$^{151}_{62}\mathrm{Sm}_{89}$

1 Decay Scheme

^{151}Sm disintegrates by beta minus emission mainly to the ground state of ^{151}Eu. The internal ionisation probability of the K shell following beta minus decay is P_K = 1,98 (23) $\times 10^{-4}$ %. The corresponding probability of the L shell is P_L = 30,8 (30) $\times 10^{-2}$ %.

Le ^{151}Sm *se désintègre par émission bêta moins principalement vers le niveau fondamental du* ^{151}Eu. *La probabilité d'ionisation interne de la couche K lors la désintégration est de* P_K = 1,98 (23) $\times 10^{-4}$ %. *La probabilité d'ionisation interne de la couche L est de* P_L = 30,8 (30) $\times 10^{-2}$ %.

2 Nuclear Data

$T_{1/2}(^{151}\mathrm{Sm})$	:	94,7	(6)	a
$Q^-(^{151}\mathrm{Sm})$	:	76,43	(7)	keV

2.1 β^- Transitions

	Energy (keV)	Probability (%)	Nature	log ft
$\beta^-_{0,1}$	54,89 (7)	0,89 (4)	1$^{\mathrm{st}}$ Forbidden	9,22
$\beta^-_{0,0}$	76,43 (7)	99,11 (4)	1$^{\mathrm{st}}$ Forbidden	7,61

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_L	α_M	α_N	α_O	α_T
$\gamma_{1,0}$(Eu)	21,541 (3)	0,889 (46)	M1+0,085(5)%E2	21,7 (4)	4,71 (8)	1,074 (18)	0,168 (3)	27,6 (5)

3 Atomic Data

3.1 Eu

ω_K : 0,929 (4)
$\bar{\omega}_L$: 0,168 (7)
n_{KL} : 0,853 (4)

3.1.1 X Radiations

		Energy (keV)	Relative probability
X_L		5,1751 - 7,791	100
	Lℓ	5,1751	1,16
	Lα	5,815 - 5,8461	28,36
	Lη	5,8149	0,61
	Lβ	6,4365 - 6,9193	57,59
	Lγ	7,2538 - 7,791	12,76

3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger L	3,377 - 7,786	100

4 Electron Emissions

		Energy (keV)	Electrons (per 100 disint.)
e_{AL}	(Eu)	3,377 - 7,786	0,558 (21)
$ec_{1,0\ L}$	(Eu)	13,489 - 14,564	0,675 (35)
$ec_{1,0\ M}$	(Eu)	19,70 - 20,41	0,146 (7)
$\beta^-_{0,1}$	max: 54,89 (7) avg: 13,819 (18)		0,89 (4)
$\beta^-_{0,0}$	max: 76,43 (7) avg: 19,453 (19)		99,11 (4)

5 Photon Emissions

5.1 X-Ray Emissions

	Energy (keV)	Photons (per 100 disint.)
X_L (Eu)	5,1751 - 7,791	0,116 (4)

5.2 Gamma Emission

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{1,0}$(Eu)	21,541 (3)	0,0311 (15)

6 Main Production Modes

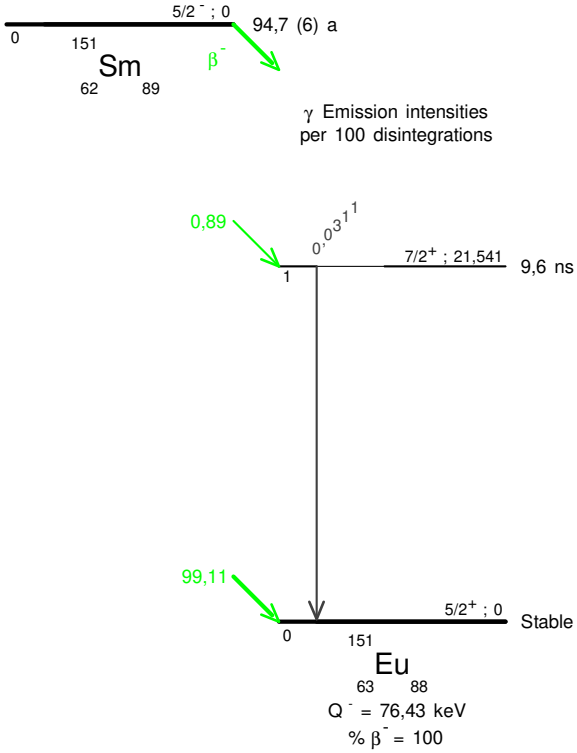
{ Fission product
{ Possible impurities: ^{153}Sm

