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RADIATION AND DECAY CHARACTERISTICS OF LONG-LIVED RADIONUCLIDES USED IN THE NATIONAL ECONOMY AND SCIENTIFIC RESEARCH

(Evaluated Data)

A Handbook

(USSR Ministry of Atomic Energy and Industry)

V.P. Chechev, F.E. Chukreev

Translated by the IAEA

October 1991

IAEA NUCLEAR DATA SECTION, WAGRAMERSTRASSE 5, A-1400 VIENNA

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ABSTRACT

This handbook contains new evaluated data for a series of radionuclides distributed by the All-Union Organization "Izotop". It is intended for use by the wide range of scientists and engineers using these isotopes in their work.

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PREFACE

In recent years, in response to the urgent need to ensure the safe use of atomic energy, requirements have been getting stricter not only with respect to equipment reliability but also as regards the accuracy of the values assigned to various radiation characteristics and the associated nuclear constants. This includes the nuclear decay characteristics of radioactive nuclides used in scientific research and in the national economy.

Given the copious quantities of experimental information available on the characteristics of atomic nuclei, highly reliable values for nuclear physics characteristics can be obtained only by evaluating all the experimental data, and this involves selection, critical analysis, statistical processing, and checking that the values do not contradict one another. Evaluated data produced in this way can be recommended for use for a specific but definitely limited period of time, since their quality and reliability depends so much on the experimental and theoretical data from which they are derived being complete and relatively new.

Thus, when we are using one or another group of radionuclides in practical work, it is important to have equally "fresh" evaluated data for them, and to revise previously published evaluated nuclear physics data regularly to take account of the latest information.

In compiling this handbook we set this as our goal. The book gives tables of evaluated data on radiation and decay characteristics for a large group of long-lived nuclides (with half-lives of over 200 days).

Decay data and data on accompanying radiation emissions are given for the following nuclides:

^{3}H, ^{14}C, ^{22}Na, ^{36}Cl, ^{49}V, ^{54}Mn, ^{55}Fe, ^{57}Co, ^{60}Co, ^{63}Ni, ^{65}Zn, ^{85}Kr, ^{90}Sr, ^{90}Y, ^{99}Tc, ^{106}Ru, ^{106}Rh, ^{109}Cd, $^{110}Ag^{m}$, ^{125}Sb, $^{125}Te^{m}$, ^{129}I, ^{134}Cs, ^{137}Cs, ^{133}Ba, ^{144}Ce, ^{144}Pr, ^{147}Pm, ^{152}Eu, ^{154}Eu, ^{153}Gd, $^{166}Ho^{m}$, ^{204}Tl, ^{207}Bi.

Radioactive preparations containing these long-lived nuclides are manufactured and distributed by the All-Union Organization "Izotop". Only the transactinide nuclides have not been included since relatively recent information for these is already available and the data in Refs [1] and [2]

are not yet out of date. The above list does include some nuclides (^{90}Y, ^{106}Rh, ^{125}Te^{m}, ^{144}Pr) with half-lives shorter than the selected period of 200 days in order to take daughter product activity in the sources into account.

The tables of evaluated values in this book take into account all the information published in physics literature throughout the world up until 1990. We have used two types of evaluated data which take account of the above-mentioned information and which were obtained by techniques found to be equally reliable in tests performed by the State Standardized Reference Data Service (GSSSD).

The first of these relates to work performed within the framework of international co-operation among various data centres and groups organized by the IAEA, a project under which the whole volume of data on the structure of nuclei and their transformations is to be evaluated. The results of this work are in the ENSDF data library [3] and are being published partially in the journals Nuclear Data Sheets (the name of which has now been changed to Journal of Nuclear Data) and Nuclear Physics.

Thus, evaluated data on radioactive processes are obtained not only via critical analysis of experimental data on the emissions accompanying radioactive decay, but also on the basis of all available information on the energy level characteristics of parent and daughter nuclei. In the USSR, the following institutes are involved in this type of work: the Data Centre on the Structure of the Atomic Nucleus and Nuclear Reactions (TsAYaD), the Ministry of Atomic Energy and Industry (I.V. Kurchatov Institute of Atomic Energy), and the Data Centre of the B.P. Konstantinov Leningrad Institute of Nuclear Physics of the USSR Academy of Sciences (TsD LIYaF).

This book contains evaluated data prepared in the TsAYaD by E.N. Shurshikov (^{3}H and ^{166}Ho^{m}) and in the TsD LIYaF by Yu.V. Sergeenkov (^{133}Ba and ^{134}Cs).

The evaluated data for the remaining radionuclides were obtained by processing experimental data on nuclear physics characteristics directly related to the radioactive decay of the nuclide of interest. These data constitute a revision of the evaluated values given in the collections of recommended data published in 1980 and 1982 [4, 5].

Our evaluated data were refined and corrected in the V.G. Khlopin Radium Institute in collaboration with physicists from the Leningrad State University. The book contains revised evaluated data produced by

Sh.V. Kamynov, N.K. Kuz'menko, M.A. Mikhajlova, Yu.V. Khol'nov, V.P. Chechev (V.G. Khlopin Radium Institute) and V.O. Sergeev (Leningrad State University).

We decided to limit the number of references to the absolute minimum - i.e. references are made only to publications containing evaluation methods and tables from which numbers were taken to calculate certain data [1-13]. This decision to refrain from listing all publications whose experimental results were taken into account in preparing the evaluated data was prompted by the fact that our book is intended more for the research worker than for the nuclear physics specialist.

If the reader wishes to acquaint himself with the evaluation methods used, he will find all the information he requires in any issue of the journal Nuclear Data Sheets, or in Ref. [4] which has already been cited. Should any reader wish to determine the "origin" of any particular number in this book, we would be pleased to be of assistance to him.

We hope to continue with our work on the systematization of evaluated data for a wider range of radionuclides in practical use.

List of abbreviations

$T_{1/2}$ - half-life of the radionuclide;

Q_{β^-}, Q_{β^+}, Q_{ε}, Q_{it} - total decay energy. The index indicates the type of radioactive transformation: β^-, β^+ decay, ε - electron capture from the electron shell (E-capture), and it - isomeric transition;

E_{α}, E_{β}, E_{γ}, E_{x}, E_{e}, E_{A} - energies of the components which are, respectively, α-, β-, γ-, characteristic X-ray, conversion radiation, and Auger electrons;

I'_{α}, I'_{β}, I'_{γ}, I'_{x}, I'_{e}, I'_{A} - relative intensities of the radiation components;

I_{α}, I_{β}, I_{γ}, I_{x}, I_{e}, I_{A} - absolute intensities of the radiation components expressed as a percentage of the decay of the relevant radionuclide;

α_{K}, α_{L}, α_{M}, α_{N} - coefficients of internal conversion for various electron shells;

α_{Π} - total internal conversion coefficient;

σL - multipolarity of transition;

Σ^{I} - total absolute intensities (summations) for the relevant types of radiation;

$\langle E_{(\alpha,\ \beta,\ \gamma,\ x,\ e,\ \gamma + x)} \rangle$ - mean energy of the radiation (per particle or quantum);

$\langle\langle E_{(\alpha,\ \beta,\ \gamma,\ x,\ e,\ \gamma + x)} \rangle\rangle$ - mean energy of the radiation per decay event;

Γ_{γ} - ionization gamma-constant in non-coherent units, $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$;

Γ_{δ} - kerma-constant in $aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$ ($aGy = 10^{-18}$ Gr);

δ - set value for the threshold energy, in keV, assumed to be 30 for most radionuclides.

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$^{3}_{1}H_{2}$

β^-

$T_{1/2}$		12.36(5) a
Q_β		18.593(3) keV
E_β, keV	$\langle E_\beta \rangle$ keV	I_β, %
18.579(3)	5.69(2)	100
$\langle\langle E_\beta \rangle\rangle$		5.69(2) keV/decay

$^{14}_{6}C_{8}$

β^-

$T_{1/2}$		$5.73(4)\cdot10^{3}$ a
Q_β		156.473(9) keV
E_β, keV	$\langle E_\beta \rangle$ keV	I_β, %
156.473(9)	49.44(1)	100
$\langle\langle E_\beta \rangle\rangle$		49.44(1) keV/decay

$^{22}_{11}Na_{11}$

β^+, γ, X, e_A

$T_{1/2}$			2.603(2) a
Q_{β^+}			2842.0(5) keV
$Ic_L/I_{\beta_1^+}$	0.1057(11)	Ic_L/Ic_K	0.063(5)

β_i^+	$E_{\beta_i^+}$, keV	$\langle E_{\beta_i^+} \rangle$, keV	$I_{\beta_i^+}$, %
β_1	545.5(3)	215.1(2)	90.39(9)
β_2	1820.0(5)	834.9(2)	0.056(13)

$\langle E_{\beta^+} \rangle$ 215.5(2) keV
$\langle\langle E_{\beta^+} \rangle\rangle$ 194.9(2) keV/decay

γ_i	E_{γ_i}, keV	I_{γ_i}, %
γ_1	1274.543(5)	99.937(15)
$\gamma^{\pm}$	511.00	180.89(18)

$\langle E_\gamma \rangle$ 782.72(12) keV $\quad \Sigma I_\gamma$ 280.83(18) %
$\langle\langle E_\gamma \rangle\rangle$ 2198.1(14) keV/decay

Γ_γ 11.9(5) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$
$\Gamma_{\gamma\,\delta=30\ keV}$ 77.9(33) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

E_{XK}, keV	ΣI_{XK}, %
0.85	0.16(2)

e_i	E_{e_i}, keV	I_{e_i}, %
K	1273.673(5)	$6.8(1)\cdot10^{-4}$

$E_{e_{AK}}$, keV	$\Sigma I_{e_{AK}}$, %
0.75-0.81	8.5(3)

$^{36}_{17}Cl_{19}$

$\beta^-, \beta^+, \gamma^{\pm}, X, e_A$

$T_{1/2\beta}$	$3.07(2)\cdot10^5$ a
$T_{1/2}$	$3.01(2)\cdot10^5$ a
Q_ε	1142.29(25) keV
Q_{β^-}	709.2(3) keV
$I\varepsilon_K/I_{\beta^-}$	0.017(1)
$I\varepsilon_L/I\varepsilon_K$	0.112(8)
ΣI_ε	1.9(1) %

E_{β^-}, keV	$\langle E_{\beta^-}\rangle$, keV	I_{β^-}, %
709.2(3)	251.1(2)	98.1(1)

$\langle E_{\beta^-}\rangle$	246.3(2) keV

E_{β^+}, keV	I_{β^+}, %
120.3(3)	$1.5(1)\cdot10^{-3}$

$E_{\gamma^\pm}$, keV	$I_{\gamma^\pm}$, %
511.00	$3.0(2)\cdot10^{-3}$

X_{K_i}(S)	E_{XK_i}, keV	I_{XK_i}, %
K_α	2.307	0.123(20)
K_β	2.468	0.007(1)
ΣI_{XK_i}(S)		0.130(15) %

X_{K_i}(Ar)	E_{XK_i}, keV	IE_{XK_i}, %
K_α	2.957	0.018(4)
K_β	3.191	0.0018(4)
ΣI_{XK_i}(Ar)		0.020(4) %

e_{AK}	$E_{e_{AK}}$, keV	$I_{e_{AK}}$, %
KLL(S)	1.98-2.12	1.40(17)
KLX(S)	2.22-2.30	0.14(2)
KXY(S)	2.44-2.46	0.0018(3)
$\Sigma I_{e_{AK}}$(S)		1.54(10) %
KLL(Ar)	2.51-2.60	0.176(30)
KLX(Ar)	2.83-2.93	0.023(4)
LXY(Ar)	3.14-3.17	0.0010(2)
$\Sigma I_{e_{AK}}$(Ar)		0.20(3) %
$\Sigma I_{e_{AK}}$(S+Ar)		1.74(11) %

$^{49}_{23}V_{26}$

X, e_A

$T_{1/2}$			338(5) days
Q_ε			601.9(8) keV
$I_{\varepsilon_L}/I_{\varepsilon_K}$	0.106(4)	$I_{\varepsilon_{LMN}}/I_{\varepsilon_K}$	0.12(2)

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
$K_{\alpha 2}$	4.505	50.8(11)	5.8(6)
$K_{\alpha 1}$	4.511	100	11.4(12)
K_β	4.93	17.1(4)	1.9(2)

ΣI_{XK}	19.1(20)%	$\langle E_{XK}\rangle$	4.55(22) keV
$\langle\langle E_{XK}\rangle\rangle$	1.1(1) keV/decay		

e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$, %
KLL	3.80-4.01	100	58.4(17)
KLX	4.36-4.51	18.9(4)	11.0(3)
KXY	4.85-4.96	1.35(3)	0.79(3)

$\Sigma I_{e_{AK}}$	70.2(20)%	$\langle E_{e_{AK}}\rangle$	4.0(2) keV
$\langle\langle E_{e_{AK}}\rangle\rangle$	2.6(1) keV/decay		

$^{54}_{25}Mn_{29}$

γ, X, e, e_A

$T_{1/2}$	312.14(8) days
Q_ε	1377.1(10) keV

I_{ε_K}, %	I_{ε_L}, %	$I_{\varepsilon_{MN}}$, %
89.1(2)	9.4(2)	1.45(3)

E_γ, keV	I_γ, %
834.848(2)	99.9749(11)

Γ_γ	4.6(27)	$R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$
$\Gamma_{\delta=30}$	30.2(18)	$aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

X_{K_i}(Cr)	E_{XK_i} keV	I_{XK_i}, %
$K_{\alpha 2}$	5.405	7.7(3)
$K_{\alpha 1}$	5.415	15.3(6)
K_β	5.947	2.7(1)

ΣI_{XK}	25.7(3) %

$\langle E_{\gamma+XK}\rangle$	665.24(5)	keV
$\langle\langle E_{\gamma+XK}\rangle\rangle$	836.04(6)	keV/decay
$\Sigma I_{\gamma+XK}$	125.7(3)	%

E_{XL}, keV	I_{XL}, %
0.50-0.65	0.45(6)

α_K	α_n
$2.24(10)\cdot 10^{-4}$	$2.51(11)\cdot 10^{-4}$

e_i	E_{e_i}, keV	I'_{e_i}	I_{e_i}, %
K	828.859(2)	8.5(7)	0.022(1)
LM	834.15-834.84	1	0.0026(3)

e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$, %
KLL	4.54-4.79	100	51.4(13)
KLX	5.22-5.41	21.5(5)	11.1(3)
KXY	5.84-5.98	1.73(4)	0.89(2)

$\Sigma I_{e_{AK}}$	63.4(6)%

$E_{e_{AL}}$, keV	$I_{e_{AL}}$, %
0.4-0.7	149(8)

$^{55}_{26}Fe_{29}$

X, e_A

$T_{1/2}$	2.72(8) a
Q_ε	231.7(7) keV
$I_{\varepsilon_L}/I_{\varepsilon_K}$	0.117(1)
$I_{\varepsilon_M}/I_{\varepsilon_L}$	0.156(3)

X_{K_i}	E_{XK_i} keV	I'_{XK_i}	I_{XK_i},%
$K_{\alpha 2}$	5.887	51.0(10)	8.5(2)
$K_{\alpha 1}$	5.898	100	16.8(4)
K_β	6.490	18.0(4)	3.0(1)

ΣI_{XK} 28.3(3)% $\langle E_{XK}\rangle$ 5.96(3) keV

$\langle\langle E_{XK}\rangle\rangle$ 1.69(2) keV/decay

	E_{XL}, кэВ	ΣI_{XL}
	0.56-0.72	0.43(6)

e_{AK}	$E_{e_{AK}}$, кэВ	$I'_{e_{AK}}$	$I_{e_{AK}}$,%
KLL	4.95-5.21	100	48.5(10)
KLX	5.67-5.90	22.7(4)	11.0(2)
KXY	6.37-6.53	1.62(4)	0.92(2)

$\Sigma I_{e_{AK}}$ 60.5(4)% $\langle E_{e_{AK}}\rangle$ 5.2(3) кэВ

$\langle\langle E_{e_{AK}}\rangle\rangle$ 3.1(1) keV/decay

$^{57}_{27}Co_{30}$

$T_{1/2}$ 271.80(4) days

Q_ε 836.4(5) кэВ

γ_i	E_{γ_i}, кэВ	I'_{γ_i}	I_{γ_i},%
γ_1	14.4130(2)	11.2(2)	9.57(3)
γ_2	122.0613(3)	100	85.54(14)
γ_3	136.4743(5)	12.40(12)	10.61(11)
γ_4	230.264(19)	$4.0(4)\cdot10^{-4}$	$3.4(3)\cdot10^{-4}$
γ_5	339.66(3)	$5.4(5)\cdot10^{-3}$	$4.6(4)\cdot10^{-3}$
γ_6	352.325(19)	$2.75(18)\cdot10^{-3}$	$3.22(21)\cdot10^{-3}$
γ_7	366.738(19)	$7.1(5)\cdot10^{-4}$	$6.1(4)\cdot10^{-4}$
γ_8	569.92(4)	$1.7(1)\cdot10^{-2}$	$1.45(9)\cdot10^{-2}$
γ_9	691.99(4)	0.186(9)	0.159(8)
γ_{10}	706.40(4)	$6.5(6)\cdot10^{-3}$	$5.6(5)\cdot10^{-3}$

