$^{155}_{63}$Eu $_{92}$

1 Decay Scheme

Eu-155 disintegrates 100 % via beta minus disintegration to excited levels and to the ground state in Gd-155.
L'europium 155 se désintègre par émission bêta moins vers des niveaux excités et le niveau fondamental de gadolinium 155.

2 Nuclear Data

$T_{1/2}$(^{155}Eu)	:	4,753	(14)	a
Q^-(^{155}Eu)	:	252,1	(11)	keV

2.1 β^- Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^-_{0,6}$	106,1 (11)	0,73 (7)	1st Forbidden	8,83
$\beta^-_{0,5}$	134,2 (11)	1,85 (23)	Allowed	8,75
$\beta^-_{0,4}$	144,6 (11)	<0,01	2nd Forbidden	>11,1
$\beta^-_{0,3}$	146,9 (11)	46,1 (29)	Allowed	7,47
$\beta^-_{0,2}$	165,7 (11)	25,5 (29)	Allowed	7,89
$\beta^-_{0,1}$	192,2 (11)	9,2 (4)	1st Forbidden	8,54
$\beta^-_{0,0}$	252,2 (11)	16,6 (11)	Allowed	8,65

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{5,4}$(Gd)	10,4183 (13)	1,2 (1)	M1+0,11%E2		265 (22)	59 (5)	340 (23)
$\gamma_{3,2}$(Gd)	18,763 (2)	17,7 (28)	M1+7,1%E2		284 (22)	65,9 (30)	367 (22)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{4,2}$(Gd)	21,035 (4)	1,2 (1)	E2		2013 (60)	471 (14)	2600 (70)
$\gamma_{2,1}$(Gd)	26,531 (21)	0,94 (7)	E1		1,55 (5)	0,342 (11)	1,98 (6)
$\gamma_{5,2}$(Gd)	31,444 (7)	0,50 (15)	M1+17%E2		53 (13)	12,5 (30)	69 (14)
$\gamma_{3,1}$(Gd)	45,299 (1)	1,89 (7)	E1		0,347 (10)	0,0758 (23)	0,443 (11)
$\gamma_{5,1}$(Gd)	57,989 (1)	0,150 (14)	E1	1,021 (10)	0,173 (5)	0,0377 (11)	1,243 (11)
$\gamma_{1,0}$(Gd)	60,0086 (10)	12,8 (6)	M1+4,1%E2	7,48 (9)	1,55 (6)	0,347 (14)	9,48 (11)
$\gamma_{6,1}$(Gd)	86,0591 (10)	0,65 (7)	M1+3,0%E2	2,66 (3)	0,443 (17)	0,098 (4)	3,23 (4)
$\gamma_{2,0}$(Gd)	86,5479 (10)	44,0 (5)	E1	0,360 (4)	0,0561 (17)	0,0122 (4)	0,432 (7)
$\gamma_{3,0}$(Gd)	105,3083 (10)	26,5 (8)	E1	0,214 (2)	0,0323 (10)	0,00701 (21)	0,255 (3)
$\gamma_{6,0}$(Gd)	146,071 (1)	0,084 (7)	E2	0,397 (4)	0,198 (6)	0,0462 (14)	0,653 (8)

3 Atomic Data

3.1 Gd

ω_K	:	0,932	(4)
$\bar{\omega}_L$	:	0,176	(6)
n_{KL}	:	0,850	(4)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	42,3093		55,59
	$K\alpha_1$	42,9967		100
	$K\beta_3$	48,556	}	
	$K\beta_1$	48,697	}	
	$K\beta_5''$	49,053	}	31,8
	$K\beta_2$	49,961	}	
	$K\beta_4$	50,099	}	8,1
	$KO_{2,3}$	50,219	}	
X_L				
	$L\ell$	5,36		
	$L\gamma$	– 8,35		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	33,49 – 35,75	100
KLX	39,98 – 42,86	51,3
KXY	47,98 – 48,95	6,58
Auger L	3,4 – 8,3	