{ ^{149}Sm(n,γ)^{151}Sm σ : 104 (5) barns
{ Possible impurities: ^{153}Sm

7 References

- M.G.Inghram, R.J.Hayden, D.C.Hess. Phys. Rev. 79 (1950) 271
  (Half-life)
- D.G.Karraker, R.J.Hayden, M.G.Inghram. Phys. Rev. 87 (1952) 901
  (Half-life)
- W.C.Rutledge, J.M.Cork, S.B.Burson. Phys. Rev. 86 (1952) 775
  (Half-life)
- E.A.Melaika, M.J.Parker, J.A.Petruska, R.H.Tomlinson. Can. J. Chem. 33 (1955) 830
  (Half-life)
- W.T.Achor, W.E.Phillips, J.I.Hopkins, S.K.Haynes. Phys. Rev. 114 (1959) 137
  (Ib, ICC)
- K.F.Flynn, L.E.Glendenin, E.P.Steinberg. Nucl. Sci. Eng. 22 (1965) 416
  (Half-life)
- M.P.Avotina, E.P.Grigorev, A.V.Zolotavin, V.O.Sergeev, J.Vrzal, J.Liptak, N.A.Lebedev, Y.Urbanets. Bull. Acad. Sci. USSR, Phys. Ser. 30 (1966) 1362
  (Mixing ratio)
- S.A.Reynolds, J.F.Emery, E.I.Wyatt. Nucl. Sci. Eng. 32 (1968) 46
  (Half-life)
- E.P.Grigorev, A.V.Zolotavin, V.O.Sergeev, M.I.Sovtsov, J.Vrzal, N.A.Lebedev, J.Liptak, J.Urbanets, P.P.Dmitriev, N.N.Krasnov, Y.G.Sevastyanov. Bull. Acad. Sci. USSR, Phys. Ser. 32 (1969) 723
  (Mixing ratio, ICC)
- S.Antman, H.Pettersson, Z.Zehlev, I.Adam. Z. Phys. 237 (1970) 285
  (Mixing Ratio)
- J.W.Ford, A.V.Ramayya, J.J.Pinajian. Nucl. Phys. A146 (1970) 397
  (ICC)
- J.L.Campbell, L.A.McNelles, J.Law. Can. J. Phys. 49 (1971) 3142
  (X-ray emission probabilities Gamma-ray emission probabilities)

- M.S.Freedman, D.A.Beery. Phys. Rev. Lett. 34 (1975) 406
  (Gamma-ray emission probabilities)
- J.Law, J.L.Campbell. Phys. Rev. C12 (1975) 984
  (Internal ionisation)
- V.R.Veluri, P.Venugopala Rao. Z. Physik A280 (1977) 317
  (ICC)
- C.E.Laird, Parl C.Hummel, Hsing-Chung Liu. Phys. Rev. C21 (1980) 723
  (Gamma-ray emission probabilities PK)
- K.P.Artamonova, N.B.Grachev, E.P.Grigorev, A.V.Zolotavin, V.O.Sergeev. Bull. Acad. Sci. USSR, Ser. Phys. 45,1 (1981) 93
  (Mixing ratio)
- I.J.Unus, P.A.Indira, P.Venugopala Rao. J. Phys. (London) G7 (1981) 1683
  (X-ray emission probabilities L X-ray emission probabilities PK PL)
- E.Schönfeld, H.Janssen. Appl. Radiat. Isotopes 52 (2000) 595
  (Atomic)
- T.Kibédi, T.W.Burrows, M.B.Trzhaskovskaya, P.M.Davidson, C.W.Nestor Jr. Nucl. Instrum. Methods Phys. Res. A589 (2008) 202
  (Theoretical ICCs)
- B.Singh. Nucl. Data Sheets 110 (2009) 1
  (Evaluation)
- Ming He, G.Shi, X.Yin, W.Tian, S.Jiang. Phys. Rev. C80 (2009) 064305
  (Half-life)
- H.Shen, et al. Phys. Rev. C 84 (2011) 054307
  (Gamma-ray emission probability)
- X.Mougeot, C.Bisch. Phys. Rev. A 90 (2014) 012501
  (BetaShape)
- M.M.Bé, et al. RadioChimica Acta 103 (2015) 619
  (Half-life)
- M.M.Bé, et al. Monographie BIPM-5 8 (2016)
  (Evaluation)
- X.Mougeot. Appl. Radiat. Isotopes 154 (2019) 108884
  (BetaShape)
- M.Wang, et al. Chin. Phys. C 45 (2021) 030003
  (Q)
- K.Kossert, et al. Appl. Radiat. Isotopes 185 (2022) 110237
  (Q, branching ratios)


5/2⁻ ; 0
94,7 (6) a
0
151
Sm
62
89
β⁻
γ Emission intensities
per 100 disintegrations
0,89
0,03
1
0'
7/2⁺ ; 21,541
9,6 ns
1
99,11
5/2⁺ ; 0
Stable
0
151
Eu
63
88
Q⁻ = 76,43 keV
% β⁻ = 100