$\langle E_\gamma\rangle$ 114.7(5) keV

$\langle\langle E_\gamma\rangle\rangle$ 121.5(6) keV/decay

ΣI_γ 105.91(23) %

Γ_γ 0.561(30) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\Gamma_{\delta=30}$ 3.68(19) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

} No account taken of γ_1 (since its energy is less than 20 keV)

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i},%
$K_{\alpha 2}$	6.391	50.6(11)	17.0(7)
$K_{\alpha 1}$	6.404	100	33.7(12)
K_β	7.06-7.11	20.3(4)	6.8(3)

ΣI_{XK} 57.5(20) %

$\langle E_{\gamma+XK}\rangle$ 76.7(4) keV

$\langle\langle E_{\gamma+XK}\rangle\rangle$ 125.3(6) keV/decay

$\Sigma I_{\gamma+XK}$ 163.4(14) %

X_L (Fe)	E_{XL_i}, keV	I_{XL_i},%
L_1	0.615	0.050(13)
L_η	0.628	0.034(8)
L_α	0.705	0.46(11)
L_β	0.726	0.35(9)

ΣI_{xL} 0.90(9) %

γ_i	σL	α_K	α_n
γ_1	M1+E2	7.3(2)	8.17(12)
γ_2	M1+E2	0.0215(12)	0.0243(14)
γ_3	E2	0.134(3)	0.153(3)

e_i	E_{e_i}, keV	I_{e_i},%
$K(\gamma_1)$	7.301(1)	69.9(22)
$LMN(\gamma_1)$	13.69(1)	8.3(2)
$K(\gamma_2)$	114.949(2)	1.84(10)
$LMN(\gamma_2)$	121.21-122.05	0.24(1)
$K(\gamma_3)$	129.362(2)	1.42(4)
$LMN(\gamma_3)$	135.65-136.47	0.20(1)

ΣI_e 81.9(26) %

e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$,%
KLL	5.37-5.64	100	82.9(30)
KLX	6.16-6.40	23.9	19.8(9)
KXY	6.91-7.10	2.2	1.82(10)

$\Sigma I_{e_{AK}}$ 104.5(40) %

$E_{e_{AL}}$, keV	$\Sigma I_{e_{AL}}$,%
0.6-0.7	256(16)

$^{60}_{27}Co_{33}$

β^-, γ, X, e^-

$T_{1/2}$ 5.2711(13) a

Q_β 2823.64(11) keV

β^-_i	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i},%
β_1	197.7(2)		<0.002
β_2	317.90(12)	96.50(4)	99.91(4)
β_3	664.86(14)		<0.002
β_4	1491.14(12)	583.79(4)	0.09(4)

$\langle E_\beta \rangle$ 96.9(1) keV

$\langle\langle E_\beta \rangle\rangle$ 96.9(1) keV/decay

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i},%
γ_1	346.93(7)	$7.6(5)\cdot10^{-3}$	$7.6(5)\cdot10^{-3}$
γ_2	467.2(2)	$\leq 2.3\cdot10^{-4}$	$\leq 2.3\cdot10^{-4}$
γ_3	826.28(9)	$7.6(8)\cdot10^{-3}$	$7.6(8)\cdot10^{-3}$
γ_4	1173.237(3)	99.91(4)	99.89(4)
γ_5	1293.7	$\leq 1.1\cdot10^{-4}$	$\leq 1.1\cdot10^{-4}$
γ_6	1332.502(3)	100	99.925(3)
γ_7	2158.82(9)	$1.1(2)\cdot10^{-4}$	$1.1(2)\cdot10^{-4}$
γ_8	2505.81(3)	$\leq 3\cdot10^{-5}$	$\leq 3\cdot10^{-5}$
γ^+	511.00		0.012(2)

ΣI_{γ_i} 199.89(4) %

$\langle E_\gamma \rangle$ 1252.89(1) keV

$\langle\langle E_\gamma \rangle\rangle$ 2504.4(5) keV/decay

Γ_γ 12.93(18) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\Gamma_{\delta=30}$ 84.7(11) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i},%
$K_{\alpha 2}$	7.461	50.8(11)	$3.3(2)\cdot10^{-3}$
$K_{\alpha 1}$	7.478	100	$6.4(4)\cdot10^{-3}$
K_β	8.26	20.4(4)	$1.3(1)\cdot10^{-3}$

$\Sigma I_{X K_i}$	$1.10(7)\cdot10^{-2}$%
$\langle E_{XK}\rangle$	7.57(1) keV
$\langle\langle E_{XK}\rangle\rangle$	$8.3(5)\cdot10^{-4}$ keV/decay

KBK (internal conversion coefficients)

γ_i	σL	α_K	α_L	α_Π
γ_4	E2(+M3)	$1.51\cdot10^{-4}$	$0.147\cdot10^{-4}$	$1.70\cdot10^{-4}$
γ_6	E2	$1.14\cdot10^{-4}$	$0.111\cdot10^{-4}$	$1.29\cdot10^{-4}$

e_i	E_{e_i}, keV	I_{e_i},%
$K(\gamma_4)$	1169.910(3)	0.0151(3)
$L(\gamma_4)$	1172.6-1172.7	0.00147(3)
$K(\gamma_6)$	1324.187(3)	0.0114(3)
$L(\gamma_6)$	1331.9-1332.0	0.00111(2)

ΣI_{e_i}	0.0299(6) %	$\langle E_{e_i}\rangle$	1224(14) keV
$\langle\langle E_{e_i}\rangle\rangle$	0.366(8) keV/decay		

КПК (pair conversion coefficient)

γ_i	α_Π
γ_4	$1.5(5)\cdot10^{-5}$
γ_6	$4.7(7)\cdot10^{-5}$

$^{63}_{28}Ni_{35}$

β^-

$T_{1/2}$	100.1(20) a
Q_β	65.92(15) keV

E_β, keV	$\langle E_\beta\rangle$, keV	$\langle\langle E_\beta\rangle\rangle$, keV	I_β,%
65.92(15)	17.1(1)	17.1(1)	100

$^{65}_{30}Zn_{35}$

β^+,γ,X,e^-

$T_{1/2}$	244.12(10) days
Q_{β^+}	1350.8(6) keV

E_β, keV	$\langle E_\beta\rangle$, keV/decay	I_β,%
328.8(6)	144.0(3)	1.46(3)

$\langle\langle E_\beta\rangle\rangle$	2.10(4) keV

γ_i	E_γ, keV	I_γ,%
γ_1	344.9(2)	$3.0(3)\cdot10^{-3}$
γ_2	770.6(2)	$3.0(3)\cdot10^{-3}$
γ_3	1115.545(3)	50.70(10)
γ^+	511.00	2.92(6)

ΣI_γ	53.63(12)%	$\langle E_\gamma\rangle$	1082.6(4) keV
$\langle\langle E_\gamma\rangle\rangle$	580.5(12) keV/decay		
$\Gamma_{\delta,30}$	20.2(12) aGy·m^2·s^{-1}·Bq^{-1}		
Γ_γ	3.08(18) R·cm^2·h^{-1}·mCi^{-1}		

X_{K_i}	E_{XK_i}, keV	I_{XK_i}/I_{γ_3}	I_{XK_i},%
$K_{\alpha2}$	8.028	0.6596(27)	11.3(3)
$K_{\alpha1}$	8.048	0.6596(27)	22.2(5)
K_β	8.905	0.0911(9)	4.62(5)

ΣI_{XK}	38.1(2)	$\langle E_{XK}\rangle$	8.15(22) кэВ
$\langle\langle E_{XK}\rangle\rangle$	3.10(7) keV/decay		

KBK

γ_i	σL	α_K	α_Π
γ_3	M1+E2	$1.66(7)\cdot10^{-4}$	$1.85(7)\cdot10^{-4}$

e_i	E_{e_i}, keV	I_{e_i},%
$K(\gamma_3)$	1106.566(3)	$8.4(4)\cdot10^{-3}$

ΣI_{e_i}	$9.4(4)\cdot10^{-3}$%

$^{85}_{36}Kr_{49}$

β^-, γ, e

$T_{1/2}$	10.720(22) a
Q_β	687.4(20) keV

β_i^-	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i}, %
β_1	173.4(20)	56(1)	0.429(13)
β_2	687.4(20)	252(1)	99.571(13)

$\langle E_\beta \rangle$	251(1) keV
$\langle\langle E_\beta \rangle\rangle$	251(1) keV/decay

E_γ, keV	I_γ, %
514.009(12)	0.426(13)

Γ_γ	0.0126(9)	$R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$
$\Gamma_{\delta=30}$	0.082(6)	$aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$

e_i	E_{e_i}, keV	I_{e_i}, %
K	498.81(2)	$2.75(7) \cdot 10^{-5}$
L	511.94-512.21	$0.31(1) \cdot 10^{-3}$

$^{85}_{38}Sr_{52}$

β^-

$T_{1/2}$	28.4 (2) a
Q_{β^-}	546.2(20) keV

E_β, keV	$\langle E_\beta \rangle$, keV	I_β, %
546.2(20)	196.4(8)	100

$\langle\langle E_\beta \rangle\rangle$	196.4(8) keV/decay

$^{90}_{39}Y_{51}$

$\beta^-, \gamma^\pm, X, e^-$

$T_{1/2}$	64.1(1) h
Q_{β^-}	2281.5(25) keV

β_i^-	$E_{\beta i}$, keV	$\langle E_{\beta i} \rangle$, keV	$I_{\beta i}$, %
β_1	520.8(25)	187(1)	0.016(3)
β_2	2281.5(25)	934(1)	99.984(3)

$\langle E_\beta \rangle$	934(1) keV	$\langle\langle E_\beta \rangle\rangle$	934(1) keV/decay

E_γ, keV	I_γ, %
511.00	$0.68(7) \cdot 10^{-2}$

Γ_δ	$1.3(1) \cdot 10^{-3}$	$aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$
Γ_γ	$2.0(2) \cdot 10^{-4}$	$R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$

$\langle E_{XK} \rangle$	16.04(3) keV	ΣI_{XK}	$9.5(23) \cdot 10^{-3}$ %

$\langle E_{\gamma+XK} \rangle$	223(32) keV	$\langle\langle E_{\gamma+XK} \rangle\rangle$	0.036(5) keV/decay
$\Sigma I_{\gamma+XK}$	$1.6(2) \cdot 10^{-2}$ %		

e_i	E_{ei}	I_{ei}, %
K	1742.7(6)	0.013(3)

$^{99}_{43}Tc_{56}$

β^-, γ

$T_{1/2}$	$2.13(3)\cdot10^5$ a
Q_{β^-}	293.6(13) keV

β^-_i	$E_{\beta i}$, keV	$\langle E_{\beta i}\rangle$, keV	$I_{\beta i}$, %
β_1	204.0(14)	82(1)	$1.6\cdot10^{-3}$
β_2	293.6(13)	96(1)	.100

$\langle E_\beta\rangle$	96(1) keV	$\langle\langle E_\beta\rangle\rangle$	96(1) keV/decay

E_γ, keV	I_γ, %
89.6(4)	$6.5\cdot10^{-4}$

$\langle E_\gamma\rangle$	89.6(4) keV	$\langle\langle E_\gamma\rangle\rangle$	96(1) keV/decay

Γ_δ $1.2(2)\cdot10^{-5}$ aGy·m²·s⁻¹·Bq⁻¹

Γ_γ $1.9(2)\cdot10^{-6}$ R·cm²·h⁻¹·mCi⁻¹

KBK

σL	α_K	α_L	α_n
E2+M1	1.18	0.266	1.51

$^{106}_{44}Ru_{62}$

β^-

$T_{1/2}$	372.6(17) a
Q_{β^-}	39.4(3) keV

E_β, keV	$\langle E_\beta\rangle$, keV	I_β, %
39.4(3)	10.1(1)	100

$^{106}_{45}Rh_{61}$

β^-, γ, X, e^-

$T_{1/2}$	29.9(1) s
Q_{β^-}	3540(9) keV

β_i	$E_{\beta i}$, keV	$\langle E_{\beta i}\rangle$, keV	$I_{\beta i}$, %
β_1	138(9)	-	$1.2(2)\cdot10^{-5}$
β_2	164(9)	-	$1.1(2)\cdot10^{-5}$
β_3	240(9)	-	$9.2(2)\cdot10^{-4}$
β_4	266(9)	-	$9.5(8)\cdot10^{-4}$
β_5	288(9)	83(3)	$2.5(5)\cdot10^{-4}$
β_6	319(9)	93(3)	$4.2(2)\cdot10^{-3}$
β_7	377(9)	112(3)	$6.6(9)\cdot10^{-4}$
β_8	457(9)	140(4)	$2.9(2)\cdot10^{-3}$
β_9	485(9)	149(4)	0.0102(3)
β_{10}	503(9)	156(4)	$2.7(2)\cdot10^{-3}$
β_{11}	571(9)	-	$2.9(7)\cdot10^{-4}$
β_{12}	622(9)	200(4)	0.019(1)
β_{13}	638(9)	206(4)	$8.0(4)\cdot10^{-3}$
β_{14}	662(9)	215(4)	0.027(1)
β_{15}	712(9)	235(4)	$7.5(3)\cdot10^{-3}$
β_{16}	719(9)	237(4)	$8.7(4)\cdot10^{-3}$
β_{17}	756(9)	251(4)	$1.4(1)\cdot10^{-3}$
β_{18}	835(9)	293(4)	$8.8(4)\cdot10^{-3}$
β_{19}	913(9)	-	$8(2)\cdot10^{-5}$
β_{20}	916(9)	315(4)	0.090(4)
β_{21}	1040(9)	367(4)	0.029(1)
β_{22}	1055(9)	-	$1.1(2)\cdot10^{-3}$
β_{23}	1101(9)	393(4)	$2.2(8)\cdot10^{-3}$
β_{24}	1232(9)	447(4)	0.044(2)
β_{25}	1262(9)	461(4)	0.048(2)
β_{26}	1298(9)	477(4)	0.039(2)
β_{27}	1538(9)	582(4)	0.46(2)
β_{28}	1631(9)	623(4)	$2.7(3)\cdot10^{-3}$
β_{29}	1834(9)	714(4)	0.067(2)
β_{30}	1978(9)	778(4)	1.77(6)
β_{31}	2406(9)	978(4)	10.0(4)
β_{32}	2412(9)	979(4)	0.64(9)
β_{33}	3029(9)	1263(4)	8.1(3)
β_{34}	3540(9)	1505(4)	78.7(7)

