)	75,899 (5)	0,00091
$\gamma_{4,0}$(Np)	102,959 (3)	0,0064 (9)
$\gamma_{5,4}$(Np)	164,61 (2)	1,86 (3)
$\gamma_{5,2}$(Np)	208,00 (1)	21,3 (3)
$\gamma_{6,2}$(Np)	221,80 (4)	0,0204 (8)
$\gamma_{5,1}$(Np)	234,40 (4)	0,0205 (8)
$\gamma_{5,0}$(Np)	267,556 (12)	0,721 (10)
$\gamma_{8,3}$(Np)	292,77 (6)	0,0025 (7)
$\gamma_{8,2}$(Np)	309,1 (3)	0,00027
$\gamma_{7,0}$(Np)	332,376 (16)	1,199 (16)
$\gamma_{8,1}$(Np)	335,38 (4)	0,0958 (22)
$\gamma_{9,1}$(Np)	337,7 (2)	0,0089 (5)
$\gamma_{(-1,2)}$(Np)	340,45	0,0016 (3)
$\gamma_{8,0}$(Np)	368,602 (20)	0,0416 (17)
$\gamma_{9,0}$(Np)	370,928 (23)	0,109 (2)

6 Main Production Modes

$\begin{cases} U-236(n,\gamma)U-237 \\ \text{Possible impurities : } U-236, U-238 \end{cases}$

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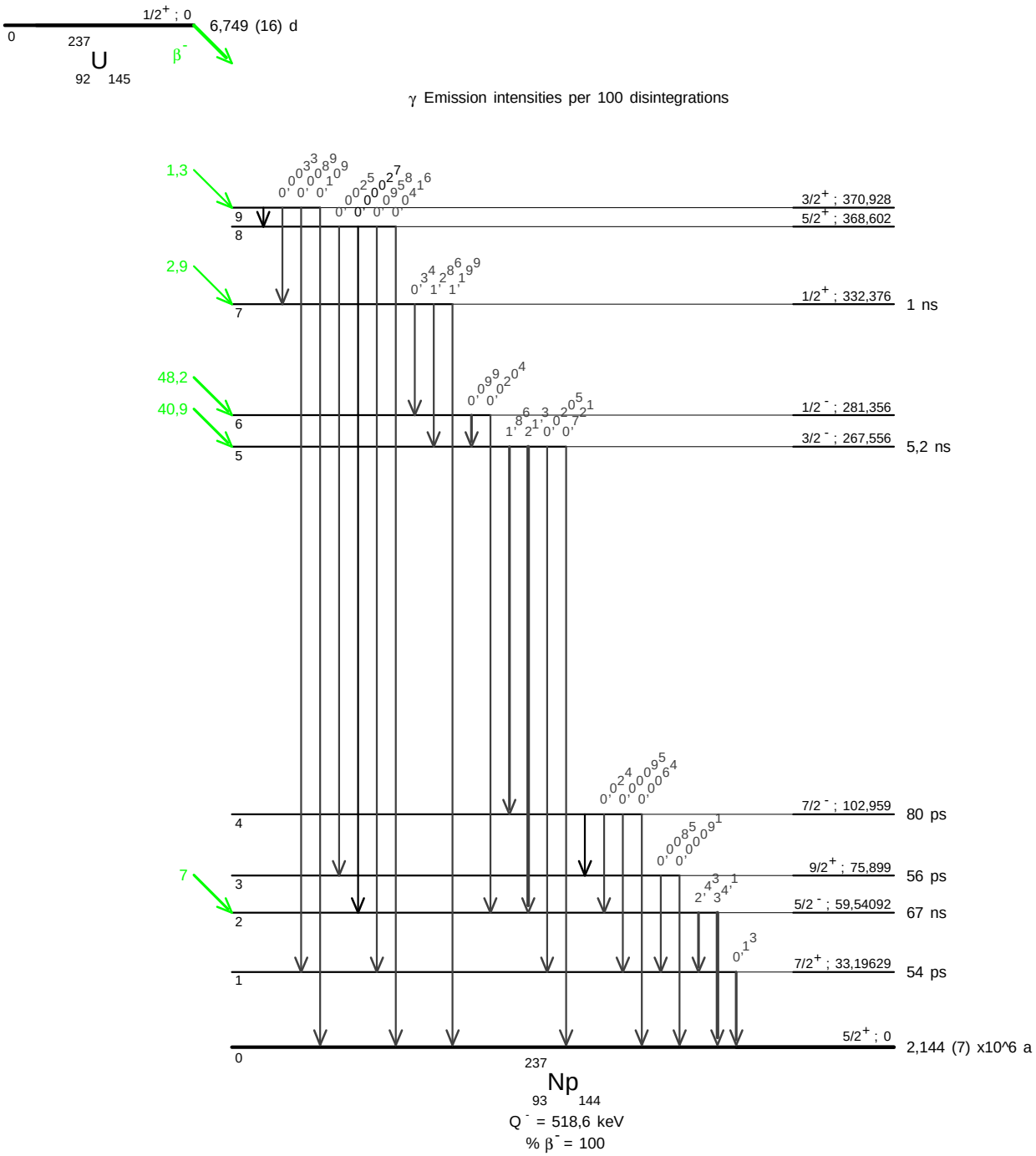
1/2+ ; 0
6,749 (16) d
β-
0
237
U
92 145
γ Emission intensities per 100 disintegrations
1,3
2,9
48,2
40,9
7
3/2+ ; 370,928
5/2+ ; 368,602
1/2+ ; 332,376
1 ns
1/2 - ; 281,356
3/2 - ; 267,556
5,2 ns
7/2 - ; 102,959
80 ps
9/2+ ; 75,899
56 ps
5/2 - ; 59,54092
67 ns
7/2+ ; 33,19629
54 ps
5/2+ ; 0
2,144 (7) x10^6 a
237
Np
93 144
Q - = 518,6 keV
% β- = 100