4 Electron Emissions

		Energy keV		Electrons per 100 disint.
e_{AL}	(Gd)	3,4 - 8,3		35,1 (20)
e_{AK}	(Gd)			1,71 (11)
	KLL	33,49 - 35,75	}	
	KLX	39,98 - 42,86	}	
	KXY	47,98 - 48,95	}	
$ec_{5,4\ L}$	(Gd)	2,043 - 3,175		0,93 (13)
$ec_{5,1\ K}$	(Gd)	7,75 (3)		0,068 (7)
$ec_{5,4\ M}$	(Gd)	8,538 - 9,233		0,21 (3)
$ec_{1,0\ K}$	(Gd)	9,770 (3)		9,1 (4)
$ec_{3,2\ L}$	(Gd)	10,387 - 11,520		13,6 (23)
$ec_{4,2\ L}$	(Gd)	12,659 - 13,792		0,93 (18)
$ec_{3,2\ M}$	(Gd)	16,882 - 17,578		3,2 (5)
$ec_{2,1\ L}$	(Gd)	18,155 - 19,288		0,49 (4)
$ec_{4,2\ M}$	(Gd)	19,154 - 19,850		0,22 (4)
$ec_{5,2\ L}$	(Gd)	23,068 - 24,201		0,38 (4)
$ec_{2,1\ M}$	(Gd)	24,650 - 25,346		0,108 (8)
$ec_{5,2\ M}$	(Gd)	29,563 - 30,259		0,09 (3)
$ec_{6,1\ K}$	(Gd)	35,820 (3)		0,41 (5)
$ec_{2,0\ K}$	(Gd)	36,309 (3)		11,05 (16)
$ec_{3,1\ L}$	(Gd)	36,923 - 38,056		0,45 (2)
$ec_{3,1\ M}$	(Gd)	43,418 - 44,114		0,100 (5)
$ec_{5,1\ L}$	(Gd)	49,613 - 50,746		0,012 (1)
$ec_{1,0\ L}$	(Gd)	51,633 - 52,766		1,89 (11)
$ec_{3,0\ K}$	(Gd)	55,069 (3)		4,52 (14)
$ec_{5,1\ M}$	(Gd)	56,108 - 56,804		0,0030 (3)
$ec_{1,0\ M}$	(Gd)	58,128 - 58,823		0,42 (3)
$ec_{6,1\ L}$	(Gd)	77,683 - 78,816		0,068 (8)
$ec_{2,0\ L}$	(Gd)	78,172 - 79,305		1,72 (5)
$ec_{6,1\ M}$	(Gd)	84,178 - 84,874		0,015 (2)
$ec_{2,0\ M}$	(Gd)	84,667 - 85,363		0,375 (13)

		Energy keV		Electrons per 100 disint.
$ec_{6,0\ K}$	(Gd)	95,832	(3)	0,0202 (16)
$ec_{3,0\ L}$	(Gd)	96,933 - 98,066		0,68 (3)
$ec_{3,0\ M}$	(Gd)	103,428 - 104,123		0,148 (8)
$ec_{6,0\ L}$	(Gd)	137,696 - 138,829		0,0101 (8)
$ec_{6,0\ M}$	(Gd)	144,190 - 144,886		0,0024 (2)
$\beta^-_{0,6}$	max:	106,1	(11)	0,73 (7)
$\beta^-_{0,6}$	avg:	27,8	(3)	
$\beta^-_{0,5}$	max:	134,2	(11)	1,85 (23)
$\beta^-_{0,5}$	avg:	35,6	(3)	
$\beta^-_{0,4}$	max:	144,6	(11)	0,01
$\beta^-_{0,4}$	avg:			
$\beta^-_{0,3}$	max:	146,9	(11)	46,1 (29)
$\beta^-_{0,3}$	avg:	39,2	(3)	
$\beta^-_{0,2}$	max:	165,7	(11)	25,5 (29)
$\beta^-_{0,2}$	avg:	44,6	(3)	
$\beta^-_{0,1}$	max:	192,2	(11)	9,2 (4)
$\beta^-_{0,1}$	avg:	52,3	(3)	
$\beta^-_{0,0}$	max:	252,2	(11)	16,6 (11)
$\beta^-_{0,0}$	avg:	70,2	(3)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Gd)	5,36 — 8,35		7,5 (5)	
XKα_2	(Gd)	42,3093		6,70 (13)	} Kα
XKα_1	(Gd)	42,9967		12,05 (23)	}
XKβ_3	(Gd)	48,556	}		
XKβ_1	(Gd)	48,697	}	3,84 (11)	K$'\beta_1$
XKβ_5''	(Gd)	49,053	}		
XKβ_2	(Gd)	49,961	}		
XKβ_4	(Gd)	50,099	}	0,977 (26)	K$'\beta_2$
XKO$_{2,3}$	(Gd)	50,219	}		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{5,4}$(Gd)	10,4183 (13)	0,0035 (4)
$\gamma_{3,2}$(Gd)	18,763 (2)	0,048 (7)
$\gamma_{4,2}$(Gd)	21,035 (4)	0,00046 (3)
$\gamma_{2,1}$(Gd)	26,531 (21)	0,316 (22)
$\gamma_{5,2}$(Gd)	31,444 (7)	0,0071 (15)
$\gamma_{3,1}$(Gd)	45,299 (1)	1,31 (5)
$\gamma_{5,1}$(Gd)	57,989 (1)	0,067 (6)
$\gamma_{1,0}$(Gd)	60,0086 (10)	1,22 (5)
$\gamma_{6,1}$(Gd)	86,0591 (10)	0,154 (17)
$\gamma_{2,0}$(Gd)	86,5479 (10)	30,7 (3)
$\gamma_{3,0}$(Gd)	105,3083 (10)	21,1 (6)
$\gamma_{6,0}$(Gd)	146,071 (1)	0,051 (4)