γ_i	$E_{\gamma i}$, keV	$I'_{\gamma i}$	$I_{\gamma i}$, %
	$\langle E_\beta \rangle$		1409(3) keV
γ_1	333.5(4)	0.24(10)	$4.98(10)\cdot10^{-3}$
γ_2	428.40(20)	3.46(11)	0.071(3)
γ_3	434,25(20)	0.99(10)	0.020(2)
γ_4	439.17(27)	0.62(10)	0.013(2)
γ_5	511.858(2)	1000	20.4(4)
γ_6	552.4(6)	0.016(10)	$3(2)\cdot10^{-4}$
γ_7	569.4(6)	0.018(10)	$4(2)\cdot10^{-4}$
γ_8	578.3(2)	0.41(4)	$8.4(8)\cdot10^{-3}$
γ_9	616.22(9)	37(3)	0.76(7)
γ_{10}	621.93(6)	487(6)	9.93(23)
γ_{11}	661.6(2)	0.37(2)	$7.5(4)\cdot10^{-3}$
γ_{12}	680.25(14)	0.54(3)	0.011(1)
γ_{13}	684.8(2)	0.27(1)	$5.5(2)\cdot10^{-3}$
γ_{14}	702.8(10)	0.014(9)	$2.9(9)\cdot10^{-4}$
γ_{15}	715.9(2)	0.49(2)	0.010(5)
γ_{16}	717.4(2)	0.32(2)	$6.5(4)\cdot10^{-3}$
γ_{17}	751.3(2)	0.053(11)	$1.1(2)\cdot10^{-3}$
γ_{18}	873.49(5)	21.5(3)	0.438(10)
γ_{19}	942.6(4)	0.028(7)	$5.7(14)\cdot10^{-4}$
γ_{20}	1045.6(6)	0.65(8)	0.013(2)
γ_{21}	1050.41(6)	76.4(15)	1.56(4)
γ_{22}	1062.14(5)	1.57(2)	0.032(1)
γ_{23}	1108.7(1)	0.29(1)	$5.9(2)\cdot10^{-3}$
γ_{24}	1114.48(5)	0.58(1)	0.0118(3)
γ_{25}	1128.07(5)	19.8	0.40(1)
γ_{26}	1133.7	EO-transition	
γ_{27}	1150.2(2)	0.15(1)	$3.1(2)\cdot10^{-3}$
γ_{28}	1159.9(2)	$8(6)\cdot10^{-3}$	$2(1)\cdot10^{-4}$
γ_{29}	1180.73(8)	0.71(1)	0.0145(4)
γ_{30}	1194.54(5)	2.81(2)	0.057(1)
γ_{31}	1209.8(2)	0.022(5)	$4.5(10)\cdot10^{-4}$
γ_{32}	1258.8(2)	0.028(4)	$5.7(8)\cdot10^{-4}$
γ_{33}	1266.0(2)	0.051(5)	$1.0(1)\cdot10^{-3}$
γ_{34}	1305(2)	0.065(7)	$1.3(1)\cdot10^{-3}$
γ_{35}	1311.1(3)	0.037(7)	$7.5(15)\cdot10^{-4}$
γ_{36}	1355.7(3)	0.031(7)	$6.3(14)\cdot10^{-4}$
γ_{37}	1360.2(2)	0.109(6)	$2.2(1)\cdot10^{-3}$
γ_{38}	1372.3(2)	0.10(1)	$2.1(2)\cdot10^{-3}$
γ_{39}	1397.6(2)	0.13(1)	$2.6(2)\cdot10^{-3}$
γ_{40}	1489.6(6)	0.06(3)	$1.2(6)\cdot10^{-3}$
γ_{41}	1496.33(13)	1.09(3)	0.022(1)
γ_{42}	1498.8	0.33(2)	$6.7(4)\cdot10^{-3}$
γ_{43}	1562.25(6)	8.0(1)	0.163(4)
γ_{44}	1572.4(2)	0.09(1)	$1.8(2)\cdot10^{-3}$
γ_{45}	1577.2(2)	0.052(9)	$1.1(2)\cdot10^{-3}$
γ_{46}	1687.4(3)	0.027(6)	$5.5(12)\cdot10^{-4}$
γ_{47}	1693.2(3)	0.032(6)	$6.5(12)\cdot10^{-4}$
γ_{48}	1730.5(2)	0.109(6)	$2.22(12)\cdot10^{-3}$
γ_{49}	1766.25(5)	1.68(3)	0.034(1)
γ_{50}	1774.5(3)	0.06(1)	$1.3(2)\cdot10^{-3}$
γ_{51}	1784.1(3)	0.021(1)	$4.3(2)\cdot10^{-4}$
γ_{52}	1796.94(9)	1.36(2)	0.028(4)
γ_{53}	1855.0(2)	0.061(4)	$1.2(1)\cdot10^{-3}$
γ_{54}	1909.3(2)	0.070(5)	$1.4(1)\cdot10^{-3}$
γ_{55}	1927.22(9)	0.75(2)	0.0153(5)
γ_{56}	1954.6(4)	0.011(6)	$2(1)\cdot10^{-4}$
γ_{57}	1973.5(10)	$9(5)\cdot10^{-3}$	$2(1)\cdot10^{-4}$
γ_{58}	1988.44(8)	1.28(2)	0.0261(4)
γ_{59}	2093.3(4)	0.018(1)	$3.7(2)\cdot10^{-4}$
γ_{60}	2112.54(6)	1.71(3)	0.035(1)
γ_{61}	2185.7(5)	0.012(3)	$2.4(6)\cdot10^{-4}$
γ_{62}	2193.2(1)	0.24(1)	$4.9(2)\cdot10^{-3}$
γ_{63}	2242.4(1)	0.101(3)	$2.1(7)\cdot10^{-3}$
γ_{64}	2271.9(2)	0.067(4)	$1.36(8)\cdot10^{-3}$
γ_{65}	2309.0(1)	0.28(1)	$5.6(2)\cdot10^{-3}$
γ_{66}	2316.4(1)	0.31(1)	$6.4(2)\cdot10^{-3}$
γ_{67}	2366.04(7)	1.14(3)	0.029(1)
γ_{68}	2390.6(1)	0.32(1)	$6.5(2)\cdot10^{-3}$
γ_{69}	2405.96(9)	0.71(2)	0.0145(5)
γ_{70}	2439.1(1)	0.22(1)	$4.6(2)\cdot10^{-3}$
γ_{71}	2456.8(2)	0.014(2)	$2.9(4)\cdot10^{-4}$
γ_{72}	2484.6(2)	$4.4(3)\cdot10^{-3}$	$9(1)\cdot10^{-4}$
γ_{73}	2500.5(9)	0.036(4)	$7.3(8)\cdot10^{-4}$
γ_{74}	2525.2(6)	0.010(2)	$2.0(4)\cdot10^{-4}$
γ_{75}	2542.7(1)	0.145(4)	$3.0(1)\cdot10^{-3}$
γ_{76}	2571.1(2)	0.071(3)	$1.5(1)\cdot10^{-3}$
γ_{77}	2626.9(5)	$4(1)\cdot10^{-3}$	$8(2)\cdot10^{-5}$
γ_{78}	2651.4(2)	0.034(2)	$6.9(4)\cdot10^{-4}$
γ_{79}	2705.1(3)	0.123(5)	$2.5(1)\cdot10^{-3}$
γ_{80}	2709.5(3)	0.183(5)	$3.7(1)\cdot10^{-3}$
γ_{81}	2740.1(4)	0.012(2)	$2.4(4)\cdot10^{-4}$
γ_{82}	2787.3(7)	$4(2)\cdot10^{-3}$	$8(4)\cdot10^{-5}$
γ_{83}	2809.0(3)	0.034(2)	$6.9(4)\cdot10^{-4}$
γ_{84}	2821.1(3)	0.059(2)	$1.2(1)\cdot10^{-3}$
γ_{85}	2902.5(9)	$3(1)\cdot10^{-3}$	$6(2)\cdot10^{-5}$
γ_{86}	2917.9(3)	0.045(2)	$9.2(5)\cdot10^{-4}$
γ_{87}	3037.4(3)	0.050(2)	$1.0(1)\cdot10^{-3}$

γ_{88}	3055.0(4)	0.017(2)	$3.5(4)\cdot10^{-4}$
γ_{89}	3164.7(10)	$1.4(7)\cdot10^{-3}$	$3(1)\cdot10^{-5}$
γ_{90}	3249.8(5)	$2.5(13)\cdot10^{-3}$	$5(3)\cdot10^{-5}$
γ_{91}	3273.4(7)	$2.5(10)\cdot10^{-3}$	$5(2)\cdot10^{-5}$
γ_{92}	3300.5(11)	$4(1)\cdot10^{-4}$	$9(2)\cdot10^{-6}$
γ_{93}	3375.9(14)	$6(1)\cdot10^{-4}$	$1.1(2)\cdot10^{-5}$
γ_{94}	3401.8	$6.1(9)\cdot10^{-4}$	$1.2(2)\cdot10^{-5}$
ΣI_γ			34.5(5) %

$<E_\gamma>$ 612.8(13) keV

$<<E_\gamma>>$ 211.7(3) keV/decay

Γ_γ 1.19(5) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\Gamma_{\delta=30}$ 7.82(30) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

X_{K_i} (Pd)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i},%
$K_{\alpha2}$	21.020	52.9(10)	0.0326(10)
$K_{\alpha1}$	21.177	100	0.0616(18)
K_{β_1}	23.79-24.01	24.9(5)	0.0153(4)
K_{β_2}	24.30-24.35	3.98(9)	$2.5(7)\cdot10^{-3}$

ΣI_{XK_i} 0.112(2)% $\Sigma I_{\gamma+XK}$ 34.6(5)%

KBK

γ_i	σL	α_K	α_L	α_n	α_M
γ_5	E2	$4.85\cdot10^{-3}$	$6.10\cdot10^{-4}$	$1.13\cdot10^{-4}$	$5.59\cdot10^{-5}$
γ_9	E2(+M1)	$2.90\cdot10^{-3}$	$3.70\cdot10^{-4}$	$6.5\cdot10^{-5}$	$3.35\cdot10^{-3}$
γ_{10}	E2	$2.85\cdot10^{-3}$	$3.50\cdot10^{-4}$	$6.2\cdot10^{-5}$	$3.27\cdot10^{-3}$
γ_{21}	M1(+E2)	$9.00\cdot10^{-4}$	-	-	-
γ_{25}	E2	$6.60\cdot10^{-4}$	-	-	-

γ_i	e_i	E_{e_i}, keV	I_{e_i}%
γ_5	K	487.506(22)	0.0989(22)
	L	508.26-508.69	0.0124(3)
	M	511.19-511.53	$2.30(4)\cdot10^{-3}$
ΣI_{e_i} for γ_5			0.1136(25)%
γ_9	K	597.87(22)	$2.2(2)\cdot10^{-3}$
γ_{10}	K	597.58(6)	0.0283(7)
	L	618.33-618.76	$3.5(1)\cdot10^{-3}$
ΣI_{e_i} for γ_{10}			0.032(1)%
γ_{21}	K	1026.06(6)	$1.4(4)\cdot10^{-3}$
γ_{25}	K	1103.72(5)	$2.7(1)\cdot10^{-4}$
γ_{26}	K	1109.4	$4.8(4)\cdot10^{-3}$

$<E_e>$ 521.6(4) keV

$^{109}_{48}Cd_{61}$

γ, X, e^-, e_A

$T_{1/2}$ 462.3(4) days

$I_{\varepsilon K}$,%	$I_{\varepsilon L}$,%	$I_{\varepsilon MN}$,%
78.8(10)	17.2(5)	4.0(4)

E_γ, keV	I_γ,%
88.0341(11)	3.65(2)

Γ_γ 0.0147(9) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\Gamma_{\delta=30}$ 0.096(6) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

X_{K_i} (Ag)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i},%
$K_{\alpha2}$	21.990	52.9(11)	28.8(7)
$K_{\alpha1}$	22.163	100	54.5(14)
K_{β_1}	24.934	27.2(5)	14.8(4)
K_{β_2}	25.603	4.7	2.56(6)

ΣI_{XK} 100.7(15) %

$<E_{\gamma+XK}>$ 24.9(2) keV

$<<E_{\gamma+XK}>>$ 26.0(4) keV/decay

$\Sigma I_{\gamma+XK}$ 104.3(16) %

$\Gamma_{\gamma+XK}$ 1.91(8) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\Gamma_{\delta=20}$ 12.5(5) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

X_{L_i} (Ag)	E_{XL_i}, keV	I_{XL_i},%
L_1	2.634	0.21(3)
L_η	2.806	0.11(2)
L_α	2.984	5.8(9)
L_β	3.214	4.2(7)
L_γ	3.570	0.41(7)

ΣI_{XL}			10.7(16) %
e_i	E_{e_i}, keV	I'_{e_i}	I_{e_i},%
K	62.520(2)	100(3)	41.6(12)
L_1	84.228(2)	5.5(11)	2.3(5)
L_2	84.510(2)	48.1(16)	20.0(9)
L_3	84.683(2)	53.6(18)	22.3(10)
M	87.316-87.667	21.0(7)	8.7(4)
NO	87.94-88.03	3.55(17)	1.45(8)
ΣI_{e_i}			96.35(2) %
e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$,%
KLL	17.79-18.70	100	13.4
KLX	20.95-22.15	42.3	5.6(6)
KXY	24.05-25.50	5.4	0.8(1)
$\Sigma I_{e_{AK}}$			19.8(6) %
	$E_{e_{AL}}$, keV	$\Sigma I_{e_{AL}}$,%	
	1.8-3.8	168(10)	

$^{110m}_{47}Ag^{63}$ + $^{110}_{47}Ag^{63}$

β^-, γ, X, e

$T_{1/2}(^{110m}Ag)$ 249.74(5) days $T_{1/2}(^{110}Ag)$ 24.62 s

Q_{it} 117.53(5) keV $Q_{\beta^-}(^{110}Ag)$ 2892.7(17) keV
$Q_{\beta^+}(^{110}Ag)$ 879(19) keV $Q_{\beta^-}(^{110m}Ag)$ 3010.2(17) keV
$Q_{\beta^+}(^{110m}Ag)$ 997(19) keV

I_{it} (^{110m}Ag)			1.36(5) %
ΣI_{β^-} (^{110m}Ag)			98.64(5) %
β_i^-	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i},%
β_1	83.7(17)	22.2(20)	67.6(12)
β_2	133.7(18)	35.1(20)	0.40(2)
β_3	168.1(18)	45.4(20)	0.051(4)
β_4	217.0(18)	62.0(20)	0.076(7)
β_5	303.5(18)	90.3(20)	0.065(7)
β_6	304.9(18)	90.9(20)	0.075(7)
β_7	350.5(18)	106(2)	0.078(8)
β_8	470.8(18)	147(2)	0.08(2)
β_9	530.5(17)	166(2)	30.3(6)
β_{10}	2235.0(17)	893(2)	0.062(4)
β_{11}	2892.7(17)	1197(2)	1.30(4)
$\langle E_\beta \rangle$			82.5(14) keV
γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i},%
γ_1	1.113(10)	0.00154(8)	0.00146(7)
γ_2	116.42(5)	0.0085(3)	0.0080(3)
γ_3	120.244(26)	0.0018(1)	0.0017(1)
γ_4	133.330(7)	0.079(4)	0.075(4)
γ_5	219.438(30)	0.011(1)	0.010(1)
γ_6	221.143(29)	0.072(2)	0.068(2)
γ_7	229.363(20)	0.013(2)	0.012(2)
γ_8	264.25(6)	0.0061(4)	0.0058(4)
γ_9	266.788(20)	0.042(2)	0.040(2)
γ_{10}	295.30(8)	$1.00(14)\cdot10^{-4}$	$9.4(13)\cdot10^{-5}$
γ_{11}	341.40(10)	0.024(4)	0.023(4)
γ_{12}	356.24(7)	0.0045(4)	0.0042(4)
γ_{13}	360.13(8)	0.0035(7)	0.0033(7)
γ_{14}	365.459(25)	0.098(6)	0.092(6)
γ_{15}	387.074(9)	0.0547(20)	0.0516(19)
γ_{16}	396.938(23)	0.0394(20)	0.0372(19)
γ_{17}	409.38(5)	0.034(7)	0.032(7)
γ_{18}	446.811(3)	3.914(25)	3.693(24)
γ_{19}	467.10(9)	0.026(5)	0.026(5)
γ_{20}	483.09(8)	0.0160(14)	0.0151(14)
γ_{21}	493.20(9)	0.010(1)	0.010(1)
γ_{22}	544.53(5)	0.019(2)	0.018(2)
γ_{23}	572.7(1)	0.018(1)	0.017(1)
γ_{24}	603.1(2)	0.0040(10)	0.038(10)
γ_{25}	620.360(3)	2.932(18)	2.766(17)
γ_{26}	626.244(10)	0.238(7)	0.224(7)
γ_{27}	630.6(1)	0.035(2)	0.033(2)
γ_{28}	657.7622(21)	100	94.32(7)
γ_{29}	661.1(2)	0.016(2)	0.015(2)
γ_{30}	677.6227(24)	11.28(5)	10.64(5)
γ_{31}	687.015(3)	6.85(6)	6.46(6)
γ_{32}	706.683(3)	17.53(20)	16.54(2)
γ_{33}	708.122(20)	0.22(2)	0.21(2)
γ_{34}	744.277(3)	4.964(22)	4.683(22)

γ_{35}	763.944(3)	23.79(25)	22.45(24)
γ_{36}	774.77(20)	0.0020(10)	0.0019(10)
γ_{37}	815.32(2)	$5.0(12)\cdot10^{-4}$	$4.7(11)\cdot10^{-4}$
γ_{38}	818.031(4)	7.78(4)	7.34(4)
γ_{39}	884.685(3)	77.5(3)	73.1(3)
γ_{40}	937.493(4)	36.41(12)	34.35(12)
γ_{41}	957.37(9)	0.010(1)	0.010(1)
γ_{42}	997.23(2)	0.140(5)	0.132(5)
γ_{43}	1018.92(5)	0.015(1)	0.014(1)
γ_{44}	1074.0(12)	$1.2(6)\cdot10^{-5}$	$1.1(6)\cdot10^{-5}$
γ_{45}	1085.435(14)	0.07(3)	0.067(3)
γ_{46}	1117.45(3)	0.0512(20)	0.0483(20)
γ_{47}	1125.69(2)	0.0322(20)	0.0304(20)
γ_{48}	1163.14(8)	0.079(7)	0.075(7)
γ_{49}	1164.88(9)	0.050(5)	0.047(5)
γ_{50}	1186.88(9)	0.0015(5)	0.0014(5)
γ_{51}	1251.03(5)	0.0270(12)	0.0255(11)
γ_{52}	1300.00(10)	0.0200(10)	0.0189(10)
γ_{53}	1334.30(2)	0.143(6)	0.135(6)
γ_{54}	1384.300(3)	26.47(9)	24.98(9)
γ_{55}	1421.01(3)	0.025(2)	0.024(2)
γ_{56}	1475.788(6)	4.253(20)	4.011(20)
γ_{57}	1505.040(5)	14.17(12)	13.37(12)
γ_{58}	1527.85(10)	0.0030(4)	0.0028(4)
γ_{59}	1562.302(5)	1.270(6)	1.198(6)
γ_{60}	1572.31(20)	0.0011(3)	0.0010(3)
γ_{61}	1592.70(10)	0.0218(13)	0.0206
γ_{62}	1629.65(6)	0.042(5)	0.040(5)
γ_{63}	1674.30(13)	$9.4(5)\cdot10^{-5}$	$8.9(5)\cdot10^{-5}$
γ_{64}	1775.377(39)	0.0063(3)	0.0059(3)
γ_{65}	1783.435(30)	0.0098(5)	0.0092(5)
γ_{66}	1903.482(35)	0.0170(10)	0.0160(10)
γ_{67}	2004.65(10)	0.0011(2)	0.0010(2)

ΣI_{γ_i} 321.6(5) %

$\langle E_\gamma \rangle$ 858.6(15) keV

$\langle\langle E_\gamma \rangle\rangle$ 2761(6) keV/decay

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i},%
$K_{\alpha 2}$	22.984(1)	53.2(11)	0.139(11)
$K_{\alpha 1}$	23.174(1)	100	0.262(15)
K_β	26.061-26.643	32.6(6)	0.085(7)

ΣI_{XK} 0.486(20) %

$\Sigma I_{\gamma+XK}$ 322.1(5) %

$\langle E_{\gamma+XK} \rangle$ 857.3(15) keV $\langle\langle E_{\gamma+XK} \rangle\rangle$ 2762(6) keV/decay

$\Gamma_{\gamma+XK}$ 15.2(6) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\Gamma_{\delta=20}$ 99.6(40) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

γ_i	σL	α_K	α_L	α_n
γ_1	E1	-	-	930
γ_2	M4	106	50.5	169
γ_{18}	M1+13%E2	$7.73\cdot10^{-3}$	$9.44\cdot10^{-4}$	$8.91\cdot10^{-3}$
γ_{25}	M1+33%E2	$3.39\cdot10^{-3}$	$4.07\cdot10^{-4}$	$7.35\cdot10^{-3}$
γ_{28}	E2	$2.72\cdot10^{-3}$	$3.41\cdot10^{-4}$	$3.15\cdot10^{-3}$
γ_{30}	M1+11%E2	$2.80\cdot10^{-3}$	$3.34\cdot10^{-4}$	$3.22\cdot10^{-3}$
γ_{31}	M1+76%E2	$2.51\cdot10^{-3}$	$3.03\cdot10^{-4}$	$2.90\cdot10^{-3}$
γ_{32}	M1+67%E2	$2.37\cdot10^{-3}$	$2.60\cdot10^{-4}$	$2.73\cdot10^{-3}$
γ_{34}	E2	$1.99\cdot10^{-3}$	$2.45\cdot10^{-4}$	$2.30\cdot10^{-3}$
γ_{35}	E2	$1.87\cdot10^{-3}$	$2.29\cdot10^{-4}$	$2.16\cdot10^{-3}$
γ_{38}	M1+65%E2	$1.67\cdot10^{-3}$	$1.99\cdot10^{-4}$	$1.91\cdot10^{-3}$
γ_{39}	E2	$1.31\cdot10^{-3}$	$1.59\cdot10^{-4}$	$1.51\cdot10^{-3}$
γ_{40}	E2	$1.15\cdot10^{-3}$	$1.38\cdot10^{-4}$	$1.33\cdot10^{-3}$
γ_{54}	M1+6%E2	$5.64\cdot10^{-4}$	$6.56\cdot10^{-5}$	$6.45\cdot10^{-4}$
γ_{56}	E2	$4.39\cdot10^{-4}$	$5.14\cdot10^{-5}$	$5.03\cdot10^{-4}$
γ_{57}	M1+23%E2	$4.70\cdot10^{-4}$	$5.45\cdot10^{-5}$	$5.38\cdot10^{-4}$
γ_{59}	E2	$3.93\cdot10^{-4}$	$4.58\cdot10^{-5}$	$4.51\cdot10^{-4}$

γ_i	e_i	E_{e_i}, keV	I'_{e_i}	I_{e_i}%
γ_2	K	88.48(5)	31(16)	0.85(4)
	L	112.18-112.69	159(8)	0.41(2)
γ_{18}	K	420.100(3)	9.0(9)	0.023(2)
γ_{25}	K	593.649(3)	3.2(3)	0.0082(8)
γ_{28}	K	631.051(2)	100	0.257(3)
	L	653.74-654.22	12.3(9)	0.0316(23)
γ_{30}	K	650.912(2)	10.5(8)	0.0270(20)
	L	673.61-674.09	1.2(3)	0.0031(8)
γ_{31}	K	660.304(3)	6.1(5)	0.0157(13)
	L	682.99-683.47	0.7(2)	0.0018(5)
γ_{32}	K	679.972(3)	16.0(9)	0.0411(23)
	L	702.66-703.14	1.80(15)	0.0046(4)
γ_{34}	K	717.566(3)	4.1(3)	0.0105(8)
	L	740.26-740.74	0.3(1)	0.0077(25)
γ_{35}	K	737.233(3)	16.3(5)	0.0419(13)
	L	759.93-760.40	1.93(15)	0.0050(4)

γ_{38}	K	791.320(4)	4.6(3)	0.0118(8)
	L	814.01-814.49	0.4(1)	0.0010(3)
γ_{39}	K	857.974(3)	37.7(8)	0.0969(20)
	L	880.66-881.14	4.6(5)	0.0118(13)
γ_{40}	K	910.782(4)	15.1(5)	0.0388(13)
	L+M	933.5-936.9	2.2(2)	0.0056(5)
γ_{53}	K	1357.589(3)	5.2(3)	0.0134(8)
	L+M	1380.3-1383.7	0.72(6)	0.00185(16)
γ_{56}	K	1449.077(6)	0.68(8)	0.00170(20)
γ_{57}	K	1478.329(5)	2.3(2)	0.0059(5)
	L+M	1501.0-1504.4	0.31(8)	0.0008(2)
γ_{59}	K	1535.591(5)	0.22(3)	0.00057(8)
ΣI_e				2.10(5) %
$<E_e>$		288(7) keV		
$<<E_e>>$		6.05(20) keV/decay		

$^{125}_{51}Sb_{74} + {}^{125m}_{52}Te_{73}$

β^-, γ, X, e^-

$T_{1/2}$ (^{125}Sb)	2.758(8)	a
$T_{1/2}$ (^{125m}Te)	57.40(5)	days

Q_β 766.7(20) keV

β_i	E_{β_i}, keV	$<E_{\beta_i}>$, keV	I_{β_i}, %
β_1	95(2)	25(1)	13.4(2)
β_2	125(2)	33(1)	5.8(1)
β_3	131(2)	35(1)	18.0(4)
β_4	242(2)	67(1)	1.63(3)
β_5	303(2)	87(1)	40.2(4)
β_6	323(2)	93(1)	0.33(2)
β_7	446(2)	134(1)	7.3(1)
β_8	622(2)	216(1)	13.6(13)

$<E_\beta>$ 86(2) keV

$<<E_\beta>>$ 86(2) keV/decay

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	35.4919(5)	20.0(5)	5.93(10)
γ_2	109.279(15)	0.23(3)	0.067(4)
γ_3	116.954(11)	0.871(14	0.259(5)
γ_4	172.619(15)	0.66(1)	0.196(4)
γ_5	176.338(11)	23.06(7)	6.85(9)
γ_6	178.78(5)	0.130(5)	0.039(2)
γ_7	198.65(6)	0.081(4)	0.024(2)
γ_8	204.134(25)	1.09(2)	0.324(6)
γ_9	208.093(25)	0.806(14	0.239(5)
γ_{10}	227.91(4)	0.441(12	0.131(4)
γ_{11}	314.94(11)	0.013(2)	$3.9(6)\cdot10^{-3}$
γ_{12}	321.05(3)	1.402(14)	0.416(6)
γ_{13}	380.445(20)	5.12(3)	1.52(2)
γ_{14}	408.02(4)	0.61(2)	0.181(6)
γ_{15}	427.911(15)	100	29.7(4)
γ_{16}	443.54(4)	1.03(2)	0.306(7)
γ_{17}	463.407(17)	35.21(14)	10.45(15)
γ_{18}	600.597(23)	59.6(3)	17.7(3)
γ_{19}	606.656(19)	16.9(1)	5.01(7)
γ_{20}	635.910(19)	37.8(2)	11.2(2)
γ_{21}	671.431(20)	6.04(3)	1.79(3)

ΣI_γ	92.3(7)%
$<E_\gamma>$	458(1) keV
$<<E_\gamma>>$	423(1) keV/decay

X_{K_i}	E_{XK_i}, кэВ	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	27.202	53.7(11)	21.4(5)
K_{α_1}	27.472	100	39.8(8)
K_β	31.10	34.6(7)	13.8(3)

ΣI_{XK}	75.0(15)%
$\Sigma I_{\gamma+XK}$	167.3(17)%

$\Gamma_{\delta-27}$	21.0(5) aGy·m^2·s^{-1}·Bq^{-1}
$\Gamma_{\gamma+XK}$	3.20(8) R·cm^2·h^{-1}·mCi^{-1}

$<E_{XL}>$, keV	ΣI_{XL}, %
4.01	7.4(5)

KBK

γ_i	σL	α_K	α_L	α_Π
γ_1	M1	12.0	1.58	14
γ_2	M4	189	135	366
γ_{17}	E2	$8.6\cdot10^{-3}$	$1.2\cdot10^{-3}$	0.010
γ_{18}	E2	$4.2\cdot10^{-3}$	$5.7\cdot10^{-4}$	$5.0\cdot10^{-3}$

e_i	E_{e_i}, keV	I'_{e_i}	I_{e_i}, %
$K(\gamma_1)$	3.6781(5)		71.2(15)
$L(\gamma_1)$	30.55-31.15		9.4(2)
$K(\gamma_2)$	77.47(2)		12.7(8)
$K(\gamma_3)$	85.14(1)	6.2(7)	0.022(2)
$L(\gamma_2)$	104.34-104.94		9.0(5)
$K(\gamma_4)$	140.80(3)	5.4(5)	0.020(2)
$K(\gamma_5)$	144.53(1)	267(13)	0.94(5)
$L(\gamma_5)$	171.40-172.00	45(4)	0.16(1)
$K(\gamma_8)$	172.31(3)	7.8(4)	0.027(2)
$M(\gamma_5)$	175.33-175.77	16(5)	0.06(2)
$K(\gamma_9)$	176.28(3)	6.5(4)	0.022(2)
$K(\gamma_{10})$	196.06(4)	3.3(5)	0.012(2)
$K(\gamma_{13})$	348.65(2)	6.3(6)	0.022(2)
$K(\gamma_{15})$	396.10(2)	100	0.352(9)
$L(\gamma_{15})$	422.97-423.57	14.1(8)	0.050(3)
$M(\gamma_{15})$	426.90-427.34	4(2)	0.014(7)
$K(\gamma_{17})$	431.59(2)		0.090(2)
$L(\gamma_{17})$	458.47-459.07		0.012(1)
$K(\gamma_{18})$	468.78(2)		0.075(2)
$K(\gamma_{19})$	574.72(2)	5.6(5)	0.020(2)
$L(\gamma_{18})$	595.66-596.20		0.0101(3)
$K(\gamma_{20})$	604.10(2)	13.4(7)	0.047(3)

ΣI_{e_i}	104.5(17)%
$\langle E_e \rangle$	26(1) keV
$\langle\langle E_e \rangle\rangle$	27(1) keV/decay

$^{125}_{52}Te_{73}$

γ, X, e^-

$T_{1/2}$	57.40(5) days
$Q_{M\Pi}$	144.771(16) keV

γ_i	E_{γ_i}, keV	I_{γ_i}, %
γ_1	35.4919(5)	6.67(12)
γ_2	109.279(15)	0.272(5)

ΣI_γ	6.94(12)%

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	27.202	53.7(11)	32.8(12)
K_{α_1}	27.473	100	63.0(23)
$\langle K_\beta \rangle$	31.10	34.6(7)	21.2(8)

ΣI_{XK}	115(4)%
$\Sigma I_{\gamma+XK}$	122(4)%
$\langle E_{\gamma+XK} \rangle$	28.6(1) keV
$\langle\langle E_{\gamma+XK} \rangle\rangle$	34.9(1) keV/decay
$\Gamma_{\delta=27}$	7.7(3) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$
$\Gamma_{\gamma+XK}$	3.20(8) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

$\langle E_{XL} \rangle$	ΣI_{XL}, %
4.01	12.3(12)

KBK

γ_i	σL	α_K	α_L	α_M	α_Π
γ_1	M1	12.0	1.58	0.314	14.0
γ_2	M4	189	135	31	366

e_i	E_{e_i}, keV	I_{e_i}, %
$K(\gamma_1)$	3.677(16)	80.0(23)
$L(\gamma_2)$	30.55-31.15	10.5(3)
$M(\gamma_1)$	34.49-34.92	2.09(6)
$K(\gamma_2)$	77.47(2)	51.5(15)
$L(\gamma_2)$	103.34-104.94	36.8(12)
$M(\gamma_2)$	108.28-108.71	8.4(2)
ΣI_{e_i}	193.06(12)%	
$\langle E_e \rangle$	49.9(6) keV	
$\langle\langle E_e \rangle\rangle$	96.3(9) keV/decay	

$^{129}_{53}I_{76}$

$\beta^-, \gamma, X, e^-, e_A$

$T_{1/2}$	$1.60(7)\cdot10^7$ a
Q_β	190.8(11) keV

E_β, keV	$\langle E_\beta \rangle$, keV	I_β, %
151.2(10)	41.0(5)	100

E_γ, keV	I_γ, %
39.578(2)	7.46(22)

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	29.461(2)	53.9(11)	20.0(4)
K_{α_1}	29.782(2)	100	37.1(8)
$K_{\beta'_1}$	33.606(2)	35.5(7)	10.6(5)
$K_{\beta'_2}$	34.43(1)	35.5(7)	2.6(3)
ΣI_{XK}	70.3(8) %		
$\Sigma I_{\gamma+XK}$	77.8(11) %		
$\langle E_{\gamma+XK} \rangle$	31.32(32) keV		
$\langle\langle E_{\gamma+XK} \rangle\rangle$	24.35(34) keV/decay		

$\Gamma_{\delta-29}$	4.18(16) $aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$
$\Gamma_{\gamma+XK}$	0.638(25) $R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$

X_L (Xe)	E_{XL_i}, keV	I_{XL_i}, %
L_1	3.634	0.13(2)
L_η	3.955	0.06(1)
L_α	4.104	3.5(5)
L_β	4.522	3.0(4)
L_γ	5.121	0.40(6)
ΣI_{XL}		7.1(10) %

KBK

σL	α_K	α_L	α_n
M1	10.6(3)	1.39(4)	12.4(4)

e_i	E_{e_i}, keV	I_{e_i}, %
K	5.014(2)	79.1(30)
L1	34.125(2)	9.2(5)
L2	34.474(2)	0.92(5)
L3	34.796(2)	0.28(2)
M	38.43-38.90	2.2(1)
NO	39.36-39.58	0.80(4)
ΣI_{e_i}		92.54(22) %
$\langle E_e \rangle$	9.4(2) keV	
$\langle\langle E_e \rangle\rangle$	8.7(3) keV/decay	

e_{AK}	$E_{e_{AK}}$, кэВ	$I'_{e_{AK}}$	$I_{e_{AK}}$, %
KLL	23.51-24.84	100	5.8(6)
KLX	27.89-29.77	46.3	2.7(3)
KXY	32.21-34.53	6.3	0.36(4)
$\Sigma I_{e_{AK}}$			8.8(9) %
$\Sigma I_{e+e_{AK}}$			101.3(9) %
$\langle E_{e+e_{AK}} \rangle$	10.8(3) keV		
$\langle\langle E_{e+e_{AK}} \rangle\rangle$	11.0(5) keV/decay		