6 Main Production Modes

$\begin{cases} \text{Sm} - 154(\text{n},\gamma)\text{Sm} - 155 \\ \text{Possible impurities : Eu} - 152, \text{Eu} - 154 \end{cases}$

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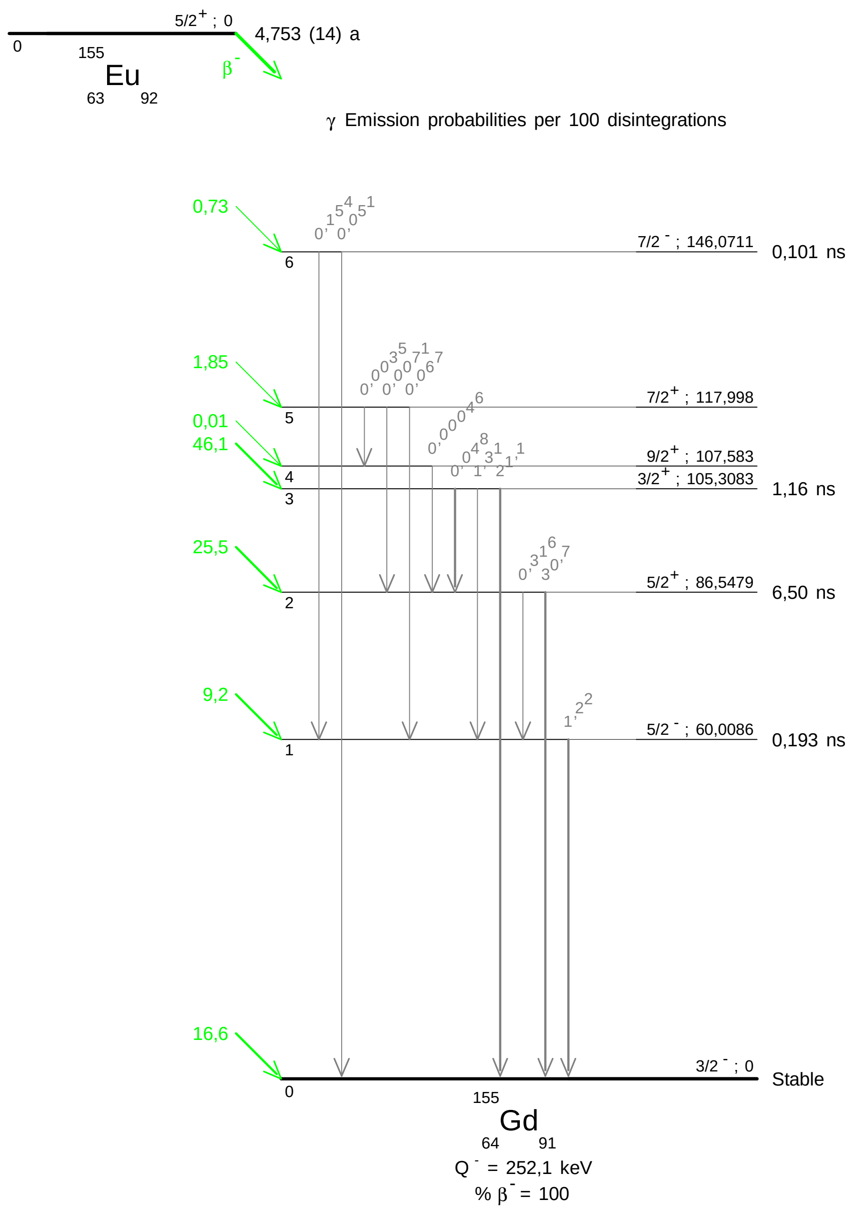
5/2+ ; 0
4,753 (14) a
155 Eu 63 92
β-
γ Emission probabilities per 100 disintegrations
0,73
1,85
0,01
46,1
25,5
9,2
16,6
7/2 - ; 146,0711
0,101 ns
7/2+ ; 117,998
9/2+ ; 107,583
3/2+ ; 105,3083
1,16 ns
5/2+ ; 86,5479
6,50 ns
5/2 - ; 60,0086
0,193 ns
3/2 - ; 0
Stable
155 Gd 64 91
Q - = 252,1 keV
% β- = 100