$^{134}_{55}Cs_{79}$

$\beta^-, \gamma, X, e^-, e_A$

$T_{1/2}$ 2.0651(6) a

Q_{β^-} 2058.5(4) keV
Q_c 1212(10) keV

β_i	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i}, %
β_1	88.6(4)	23.1(1)	27.27(8)
β_2	415.2(4)	123.4(2)	2.51(1)
β_3	657.9(4)	210.1(2)	70.24(8)
β_4	890.5(4)	299.9(2)	≤0.045
β_5	1453.8(4)	534.5(2)	≤0.008

$\langle E_\beta \rangle$ 157.0(2) keV
$\langle\langle E_\beta \rangle\rangle$ 157.0(2) keV/decay

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	242.738(8)	0.0278(30)	0.0271(30)
γ_2	326.589(13)	0.0166(10)	0.0162(10)
γ_3	475.365(2)	1.522(10)	1.486(10)
γ_4	563.246(4)	8.55(4)	8.36(4)
γ_5	569.330(2)	15.75(6)	15.38(6)
γ_6	604.721(2)	100	97.62(3)
γ_7	795.864(3)	87.5(3)	85.53(4)
γ_8	801.953(3)	8.90(4)	8.69(4)
γ_9	847.0(2)	0.0003(1)	0.0003(1)
γ_{10}	1038.610(7)	1.012(4)	0.988(4)
γ_{11}	1167.968(5)	1.833(7)	1.789(7)
γ_{12}	1365.193(3)	3.087(12)	3.014(12)

X_{K_i}(Ba)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	31.817	54.3(19)	0.254(9)
K_{α_1}	32.194	100	0.468(14)
$K_{\beta'_1}$	36.357	29.7(9)	0.139(4)
$K_{\beta'_2}$	37.450	6.6(8)	0.031(4)

ΣI_{XK} 0.892(27) %
$\Sigma I_{\gamma+XK}$ 223.8(1)%

$\langle E_{\gamma+XK} \rangle$ 693.3(1) keV
$\langle\langle E_{\gamma+XK} \rangle\rangle$ 1545.2(2) keV/decay

$\Gamma_{\gamma+XK}$ 8.79(31) $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$

$\Gamma_{\delta=30}$ 57.6(20) $aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$

X_L	E_{XL_i}, keV	I_{XL_i}, %
L_l	3.954	$1.6(2) \cdot 10^{-3}$
L_η	4.331	$7.0(7) \cdot 10^{-3}$
L_α	4.465	0.044(5)
L_β	4.946	0.039(4)
L_γ	5.613	$5.1(5) \cdot 10^{-3}$

ΣI_{XL} 0.09(1)%

γ_i	σL	α_K	α_L	α_n
γ_1	M1+E2	0.073(1)	0.012(2)	0.088(2)
γ_2	M1+E2	0.031(3)	0.0047(3)	0.037(2)
γ_3	M1+E2	0.0100(6)	0.00146(6)	0.0119(7)
γ_4	M1+E2	0.0057(3)	0.00089(5)	0.0069(4)
γ_5	M1+E2	0.0078(4)	0.00105(7)	0.0092(5)
γ_6	E2	0.00503	0.00072	0.00599
γ_7	E2	0.00262(13)	0.00035(1)	0.00309(14)
γ_8	E2	0.00270(18)	0.00034(2)	0.00315(21)
γ_{10}	M1+E2	0.00172(11)	0.00020(1)	0.00199(13)
γ_{11}	E2	0.00117(7)	0.00014(1)	0.00136(8)
γ_{12}	E2	0.00082(14)	0.00010(1)	0.00095(5)

e_i	E_{e_i}, keV	I_{e_i}, %
$K(\gamma_1)$	205.297(8)	0.0020(3)
$K(\gamma_2)$	289.148(13)	0.00050(6)
$K(\gamma_3)$	437.924(2)	0.0149(9)
$L(\gamma_3)$	469.38-470.12	0.0022(1)
$MN+(\gamma_3)$	474.07-475.35	0.00059(3)
$K(\gamma_4)$	525.805(4)	0.048(3)
$K(\gamma_5)$	531.889(2)	0.120(6)
$L(\gamma_4)$	557.26-558.00	0.0074(4)
$MN+(\gamma_4)$	561.95-563.23	0.0024(2)
$L(\gamma_5)$	563.34-564.08	0.0162(10)
$K(\gamma_6)$	567.280(2)	0.48(1)

MN+(γ_5)	568.04-569(32)	0.0052(3)
L(γ_6)	598.73-599(47)	0.070(2)
MN+(γ_6)	603.43-604.71	0.023(1)
K(γ_7)	758.423(3)	0.224(12)
K(γ_8)	764.512(3)	0.024(2)
L(γ_7)	789.88-790.62	0.030(1)
MN+(γ_7)	794.57-795.85	0.010(1)
L(γ_8)	795.96-796.70	0.0030(2)
MN+(γ_8)	800.66-801.94	0.0010(1)
K(γ_{10})	1001.169(7)	0.0017(1)
L(γ_{10})	1032.62-1033.36	0.00020(1)
K(γ_{11})	1130.527(5)	0.0021(2)
L(γ_{11})	1161.98-1162.72	0.00025(2)
K(γ_{12})	1327.752(3)	0.0025(2)
L(γ_{12})	1359.20-1359.94	0.00030(3)

e_{AK}

$E_{e_{AK}}$, keV	$\Sigma I_{e_{AK}}$, %
25.3-37.4	0.09(1)

e_{AL}

$E_{e_{AL}}$, keV	$\Sigma I_{e_{AL}}$, %
2.6-5.8	0.85(5)

$^{137}_{55}Cs_{82}$

$\beta^-, \gamma, X, e^-, e_A$

$T_{1/2}$ (^{137}Cs)	30.21(11) a
$T_{1/2}$ (^{137m}Ba)	2.554(2) min
Q_β	1175.69(23) keV

β_i	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i}, %
β_1	514.03(23)	173.4(4)	94.59(12)
β_2	1175.69(23)	415.2(4)	5.41(12)

$\langle E_\beta \rangle$ 186.5(4) keV

E_γ, keV	I_γ, %
661.660(2)	85.22(7)

X_{K_i}(Ba)	E_{XK_i}, keV	I_{XK_i}/I_γ	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	31.817	0.0671(13)	54.3(11)	2.02(6)
K_{α_1}	32.194		100	3.71(11)
$K_{\beta'_1}$	36.343	0.0161(13)	29.6(6)	1.10(3)
$K_{\beta'_2}$	37.255		7.0(2)	0.26(1)
ΣI_{XK_i}				7.09(16) %
$\Sigma I_{\gamma+XK}$				92.29(18) %

$\langle E_{\gamma+XK} \rangle$ 613.36(7) keV

$\langle\langle E_{\gamma+XK} \rangle\rangle$ 566.1(7) keV/decay

$\Gamma_{\gamma+XK}$	3.27(19)	$R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$
$\Gamma_{\delta-30}$	21.4(13)	$aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$

X_{L_i}(Ba)	E_{XL_i}, keV	I'_{XL_i}	I_{XL_i}, %
L_1	3.956(1)	0.016(1)	0.014(1)
$L_{\alpha\eta}$	4.466(1)	0.56(2)	0.48(2)
L_β	4.829(1)	0.45(2)	0.38(2)
L_γ	5.531(1)	0.055(3)	0.047(3)
ΣI_{XL_i}			0.92(4) %

α_K/α_L 5.25(16) α_K/α_{LMNO} 4.48(4)

α_K	α_L	α_Π
0.090(1)	0.0174(5)	0.110(1)

e_i	E_{e_i}, keV	I'_{e_i}	I_{e_i}, %
K	624.219(3)	1000	7.67(9)
L1	655.671(3)	151(5)	1.16(4)
L2	656.036(3)	22(1)	0.17(1)
L3	656.413(3)	19(1)	0.15(1)
MNO	660.37-661.65		0.22(1)
ΣI_{e_i}			9.37(9) %

e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$, %
KLL	25.31-26.78	100	0.38(13)
KLX	30.09-32.18	47	0.18(6)
KXY	34.84-37.41	6.5	0.024(8)
$\Sigma I_{e_{AK}}$			0.58(18) %

$E_{e_{AL}}$, keV	$\Sigma I_{e_{AL}}$, %
2.6-5.9	9.3(9)

$^{133}_{56}Ba_{77}$

γ, X, e^-, e

$T_{1/2}$	10.56(3) a
Q_c	520.5(30) keV

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	53.1615(14)	3.55(3)	2.203(19)
γ_2	79.616(3)	4.05(12)	2.51(8)
γ_3	80.9966(12)	54.7(6)	34.0(4)
γ_4	160.614(2)	1.036(13)	0.643(8)
γ_5	223.237(2)	0.718(7)	0.446(5)
γ_6	276.3976(14)	11.53(6)	7.15(4)
γ_7	302.8529(13)	29.57(15)	18.35(9)
γ_8	356.0142(13)	100	62.06(8)
γ_9	383.8513(18)	14.41(7)	8.94(5)

$\langle E_\gamma \rangle$	266.56(32) keV
$\langle\langle E_\gamma \rangle\rangle$	363.3(6) keV/decay
ΣI_γ	136.3(4) %

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	30.625	54.1(11)	34.9(10)
K_{α_1}	30.973	100	64.5(19)
$K_{\beta'_1}$	34.967	28.9(6)	18.6(6)
$K_{\beta'_2}$	36.006	7.0(2)	4.5(2)

ΣI_{XK}	122.5(40) %
$\Sigma I_{\gamma+XK}$	259(4)
$\langle E_{\gamma+XK} \rangle$	156(3) keV
$\langle\langle E_{\gamma+XK} \rangle\rangle$	404(2) keV/decay
$\Gamma_{\gamma+XK}$	2.93(9) $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$
$\Gamma_{\delta=30}$	19.2(6) $aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$

X_{L_i}	E_{XL_i}, keV	I_{XL_i}, %
L_1	3.795	0.25(2)
L_η	4.142	0.12(1)
L_α	4.285	6.9(7)
L_β	4.728	6.7(7)
L_γ	5.389	0.94(10)
ΣI_{XL_i}		15(2)%

KBK

γ_i	σL	α_K	α_L	α_n
γ_1	M1+E2	4.87(15)	0.71(3)	5.77(17)
γ_2	M1+E2	1.46(10)	0.22(2)	1.75(12)
γ_3	M1+E2	1.29(6)	0.21(1)	1.63(6)
γ_4	M1+E2	0.233(10)	0.045(3)	0.293(10)
γ_5	M1+E2	0.081(6)	0.0104(13)	0.095(6)
γ_6	E2	0.047(3)	0.0087(7)	0.059(3)
γ_7	M1+E2	0.037(2)	0.0054(4)	0.044(2)
γ_8	E2	0.0211(6)	0.0035(2)	0.0258(6)
γ_9	E2	0.0169(9)	0.027(2)	0.0205(10)

e_i	E_{e_i}, keV	I_{e_i}, %
$K(\gamma_1)$	17.1769(14)	10.7(3)
$K(\gamma_2)$	43.631(3)	3.7(3)
$K(\gamma_3)$	45.0120(12)	43.9(20)
$L(\gamma_1)$	47.45-48.15	1.56(7)
$MN+(\gamma_1)$	51.95-53.15	0.43(2)
$L(\gamma_2)$	73.90-74.60	0.55(6)
$L(\gamma_3)$	75.28-75.98	7.1(4)
$MN+(\gamma_2)$	78.40-79.60	0.15(2)
$MN+(\gamma_3)$	79.78-80.98	1.9(2)

$K(\gamma_4)$	124.629(2)	0.15(1)
$L(\gamma_4)$	154.90-155.60	0.029(2)
$K(\gamma_5)$	187.252(2)	0.036(3)
$K(\gamma_6)$	240.4130(14)	0.34(2)
$K(\gamma_7)$	266.8683(13)	0.68(4)
$L(\gamma_6)$	270.69-271.39	0.062(6)
$MN+(\gamma_6)$	275.18-276.38	0.016(2)
$L(\gamma_7)$	297.14-297.84	0.099(8)
$MN+(\gamma_7)$	301.64-302.84	0.024(2)
$K(\gamma_8)$	320.0296(13)	1.31(4)
$K(\gamma_9)$	347.8667(18)	0.15(1)
$L(\gamma_8)$	350.30-351.00	0.22(1)
$MN+(\gamma_8)$	354.80-356.00	0.056(5)
$L(\gamma_9)$	378.14-378.84	0.024(2)

e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$, %
KLL	24.41-25.80	100	9.1(6)
KLX	29.00-30.96	46.8	4.3(3)
KXY	33.55-35.96	6.4	0.6(1)
$\Sigma I_{e_{AK}}$			14.0(9) %
$\Sigma I_{e+e_{AK}}$			90(4)%
	$\langle E_{e+e_{AK}} \rangle$	47(1)	keV
	$\langle\langle E_{e+e_{AK}} \rangle\rangle$	42(1)	keV/decay

$^{144}_{58}Ce_{86}$

β^-, γ, X, e^-

$T_{1/2}$	285.0(11) days
Q_β	318.6(20) keV

β_i	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i}, %
β_1	110.3(20)		$4.0(4)\cdot10^{-4}$
β_2	185.1(20)	50.3(6)	19.8(3)
β_3	238.5(20)	66.2(6)	3.8(3)
β_4	318.6(20)	91.2(7)	76.4(4)
β_5	474.1(20)		$1.3(4)\cdot10^{-4}$
β_6	1545.3(20)	-	$<3\cdot10^{-4}$
$\langle E_\beta \rangle$			82.2(6) keV

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	33.568(10)	2.26(23)	0.251(26)
γ_2	40.981(10)	3.6(3)	0.40(3)
γ_3	53.395(5)	0.89(5)	0.099(6)
γ_4	59.03(3)	0.0089(5)	0.00097(5)
γ_5	80.120(5)	12.1(7)	1.34(9)
γ_6	99.961(15)	0.355(20)	0.39(2)
γ_7	133.517(1)+	100	11.09(16)
ΣI_{γ_i}			13.2(2) %

X_{K_i} (Pr)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	35.550	54.8(11)	2.32(9)
K_{α_1}	36.026	100	4.19(14)
$K_{\beta'_1}$	40.653-41.050	29.9(6)	1.21(5)
$K_{\beta'_2}$	41.764-41.877	7.9(2)	0.259(10)
ΣI_{XK_i}			8.00(18) %

X_{L_i} (Pr)	E_{XL_i}, keV	I'_{XL_i}	I_{XL_i}, %
L_α	5.01(5)	5.4(9)	0.60(10)
L_β	5.49(5)	6.9(9)	0.77(13)
L_γ	6.30-6.59	1.4(3)	0.16(3)
ΣI_{XL_i}			1.53(16) %
$\Sigma I_{\gamma+XK}$			21.2(3) %
	$\langle E_{\gamma+XK} \rangle$	90.4(6) keV	
	$\langle\langle E_{\gamma+XK} \rangle\rangle$	19.16(23) keV/decay	

$\Gamma_{\gamma+XK}$	0.120(5)	$R\cdot cm^2\cdot h^{-1}\cdot mCi^{-1}$
$\Gamma_{\delta=30}$	0.787(31	$aGy\cdot m^2\cdot s^{-1}\cdot Bq^{-1}$

KBK

γ_i	σL	α_K	α_L	α_M	α_Π
γ_1	M1		3.74	0.785	4.79
γ_2	M1(+E2)		2.10	0.440	2.69
γ_3	M1	6.87	0.956	0.200	8.09
γ_4	M3	421	632	157	1260
γ_5	M1	2.12	0.293	0.0614	2.49
γ_6	E2	1.23	0.716	0.160	2.14
γ_7	M1	0.493	0.0677	0.0142	0.580

γ_i	e_i	E_{e_i}, keV	I'_{e_i}	I_{e_i}, %
γ_1	L1	26.733(10)	14.8(12)	0.94(10)
	L2	27.128(10)	0.94(7)	
	M1	32.057(10)	2.7(2)	0.197(19)
γ_2	L1	34.15(10)	12.9(15)	0.84(6)
	L2	34.54(10)	1.1(4)	0.84(6)
	M1	39.47(10)	2.7(4)	0.176(13)
	M2	39.64(10)	0.4(4)	0.176(13)
γ_3	K	11.404(5)		0.68(4)
	L1	46.560(5)	1.90(19)	0.095(6)
	L2	46.955(5)	0.15(10)	0.095(6)
	M1	51.884(5)	0.46(18)	0.0198(10)
γ_4	K	17.04(3)	7.5(3)	0.410(15)
	L1	52.20(3)	4.16(26)	0.613(23)
	L2	52.59(3)	0.73(18)	0.613(23)
	L3	53.07(3)	6.42(28)	0.613(23)
	M1	57.52(3)	1.21(10)	0.152(8)
	M3	57.79(3)	1.74(13)	0.152(8)
γ_5	K	38.129(5)	62.9(19)	2.84(19)
	L1	73.285(5)	7.8(3)	0.39(3)
	L2	73.680(5)	0.52(21)	0.39(3)
	M1	78.609(5)	1.7(6)	0.08(1)
γ_6	K	57.970(15)	1.09(10)	0.047(2)
	L1	93.126(15)	0.12(5)	0.028(1)
	L2	93.521(15)	0.22(5)	0.028(1)
	L3	93.997(15)	0.23(5)	0.028(1)
γ_7	K	91.526(1)	100(2)	5.47(9)
	L1	126.682(1)	12.8(4)	0.751(13)
	L2	127.077(1)	0.95(5)	0.751(13)
	L3	127.553(1)	0.23(6)	0.751(13)
	M1	132.006(1)	2.94(20)	0.157(3)
$\langle E_e \rangle$				68.0(5) keV

$^{144}_{59}Pr_{85}$

β^-, γ, X, e^-

$T_{1/2}$ 17.28(3) min

Q_β 2996.9(30) keV

β_i	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i}, %
β_1	154(3)		$1.1(3)\cdot10^{-4}$
β_2	254(3)		$2.7(4)\cdot10^{-4}$
β_3	321(3)		$8.7(7)\cdot10^{-4}$
β_4	342(3)	98.5(10)	$1.5(4)\cdot10^{-4}$
β_5	629(3)		$\approx 3\cdot10^{-4}$
β_6	811(3)	266.6(12)	1.05(1)
β_7	912(3)	306.2(12)	$6.7(1)\cdot10^{-3}$
β_8	924(3)		$6.0(5)\cdot10^{-4}$
β_9	1436(3)	522.5(13)	$1.5(3)\cdot10^{-3}$
β_{10}	2300(3)	904.0(13)	1.03(2)
β_{11}	2997(3)	1221.4(14)	97.91(2)
$\langle E_\beta \rangle$			1208.0(15) keV

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	617.8(2)	0.16(5)	$2.2(7)\cdot10^{-4}$
γ_2	624.7(1)	0.84(2)	$1.13(3)\cdot10^{-4}$
γ_3	674.95(10)	2.09(15)	$2.80(20)\cdot10^{-4}$
γ_4	696.510(9)	1000	1.342(13)
γ_5	814.10(10)	2.4(2)	$3.22(27)\cdot10^{-4}$
γ_6	864.45(10)	1.8(2)	$2.42(27)\cdot10^{-4}$
γ_7	1182.0(3)	0.04	$5\cdot10^{-5}$
γ_8	1376.27(10)	0.29(2)	$3.9(3)\cdot10^{-4}$
γ_9	1388.02(10)	5.01(4)	$6.72(9)\cdot10^{-4}$
γ_{10}	1489.160(5)	219(7)	0.294(10)
γ_{11}	1560.97(10)	0.15(2)	$2.01(27)\cdot10^{-4}$
γ_{12}	1631.36(10)	0.30(3)	$4.0(4)\cdot10^{-4}$
γ_{13}	1885.3(2)	0.10(3)	$1.3(4)\cdot10^{-4}$
γ_{14}	1978.82(10)	0.68(5)	$9.1(7)\cdot10^{-4}$
γ_{15}	2046.3(2)	0.20(3)	$2.7(4)\cdot10^{-4}$
γ_{16}	2072.9(10)	0.17(2)	$2.3(3)\cdot10^{-4}$
γ_{17}	2185.662(7)	559(7)	0.75(1)
γ_{18}	2368.3(3)	0.036(3)	$4.5(9)\cdot10^{-5}$
γ_{19}	2654.9(2)	0.14(3)	$1.8(4)\cdot10^{-4}$
γ_{20}	2842.9(10)	0.08(2)	$1.1(3)\cdot10^{-4}$
ΣI_{γ_i}			2.39(2) %

$\langle E_\gamma \rangle$	1261(9) keV
$\langle\langle E_\gamma \rangle\rangle$	30.34(28) keV/decay
Γ_γ	0.144(6) $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$
$\Gamma_{\delta=30}$	0.946(36) $aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$

KBK

γ_i	σL	α_K	α_L	α_Π
γ_4	E2	$4.27 \cdot 10^{-3}$	$6.32 \cdot 10^{-4}$	$5.12 \cdot 10^{-3}$
γ_{10}	E1	$3.96 \cdot 10^{-4}$	$4.92 \cdot 10^{-5}$	$4.55 \cdot 10^{-4}$
γ_{17}	E1	$2.10 \cdot 10^{-4}$	$2.65 \cdot 10^{-5}$	$2.42 \cdot 10^{-4}$

γ_i	e_i	E_{e_i}, keV	I_{e_i}, %
γ_4	K	652.944(3)	$5.78(8) \cdot 10^{-3}$
	L	689.38-690.30	$8.86(12) \cdot 10^{-4}$
	M	694.94-695.63	$1.74(3) \cdot 10^{-4}$
γ_4	ΣI_{e_i}		$6.88(23) \cdot 10^{-3}$ %
γ_{10}	K	1445.591(5)	$1.17(6) \cdot 10^{-4}$
γ_{17}	K	2142.093(7)	$1.58(7) \cdot 10^{-4}$
$\langle E_e \rangle$			700.5(6) keV

$^{147}_{61}Pm_{86}$

β^-, γ, X, e^-

$T_{1/2}$	2.6234(2) a
Q_β	224.6(4) keV

β_i	E_{β_i}, keV	I_{β_i}, %
β_1	27.2(4)	$4.8(8) \cdot 10^{-7}$
β_2	103.3(4)	$5.9(2) \cdot 10^{-3}$
β_3	224.6(4)	99.9441(2)
$\langle E_\beta \rangle$		62.1(2) keV

γ_i	E_{γ_i}, keV	I_{γ_i}, %
γ_1	76.14(4)	$1.0(3) \cdot 10^{-6}$
γ_2	121.26(4)	$2.9(1) \cdot 10^{-3}$
γ_3	197.39(4)	$3.5(6) \cdot 10^{-7}$

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	39.522	55.2(11)	$3.2(3) \cdot 10^{-3}$
K_{α_1}	40.118	100	$5.9(6) \cdot 10^{-3}$
K_β	45.9	38.8(8)	$2.3(2) \cdot 10^{-3}$
$\Sigma I_{\gamma+XK}$			0.014(1) %
	$\langle E_{\gamma+XK} \rangle$	57.4(9) keV	
	$\langle\langle E_{\gamma+XK} \rangle\rangle$	8.2(2) keV/decay	
$\Gamma_{\gamma+XK}$	$6.9(4) \cdot 10^{-5}$	$R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$	
$\Gamma_{\delta=30}$	$4.5(3) \cdot 10^{-4}$	$aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$	

E_{XL}, keV	ΣI_{XL}, %
4.99-7.71	0.039(4)

KBK

γ_i	σL	α_K	α_L	α_Π
γ_2	M1+E2	0.826(3)	0.148(5)	1.051(12)

	e_i	E_{e_i}, keV	I_{e_i}, %
γ_1	K	74.43(4)	$2.4(1) \cdot 10^{-3}$
	L	113.52-114.54	$4.3(2) \cdot 10^{-3}$
for γ_1	ΣI_{e_i}		$3.0(1) \cdot 10^{-3}$ %

$^{152}_{63}Eu_{89}$

$\beta^-, \beta^+, \gamma, X, e$

$T_{1/2}$			13.537(11) a
Q_{β^-}	1822.1(18) keV	Q_{β^+}	1876.1(9) keV
ΣI_{β^-}	27.9(7) %	ΣI_{β^+}	$1.39(25)\cdot10^{-2}$ %
$\Sigma I_{\beta^+ + \varepsilon}$	72.1(7) %		

β_i^+	$E_{\beta_i^+}$, keV	$I_{\beta_i^+}$, %
β_1^+	487.6(9)	$2.9(5)\cdot10^{-3}$
β_2^+	732.3(9)	$1.10(25)\cdot10^{-2}$

β_i^-	$E_{\beta_i^-}$, keV	$\langle E_{\beta_i^-}\rangle$, keV	$I_{\beta_i^-}$, %
β_1^-	129.7(9)	34.3(2)	0.017(2)
β_2^-	178.7(9)	48.3(2)	1.81(7)
β_3^-	216.5(9)	59.5(2)	0.10(3)
β_4^-	272.0(9)	80.3(2)	0.031(5)
β_5^-	387.9(9)	113.3(2)	2.37(9)
β_6^-	539.8(9)	165.1(3)	0.025(7)
β_7^-	698.9(9)	223.0(3)	13.53(15)
β_8^-	712.9(9)	227.4(3)	0.23(6)
β_9^-	891.5(9)	296.2(4)	0.30(5)
β_{10}^-	1066.7(9)	365.8(4)	0.89(8)
β_{11}^-	1477.8(9)	534.8(4)	8.6(6)

γ_i	E_{γ_i}, keV	I_{γ_i}	I_{γ_i}, %
γ_1	121.7824(4)	107.4(4)	28.55(27)
γ_2	148.028(7)	0.14(2)	0.037(5)
γ_3	207.6(2)	0.03(1)	0.008(3)
γ_4	209.3(3)	0.025(10)	0.0066(26)
γ_5	212.5(3)	0.08(2)	0.021(5)
γ_6	237.0(3)	0.04(2)	0.010(5)
γ_7	244.6989(10)	28.37(12)	7.54(7)
γ_8	251.635(10)	0.253(25)	0.067(7)
γ_9	269.4(7)	0.012(5)	0.0032(13)
γ_{10}	271.04(6)	0.274(14)	0.073(4)
γ_{11}	275.387(6)	0.126(4)	0.0335(11)
γ_{12}	295.921(7)	1.64(2)	0.436(7)
γ_{13}	315.26(10)	0.15(3)	0.040(8)
γ_{14}	316.3(4)	0.023(9)	0.0061(24)
γ_{15}	324.85(9)	0.273(14)	0.073(4)
γ_{16}	329.43(6)	0.461(7)	0.123(3)
γ_{17}	340.5(3)	0.023(6)	0.0061(16)
γ_{18}	344.2810(8)	100.0(3)	26.58(23)
γ_{19}	351.7(6)	0.061(10)	0.016(3)
γ_{20}	367.797(4)	3.23(3)	0.859(16)
γ_{21}	385.7(6)	0.085(38)	0.023(10)
γ_{22}	411.126(3)	8.40(4)	2.23(3)
γ_{23}	416.07(9)	0.389(20)	0.103(6)
γ_{24}	443.949(15)	10.53(12)	2.80(3)
γ_{25}	443.977(15)	1.21(12)	0.32(3)
γ_{24+25}	443.971(3)	11.74(4)	3.12(3)
γ_{26}	482.6(2)	0.11(3)	0.029(8)
γ_{27}	488.684(6)	1.560(20)	0.415(8)
γ_{28}	493.6(3)	0.127(10)	0.034(3)
γ_{29}	496.4(3)	0.030(15)	0.008(4)
γ_{30}	503.470(9)	0.570(20)	0.152(6)
γ_{31}	520.24(3)	0.21(2)	0.056(6)
γ_{32}	523.2(3)	0.026(8)	0.0069(22)
γ_{33}	527.0(3)	0.039(11)	0.010(3)
γ_{34}	534.30(11)	0.023(6)	0.041(8)
γ_{35}	535.4(4)	0.023(6)	0.0061(16)
γ_{36}	556.6(5)	0.07(2)	0.019(6)
γ_{37}	561.4(8)	0.010(6)	0.0026(16)
γ_{38}	563.997(7)	1.85(3)	0.492(9)
γ_{39}	566.439(12)	0.482(8)	0.128(3)
γ_{40}	586.273(9)	1.74(4)	0.462(11)
γ_{41}	615.406(11)	(E0)	-
γ_{42}	616.2(3)	0.037(12)	0.010(3)
γ_{43}	644.2(4)	0.025(7)	0.007(2)
γ_{44}	656.492(5)	0.539(8)	0.143(3)
γ_{45}	664.6(4)	0.029(7)	0.0077(20)
γ_{46}	671.458(18)	0.054(21)	0.014(6)
γ_{47}	674.670(19)	0.58(5)	0.154(15)
γ_{48}	674.960(35)	0.12(4)	0.032(11)
γ_{47+48}	674.685(7)	0.70(3)	0.186(9)
γ_{49}	678.623(5)	1.777(22)	0.472(9)
γ_{50}	686.7(4)	0.12(4)	0.032(10)
γ_{51}	688.674(5)	3.14(3)	0.834(16)
γ_{52}	703.6(7)	0.057(17)	0.015(5)
γ_{53}	712.92(10)	0.35(3)	0.093(8)

γ_{54}	719.347(4)	1.04(7)	0.276(19)
γ_{55}	719.361(4)	0.22(6)	0.058(16)
γ_{54+55}	719.355(6)	1.260(23)	0.335(7)
γ_{56}	728.1(3)	0.036(7)	0.0096(20)
γ_{57}	764.90(12)	0.675(30)	0.179(9)
γ_{58}	769.06(16)	0.281(20)	0.075(6)
γ_{59}	778.925(13)	48.73(23)	12.95(13)
γ_{60}	794.7(6)	0.097(10)	0.026(3)
γ_{61}	805.2(10)	0.05(1)	0.013(3)
γ_{62}	810.458(9)	1.195(16)	0.317(5)
γ_{63}	839.6(4)	0.06(3)	0.016(8)
γ_{64}	841.578(10)	0.608(8)	0.162(3)
γ_{65}	867.384(8)	16.04(15)	4.26(5)
γ_{66}	901.02(10)	0.330(24)	0.088(7)
γ_{67}	919.369(19)	1.51(5)	0.401(13)
γ_{68}	926.29(6)	1.00(3)	0.266(8)
γ_{69}	930.64(15)	0.25(3)	0.066(9)
γ_{70}	936.8(9)	0.008(3)	0.0021(8)
γ_{71}	958.9(3)	0.05(2)	0.013(5)
γ_{72}	963.360(10)	0.44(8)	0.12(2)
γ_{73}	964.065(6)	54.56(15)	14.50(17)
γ_{72+73}	964.065(6)	55.00(15)	14.62(17)
γ_{74}	974.2(3)	0.04(1)	0.010(3)
γ_{75}	990.0(3)	0.122(20)	0.032(6)
γ_{76}	1005.18(3)	2.408(19)	0.640(11)
γ_{77}	1085.864(11)	38.11(13)	10.13(9)
γ_{78}	1089.767(14)	6.54(3)	1.738(23)
γ_{79}	1109.0(5)	0.78(4)	0.207(13)
γ_{80}	1112.089(10)	50.94(16)	13.54(13)
γ_{81}	1171.0(2)	0.13(3)	0.035(8)
γ_{82}	1206.0(4)	0.029(8)	0.0077(22)
γ_{83}	1212.970(3)	5.31(4)	1.411(16)
γ_{84}	1249.95(7)	0.681(19)	0.181(7)
γ_{85}	1261.3(2)	0.138(20)	0.037(6)
γ_{86}	1292.76(12)	0.373(20)	0.099(6)
γ_{87}	1299.152(9)	6.13(4)	1.629(24)
γ_{88}	1314.9(5)	0.015(5)	0.0040(14)
γ_{89}	1334.3(10)	0.004(2)	0.0010(5)
γ_{90}	1348.1(3)	0.064(8)	0.017(2)
γ_{91}	1363.9(3)	0.103(10)	0.027(2)
γ_{92}	1390.3(2)	0.016(5)	0.043(14)
γ_{93}	1408.013(6)	78.53(12)	20.87(18)
γ_{94}	1457.620(21)	1.868(13)	0.497(11)
γ_{95}	1528.21(10)	1.047(12)	0.278(6)
γ_{96}	1538.2(8)	0.0072(20)	0.0019(5)
γ_{97}	1558.2(10)	0.003(1)	0.0008(3)
γ_{98}	1605.6(2)	0.0031(6)	0.0082(16)
γ_{99}	1608.7(2)	0.021(5)	0.006(2)
γ_{100}	1647.3(2)	0.024(5)	0.007(2)
γ_{101}	1768.9(2)	0.033(3)	0.0088(9)
ΣI_{γ_i}			159.0(6) %
$\langle E_\gamma \rangle$	709.4(26) keV		
$\langle\langle E_\gamma \rangle\rangle$	1128(4) keV/decay		

X_{K_i} (Sm)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	39.5224(1)	55.2(11)	21.1(5)
K_{α_1}	40.1181(1)	100	38.1(9)
K_β	49.29-46.58	38.8(8)	14.8(4)
ΣI_{XK_i} (Sm)			74.0(11) %

X_{K_i} (Gd)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	42.3089(1)	55.6(11)	0.25(2)
K_{α_1}	42.9962(1)	100	0.45(3)
K_β	48.56-49.96	39.7(8)	0.18(2)
ΣI_{XK_i} (Gd)			0.83(3) %
ΣI_{XK_i} (Sm+Gd)			74.8(11) %
$\Sigma I_{\gamma+XK}$			233.8(13) %
$\langle E_{\gamma+XK} \rangle$	498.1(18) keV		
$\langle\langle E_{\gamma+XK} \rangle\rangle$	1164.6(40) keV/decay		
$\Gamma_{\gamma+XK}$	6.47(35)	$R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$	
$\Gamma_{\delta+30}$	42.4(23)	$aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$	

X_{L_i}	E_{XL_i}, keV	I_{XL_i}, %
L_1 (Sm)	4.931(5)	0.310(15)
L_α(Sm)+$L_{1\eta}$(Gd)	5.585(5)	6.88(29)
$L_{\eta\beta}$(Sm)+L_α(Gd)	6.19-6.52	6.25(29)
L_γ(Sm)+L_β(Gd)	7.17-7.41	0.86(4)
ΣI_{XL}		14.3(5) %

$\langle E_{XL} \rangle$ 5.96(21) keV

$\langle\langle E_{XL} \rangle\rangle$ 0.85(3) keV/decay

KBK

γ_i^z	σL	α_K	α_L	α_M	α_Π
γ_1^{62}	E2	0.672	0.373	0.0856	1.150
γ_2^{62}	M1	0.480	0.0675	0.0144	0.570
γ_7^{62}	E2	0.0804	0.0208	$4.65 \cdot 10^{-3}$	0.1069
γ_8^{62}	E1	0.0196	$2.69 \cdot 10^{-3}$	$5.71 \cdot 10^{-4}$	0.023
γ_{10}^{64}	E2	0.0623	0.0142	$3.65 \cdot 10^{-3}$	0.0811
γ_{11}^{62}	E2	0.0565	0.0134	$2.97 \cdot 10^{-3}$	0.0736
γ_{12}^{62}	E1	0.0130	$1.76 \cdot 10^{-3}$	$3.74 \cdot 10^{-4}$	0.0152
γ_{13}^{64}	E2	0.0399	$9.29 \cdot 10^{-3}$	$2.09 \cdot 10^{-3}$	0.0518
γ_{15}^{64}	M1	0.0668	$9.44 \cdot 10^{-3}$	$2.03 \cdot 10^{-3}$	0.0788
γ_{16}^{62}	E1	$9.94 \cdot 10^{-3}$	$1.34 \cdot 10^{-3}$	$2.84 \cdot 10^{-4}$	0.0116
γ_{18}^{64}	E2	0.0309	$6.82 \cdot 10^{-3}$	$1.52 \cdot 10^{-3}$	0.0396
γ_{20}^{64}	E1	$8.21 \cdot 10^{-3}$	$1.13 \cdot 10^{-3}$	$2.42 \cdot 10^{-4}$	$9.64 \cdot 10^{-3}$
γ_{22}^{64}	E2	0.0189	$3.76 \cdot 10^{-3}$	$8.35 \cdot 10^{-3}$	0.0237
γ_{24}^{62}	E1	$4.85 \cdot 10^{-3}$	$6.45 \cdot 10^{-4}$	$1.50 \cdot 10^{-4}$	$5.69 \cdot 10^{-3}$
γ_{25}^{62}	E2	0.0148	$2.67 \cdot 10^{-3}$	$5.84 \cdot 10^{-4}$	0.0182
γ_{27}^{62}	M1	0.0198	$2.69 \cdot 10^{-3}$	$5.73 \cdot 10^{-4}$	0.0232
γ_{30}^{64}	M1	0.021.5	$2.99 \cdot 10^{-3}$	$6.43 \cdot 10^{-4}$	0.0253
γ_{31}^{64}	M1	0.019.6	$2.75 \cdot 10^{-3}$	$5.91 \cdot 10^{-4}$	0.0233
γ_{38}^{62}	E1	$2.84 \cdot 10^{-3}$	$3.71 \cdot 10^{-4}$		$3.30 \cdot 10^{-3}$
γ_{39}^{62}	M1	0.0137	$1.85 \cdot 10^{-3}$		0.016
γ_{40}^{64}	E2+E0	0.0246(2)	$4.1(4) \cdot 10^{-3}$		0.030(3)
γ_{44}^{62}	M1+E2	0.051(5)	$8(2) \cdot 10^{-3}$		0.061(6)
γ_{49}^{64}	M1	0.010.2	$1.40 \cdot 10^{-3}$		0.012
γ_{51}^{62}	E2+E0	0.0388(13)	$8(2) \cdot 10^{-3}$		0.0489(16)
γ_{54}^{62}	E1	$1.69 \cdot 10^{-3}$	$2.19 \cdot 10^{-4}$		$1.90 \cdot 10^{-3}$
γ_{55}^{62}	E2	$4.33 \cdot 10^{-3}$	$6.58 \cdot 10^{-4}$		$5.15 \cdot 10^{-3}$
γ_{59}^{64}	E1	$1.58 \cdot 10^{-3}$	$2.08 \cdot 10^{-4}$		$1.84 \cdot 10^{-3}$
γ_{65}^{62}	E2	$3.80 \cdot 10^{-3}$	$4.71 \cdot 10^{-4}$		$4.37 \cdot 10^{-3}$
γ_{72}^{62}	E1	$9.44 \cdot 10^{-4}$	$1.22 \cdot 10^{-4}$		$1.10 \cdot 10^{-3}$
γ_{73}^{62}	E2	$2.28 \cdot 10^{-3}$	$3.23 \cdot 10^{-4}$		$2.68 \cdot 10^{-3}$
γ_{76}^{62}	M1	$2.70 \cdot 10^{-3}$	$4.50 \cdot 10^{-4}$		$3.26 \cdot 10^{-3}$
γ_{77}^{62}	E2	$1.78 \cdot 10^{-3}$	$2.47 \cdot 10^{-4}$		$2.09 \cdot 10^{-3}$
γ_{78}^{64}	E2	$1.94 \cdot 10^{-3}$	$2.78 \cdot 10^{-4}$		$2.29 \cdot 10^{-3}$
γ_{80}^{62}	E2	$1.69 \cdot 10^{-3}$	$2.34 \cdot 10^{-4}$		$1.98 \cdot 10^{-3}$
γ_{83}^{62}	E1	$6.24 \cdot 10^{-4}$	0.0796		$7.24 \cdot 10^{-4}$
γ_{87}^{64}	E1	$6.08 \cdot 10^{-4}$	0.0783		$7.06 \cdot 10^{-4}$
γ_{93}^{62}	E1	$4.81 \cdot 10^{-4}$	0.0610		$5.57 \cdot 10^{-4}$

γ_i	e_i	E_{e_i}, keV	I_{e_i}'	I_{e_i}, %
γ_1	K	74.9482(9)	2335(34)	19.17(28)
	L	114.0456-115.0662	1300(26)	10.67(21)
	M	120.0596-120.3627	298(9)	2.45(7)
	N	121.437-121.534	67(3)	0.55(3)
γ_2	K	101.194(8)	2.2(3)	0.018(3)
γ_7	K	197.8647(15)	73.8(8)	0.606(7)
	L	236.9621-297.9827	19.1(3)	0.157(3)
	M	242.9761-243.2791	4.27(7)	0.0351(6)
γ_8	K	204.798(10)	0.16(2)	0.0013(2)
γ_{10}	K	220.80(4)	0.55(3)	0.0045(3)
γ_{11}	K	228.553(6)	0.230(10)	0.0019(1)
γ_{12}	K	249.102(7)	0.690(8)	0.00566(7)
γ_{13}	K	265.02(10)	0.19(4)	0.0016(4)
γ_{15}	K	274.61(9)	0.590(29)	0.0048(3)
γ_{16}	K	282.60(9)	0.148(4)	0.00122(4)
γ_{18}	K	294.0420(24)	100.0(5)	0.821(16)
	L	335.9055-337.0383	22.0(7)	0.181(5)
	M	342.4003-342.7371	4.9(2)	0.040(2)
	N	343.905-344.010	0.9(1)	0.0074(8)
γ_{20}	K	317.551(4)	0.858(10)	0.00704(8)
	L	359.414-360.547	0.119(6)	0.00098(5)
γ_{22}	K	360.882(3)	5.14(7)	0.0422(6)
	L	402.745-403.878	1.03(5)	0.0085(4)

γ_{24}	M	409.240-409.577	0.226(7)	0.00185(5)
	K	397.115(15)	1.65(5)	0.0135(5)
	L	436.22-437.24	0.22(1)	0.0018(1)
γ_{25}	K	397.143(15)	0.57(8)	0.0047(7)
	L	436.24-437.26	0.111(16)	0.00091(13)
γ_{27}	K	441.850(6)	1.00(2)	0.0082(2)
γ_{30}	K	453.231(9)	0.40(2)	0.0033(2)
γ_{31}	K	472.96(3)	0.134(13)	0.0011(1)
γ_{38}	K	517.163(7)	0.17(3)	0.0014(3)
γ_{39}	K	519.439(2)	0.214(4)	0.00188(5)
γ_{40}	K	536.034(9)	1.38(15)	0.0113(12)
	L	577.89-579.03	0.23(6)	0.0019(6)
γ_{41}	K	565.167(11)	1.09(5)	0.0089(5)
γ_{44}	K	609.658(5)	0.89(4)	0.0073(4)
γ_{49}	K	628.384(5)	0.586(8)	0.00481(10)
γ_{51}	K	641.840(5)	3.94(13)	0.0323(13)
	L	680.93-681.95	0.75(25)	0.0061(21)
γ_{54}	K	672.513(4)	0.057(6)	0.00047(6)
γ_{55}	K	672.527(4)	0.031(10)	0.00025(8)
γ_{59}	K	728.686(13)	2.49(3)	0.0204(5)
	L	770.549-771.682	0.328(6)	0.00269(8)
γ_{65}	K	820.550(8)	1.97(4)	0.0162(5)
	L	859.647-860.668	0.244(8)	0.00200(16)
γ_{72}	K	916.526(10)	0.013(3)	0.00011(3)
γ_{73}	K	917.230(11)	4.02(5)	0.0330(10)
	L	956.327-957.342	0.57(3)	0.0047(3)
γ_{76}	K	958.35(3)	0.210(4)	0.00172(7)
γ_{77}	K	1039.011(11)	2.19(2)	0.0180(4)
	L	1078.109-1079.129	0.304(6)	0.00250(8)
γ_{78}	K	1039.528(11)	0.410(6)	0.00337(8)
	L	1081.392-1082.525	0.059(12)	0.00048(10)
γ_{80}	K	1065.254(10)	2.79(4)	0.0290(7)
	L	1104.352-1105.372	0.385(9)	0.0032(1)
γ_{83}	K	1166.135(13)	1.07(2)	0.00878(27)
γ_{87}	K	1248.913(9)	0.121(3)	0.00099(4)
γ_{93}	K	1361.178(6)	1.222(22)	0.0100(3)
	L	1400.276-1401.296	0.155(5)	0.00127(5)
ΣI_{e_i}				35.2(4) %
$\langle E_e \rangle$		108.1(12) keV		
$\langle\langle E_e \rangle\rangle$		38.1(4) keV/decay		

e_{AK}(Sm)	$E_{e_{AK}}$, keV	$I_{e_{AK}}$, %
KLL	31.199-33.235	3.5(11)
KLX	37.30-40.10	1.8(6)
KXY	43.31-46.79	0.2(1)
$\Sigma I_{e_{AK}}$(Sm)		5.5(13) %

e_{AK}(Gd)	$E_{e_{AK}}$, keV	$I_{e_{AK}}$, %
KLL	33.315-35.579	0.036(12)
KLX	39.90-42.97	0.018(6)
KXY	46.37-50.19	0.0026(10)
$\Sigma I_{e_{AK}}$(Gd)		0.057(14) %
$\Sigma I_{e_{AK}}$(Sm+Gd)		5.6(13) %
$\Sigma I_{e_{AK}+e_i}$		40.8(14) %
$\langle E_{e_{AK}+e_i} \rangle$	98(3) keV	
$\langle\langle E_{e_{AK}+e_i} \rangle\rangle$	40(1) keV/decay	

$^{154}_{63}Eu_{91}$

β^-, γ, X, e

$T_{1/2}$	8.591(5) a
Q_{β^-}	1968.9(16) keV
Q_c	717.0(21) keV
I_c	$1.9(13)\cdot10^{-2}$ %

β_i	E_{β_i}, keV	$\langle E_{\beta_i} \rangle$, keV	I_{β_i}, %
β_1	249.3(17)	69.4(20)	28.2(4)
β_2	308.0(17)	87.2(20)	0.76(2)
β_3	323.0(17)	91.5(20)	0.14(2)
β_4	352.2(17)	100(2)	1.59(3)
β_5	437.5(16)	129(2)	0.49(4)
β_6	571.4(16)	176(2)	35.8(5)
β_7	705.0(16)	230(2)	0.68(6)
β_8	717.3(16)	234(2)	0.28(2)
β_9	841.1(16)	276(2)	17.5(6)

β_{10}	972.6(16)	329(2)	2.7(5)
β_{11}	1153.3(16)	278(2)	0.20(10)
β_{12}	1597.9(16)	598(2)	0.52(28)
β_{13}	1845.8(16)	692(2)	10.0(10)
ΣI_{β_i}			99.981(13) %
$<E_\beta>$			213(2) keV

γ_i	E_{γ_i}, keV	I_{γ_i}	I_{γ_i},%
γ_1	58.4(5)	0.0113(11)	0.0038(4)
γ_2	80.4(4)	0.008(4)	0.0023(12)
γ_3	81.99(2)	0.009(6)	0.0031(21)
γ_4	123.071(3)	116.8(8)	40.5(6)
γ_5	125.39(5)	0.020(6)	0.0069(21)
γ_6	131.576(35)	0.030(1)	0.010(5)
γ_7	134.84(5)	0.020(1)	0.0069(4)
γ_8	146.033(37)	0.078(4)	0.0271(15)
γ_9	156.31(10)	0.028(2)	0.0097(8)
γ_{10}	162.09(5)	0.0028(14)	0.0010(5)
γ_{11}	165.91(5)	0.0065(14)	0.0023(5)
γ_{12}	180.7(1)	0.012(3)	0.0042(10)
γ_{13}	184.72(5)	0.011(3)	0.0038(10)
γ_{14}	188.20(5)	0.0656(23)	0.0228(9)
γ_{15}	195.5(5)	0.006(3)	0.0021(10)
γ_{16}	209.4(5)	0.007(2)	0.024(7)
γ_{17}	219.4(5)	0.0065(22)	0.0023(8)
γ_{18}	229.0(5)	0.0056(22)	0.019(8)
γ_{19}	232.02(5)	0.067(4)	0.0232(15)
γ_{20}	237.0(5)	0.017(11)	0.0059(5)
γ_{21}	247.930(1)	19.79(12)	6.86(11)
γ_{22}	260.9(5)	0.006(3)	0.0021(10)
γ_{23}	267.45(5)	0.039(2)	0.0135(9)
γ_{24}	269.81(5)	0.020(3)	0.0069(10)
γ_{25}	274.0(5)	0.0110(6)	0.0038(2)
γ_{26}	279.9(5)	0.0085(5)	0.0029(2)
γ_{27}	290.0(5)	0.0096(6)	0.0033(2)
γ_{28}	295.7(5)	0.0068(4)	0.0024(2)
γ_{29}	296.0(10)	0.0039(25)	0.0013(9)
γ_{30}	301.26(5)	0.0284(15)	0.0098(6)
γ_{31}	301.1(1)	0.05(2)	0.017(7)
γ_{32}	312.3(1)	0.041(2)	0.0142(7)
γ_{33}	315.4(1)	0.013(2)	0.0045(7)
γ_{34}	320(1)	0.0028(20)	0.0010(7)
γ_{35}	322.02(5)	0.190(9)	0.066(3)
γ_{36}	330.1(3)	0.027(2)	0.0094(8)
γ_{37}	346.73(5)	0.084(4)	0.029(2)
γ_{38}	368.22(5)	0.085(5)	0.029(2)
γ_{39}	370.72(5)	0.015(4)	0.005(2)
γ_{40}	375.2(5)	0.005(3)	0.0017(10)
γ_{41}	382.01(5)	0.0281(15)	0.0098(6)
γ_{42}	397.1(1)	0.082(5)	0.028(2)
γ_{43}	401.258(14)	0.562(20)	0.195(8)
γ_{44}	403.57(5)	0.076(3)	0.026(1)
γ_{45}	414.31(5)	0.014(1)	0.0049(3)
γ_{46}	419.4(5)	0.011(6)	0.004(2)
γ_{47}	444.40(5)	1.577(30)	0.547(12)
γ_{48}	463.9(5)	0.0121(7)	0.0042(3)
γ_{49}	467.93(5)	0.163(7)	0.057(3)
γ_{50}	478.25(5)	0.613(22)	0.213(9)
γ_{51}	480.62(5)	0.0138(7)	0.0048(3)
γ_{52}	483.75(5)	0.0141(7)	0.0049(3)
γ_{53}	484.65(5)	0.0113(6)	0.0039(2)
γ_{54}	488.27(5)	0.020(10)	0.007(4)
γ_{55}	506.4(5)	0.017(6)	0.006(2)
γ_{56}	509.89(5)	0.103(5)	0.035(2)
γ_{57}	512.0(1)	0.10(2)	0.035(7)
γ_{58}	518.02(5)	0.133(6)	0.046(2)
γ_{59}	533.06(14)	0.031(6)	0.011(2)
γ_{60}	535.07(14)	E0	
γ_{61}	545.6(1)	0.047(6)	0.016(2)
γ_{62}	557.58(5)	0.739(24)	0.256(9)
γ_{63}	569.24(5)	0.028(2)	0.010(1)
γ_{64}	581.99(5)	2.54(4)	0.881(19)
γ_{65}	591.762(5)	14.25(7)	4.95(8)
γ_{66}	597.5(5)	0.0158(9)	0.0055(3)
γ_{67}	598.34(30)	0.0172(9)	0.0060(3)
γ_{68}	600.2(5)	0.0170(11)	0.0060(4)
γ_{69}	602.83(5)	0.096(4)	0.033(2)
γ_{70}	613.29(5)	0.266(12)	0.092(4)
γ_{71}	620.54(5)	0.0262(14)	0.0091(5)
γ_{72}	624.4(5)	0.011(5)	0.004(2)
γ_{73}	625.24(5)	0.900(21)	0.312(8)
γ_{74}	649.48(8)	0.214(8)	0.074(3)
γ_{75}	650.6(5)	0.0282(15)	0.0098(5)
γ_{76}	664.7(5)	0.081(4)	0.028(2)
γ_{77}	668.9(5)	0.034(8)	0.012(3)
γ_{78}	676.61(5)	0.413(16)	0.143(6)
γ_{79}	680.72(10)	(E0)	

γ_{80}	692.425(4)	5.12(9)	1.78(4)
γ_{81}	715.79(5)	0.481(23)	0.167(8)
γ_{82}	723.305(5)	57.88(25)	20.1(3)
γ_{83}	756.88(5)	12.92(14)	4.48(8)
γ_{84}	774.4(5)	0.028(4)	0.0097(14)
γ_{85}	790.14(5)	0.028(10)	0.0097(34)
γ_{86}	800.2(5)	0.092(14)	0.032(5)
γ_{87}	815.58(5)	1.44(5)	0.500(18)
γ_{88}	845.42(5)	1.668(21)	0.579(11)
γ_{89}	850.66(5)	0.673(23)	0.234(19)
γ_{90}	873.190(5)	35.05(13)	12.16(18)
γ_{91}	880.63(5)	0.228(10)	0.079(4)
γ_{92}	892.75(5)	1.463(26)	0.508(12)
γ_{93}	898.39(5)	0.056(14)	0.019(5)
γ_{94}	904.07(5)	2.56(4)	0.888(19)
γ_{95}	906.1(5)	0.034(2)	0.0118(7)
γ_{96}	919.26(5)	0.035(2)	0.0121(7)
γ_{97}	924.52(5)	0.166(7)	0.058(3)
γ_{98}	981.3(5)	0.023(6)	0.008(2)
γ_{99}	984.5(5)	0.018(11)	0.006(4)
γ_{100}	996.262(6)	30.08(12)	10.44(16)
γ_{101}	1004.725(7)	51.95(19)	18.03(27)
γ_{102}	1012.8(2)	0.008(4)	0.0028(14)
γ_{103}	1023(1)	0.020(8)	0.007(3)
γ_{104}	1033.4(5)	0.034(2)	0.012(1)
γ_{105}	1047.4(1)	0.141(6)	0.049(2)
γ_{106}	1049.4(1)	0.049(2)	0.0170(7)
γ_{107}	1110(1)	0.008(6)	0.003(2)
γ_{108}	1118.5(1)	0.35(6)	0.12(2)
γ_{109}	1124.2(5)	0.020(3)	0.007(1)
γ_{110}	1128.4(1)	0.76(3)	0.26(1)
γ_{111}	1136.1(5)	0.021(3)	0.07(1)
γ_{112}	1140.9(1)	0.657(14)	0.228(6)
γ_{113}	1153.1(5)	0.039(11)	0.014(4)
γ_{114}	1160.3(3)	0.122(5)	0.0423(18)
γ_{115}	1170.7(5)	0.012(6)	0.004(2)
γ_{116}	1188.6(1)	0.248(14)	0.0086(5)
γ_{117}	1232.1(5)	0.026(17)	0.009(6)
γ_{118}	1241.6(1)	0.371(17)	0.129(6)
γ_{119}	1246.5(1)	2.484(30)	0.862(16)
γ_{120}	1274.436(6)	100.0(3)	34.7(4)
γ_{121}	1290.1(2)	0.0324(14)	0.0112(5)
γ_{122}	1292.0(2)	0.0369(15)	0.0128(5)
γ_{123}	1295.5(2)	0.025(3)	0.009(1)
γ_{124}	1316.5(3)	0.055(10)	0.019(3)
γ_{125}	1400(1)	0.0085(28)	0.0029(10)
γ_{126}	1408.5(2)	0.072(8)	0.025(3)
γ_{127}	1414.6(3)	0.0113(6)	0.0039(2)
γ_{128}	1418.3(3)	0.0208(11)	0.0072(4)
γ_{129}	1419.2(5)	0.0056(3)	0.0019(1)
γ_{130}	1425.9(5)	0.0037(23)	0.0013(8)
γ_{131}	1489.6(2)	0.0085(14)	0.0029(5)
γ_{132}	1494.19(9)	2.032(28)	0.705(14)
γ_{133}	1509.3(5)	0.014(3)	0.005(1)
γ_{134}	1522(1)	0.0017(8)	0.0006(3)
γ_{135}	1531.5(2)	0.017(2)	0.0006(1)
γ_{136}	1537.9(2)	0.0145(6)	0.0050(2)
γ_{137}	1596.59(15)	5.22(4)	1.811(27)
γ_{138}	1667.3(2)	0.0056(8)	0.0019(3)
γ_{139}	1673.8(3)	0.0049(10)	0.0017(4)
γ_{140}	1716.9(5)	0.0017(11)	0.0006(4)
γ_{141}	1773(1)	0.0008(6)	0.0003(2)
γ_{142}	1838.0(5)	0.0022(6)	0.0007(2)
γ_{143}	1895(1)	0.0017(6)	0.0006(2)

ΣI_{γ_i} 165.2(9) %

$\langle E_\gamma \rangle$ 745(3) keV

$\langle\langle E_\gamma \rangle\rangle$ 1231(8) keV/decay

X_{K_i} (Sm)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	42.309(1)	55.6(11)	7.6(2)
K_{α_1}	42.996(1)	100	13.4(4)
K_β	48.555-49.959	39.7(8)	5.4(2)

ΣI_{XK} 26.6(5) %

$\Sigma I_{\gamma+XK}$ 191.8(10) %

$\langle E_{\gamma+XK} \rangle$ 648(3) keV

$\langle\langle E_{\gamma+XK} \rangle\rangle$ 1243(9) keV/decay

$\Gamma_{\gamma+XK}$ 6.7(3) $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$

$\Gamma_{\delta=30}$ 43.9(20) $aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$

KBK

γ_i	σL	α_K	α_L	α_M	α_n
γ_4	E2	0.661	0.414	0.0962	1.195
γ_{14}	E1	0.0453	0.00642	0.00138	0.0532
γ_{21}	E2	0.0813	0.0226	0.00513	0.1095
γ_{43}	E1	0.00669	$9.10 \cdot 10^{-4}$	$1.95 \cdot 10^{-4}$	0.00781
γ_{47}	E2	0.0155	0.00293	$6.50 \cdot 10^{-4}$	0.0191
γ_{50}	M1	0.0245	0.00341	$7.35 \cdot 10^{-4}$	0.0287

γ_i	σL	α_K	α_L	α_n
γ_{62}	E2	$8.65 \cdot 10^{-3}$	$1.49 \cdot 10^{-3}$	0.0105
γ_{64}	E1	$2.88 \cdot 10^{-3}$	$3.85 \cdot 10^{-4}$	$3.36 \cdot 10^{-3}$
γ_{65}	E1	$2.78 \cdot 10^{-3}$	$3.72 \cdot 10^{-4}$	$3.25 \cdot 10^{-3}$
γ_{73}	E2	$6.56 \cdot 10^{-3}$	$1.08 \cdot 10^{-3}$	$7.91 \cdot 10^{-3}$
γ_{78}	E0+E2	0.049(5)	$8.0(8) \cdot 10^{-3}$	0.059(6)
γ_{80}	E0+E2	0.040(4)	$7.0(7) \cdot 10^{-3}$	0.049(5)
γ_{81}	E2	$4.79 \cdot 10^{-3}$	$7.53 \cdot 10^{-4}$	$5.73 \cdot 10^{-3}$
γ_{82}	E1	$1.82 \cdot 10^{-3}$	$2.43 \cdot 10^{-4}$	$2.13 \cdot 10^{-3}$
γ_{83}	97.2%E2+ 2.8%M1	$4.31 \cdot 10^{-3}$	$6.68 \cdot 10^{-4}$	$5.08 \cdot 10^{-3}$
γ_{87}	E2	$3.58 \cdot 10^{-3}$	$5.44 \cdot 10^{-4}$	$4.27 \cdot 10^{-3}$
γ_{88}	E2	$3.31 \cdot 10^{-3}$	$4.98 \cdot 10^{-4}$	$3.94 \cdot 10^{-3}$
γ_{89}	E2	$3.27 \cdot 10^{-3}$	$4.91 \cdot 10^{-4}$	$3.89 \cdot 10^{-3}$
γ_{90}	98.45%E2+ 1.55%M1	$3.13 \cdot 10^{-3}$	$4.67 \cdot 10^{-4}$	$3.72 \cdot 10^{-3}$
γ_{92}	E2	$2.95 \cdot 10^{-3}$	$4.38 \cdot 10^{-4}$	$3.50 \cdot 10^{-3}$
γ_{94}	E1	$1.18 \cdot 10^{-3}$	$1.54 \cdot 10^{-4}$	$1.38 \cdot 10^{-3}$
γ_{100}	E2	$2.34 \cdot 10^{-3}$	$3.40 \cdot 10^{-4}$	$2.77 \cdot 10^{-3}$
γ_{101}	98.65%E2+ 1.35%M1	$2.32 \cdot 10^{-3}$	$3.36 \cdot 10^{-4}$	$2.74 \cdot 10^{-3}$
γ_{108}	E1	$7.92 \cdot 10^{-4}$	$1.03 \cdot 10^{-4}$	$9.21 \cdot 10^{-4}$
γ_{110}	E1	$7.79 \cdot 10^{-4}$	$1.01 \cdot 10^{-4}$	$9.05 \cdot 10^{-4}$
γ_{112}	E2	$1.78 \cdot 10^{-3}$	$2.52 \cdot 10^{-4}$	$2.09 \cdot 10^{-3}$
γ_{118}	E1	$6.56 \cdot 10^{-4}$	$8.49 \cdot 10^{-5}$	$7.62 \cdot 10^{-4}$
γ_{119}	E1	$6.53 \cdot 10^{-4}$	$8.44 \cdot 10^{-5}$	$7.58 \cdot 10^{-4}$
γ_{120}	E1	$6.27 \cdot 10^{-4}$	$8.10 \cdot 10^{-5}$	$7.28 \cdot 10^{-4}$
γ_{132}	E1	$4.77 \cdot 10^{-4}$	$1.62 \cdot 10^{-5}$	$5.53 \cdot 10^{-4}$
γ_{137}	E1	$4.27 \cdot 10^{-4}$	$5.46 \cdot 10^{-5}$	$4.95 \cdot 10^{-4}$

γ_i	e_i	E_{e_i}, keV	I_{e_i}'	I_{e_i}, %
γ_4	K	72.832(3)	$1.94(5) \cdot 10^5$	26.8(7)
	L	114.695-115.829	$1.22(4) \cdot 10^5$	16.8(6)
	M	121.190-121.886	$2.83(12) \cdot 10^4$	3.90(17)
γ_{14}	K	137.96(5)	74.6	$1.03(5) \cdot 10^{-2}$
γ_{21}	K	197.691(1)	$4.04(12) \cdot 10^3$	0.558(16)
	L	239.46-240.60	$1.12(4) \cdot 10^3$	0.155(6)
	M	245.96-246.66	$2.54(11) \cdot 10^3$	0.0351(17)
γ_{43}	K	351.019(14)	9.4(5)	$1.30(7) \cdot 10^{-3}$
γ_{47}	K	394.16(5)	61(2)	$8.48(25) \cdot 10^{-3}$
γ_{50}	K	428.04(5)	37.8(19)	$5.22(26) \cdot 10^{-3}$
γ_{60}	K	484.83(14)	$3.3(3) \cdot 10^2$	$4.7(5) \cdot 10^{-2}$
γ_{62}	K	507.34(5)	16.0(8)	$2.21(11) \cdot 10^{-3}$
γ_{64}	K	531.75(5)	18.4(6)	$2.54(8) \cdot 10^{-3}$
γ_{65}	K	541.523(6)	100.0(5)	$1.38(3) \cdot 10^{-2}$
γ_{73}	K	575.00(5)	14.8(6)	$2.05(8) \cdot 10^{-3}$
γ_{78}	K	626.37(5)	51(5)	$7.0(7) \cdot 10^{-3}$
γ_{79}	K	630.48(10)	35(4)	$4.8(5) \cdot 10^{-3}$
γ_{80}	K	642.186(4)	$5.1(5) \cdot 10^2$	$7.0(7) \cdot 10^{-2}$
γ_{81}	K	665.55(5)	5.8(4)	$8.0(5) \cdot 10^{-4}$
γ_{82}	K	673.066(5)	$2.651(6) \cdot 10^2$	$3.66(9) \cdot 10^{-2}$
	L	714.93-716.07	35.3(12)	$4.88(17) \cdot 10^{-3}$
γ_{83}	K	706.64(5)	$1.40(4) \cdot 10^2$	$1.93(6) \cdot 10^{-2}$
γ_{87}	K	765.34(5)	13.0(6)	$1.79(9) \cdot 10^{-3}$
γ_{88}	K	794.88(5)	13.9(4)	$1.92(6) \cdot 10^{-3}$
γ_{89}	K	800.42(5)	5.54(27)	$7.65(38) \cdot 10^{-4}$
γ_{90}	K	822.951(5)	27.6(7)	$3.81(10) \cdot 10^{-2}$
γ_{92}	K	842.51(5)	10.9(4)	$1.50(5) \cdot 10^{-3}$
γ_{94}	K	853.83(5)	7.61(14)	$1.05(2) \cdot 10^{-3}$
γ_{100}	K	946.023(6)	$1.77(4) \cdot 10^2$	$2.44(6) \cdot 10^{-2}$
γ_{101}	K	954.486(7)	$3.03(7) \cdot 10^2$	$4.18(10) \cdot 10^{-2}$
	L	996.35-997.49	43.9(15)	$6.06(21) \cdot 10^{-3}$
γ_{108}	K	1068.3(1)	0.69(11)	$9.5(16) \cdot 10^{-5}$
γ_{110}	K	1078.2(1)	1.46(7)	$2.02(10) \cdot 10^{-4}$
γ_{112}	K	1090.7(1)	2.94(11)	$4.06(16) \cdot 10^{-4}$
γ_{118}	K	1191.39(5)	0.62(4)	$8.5(5) \cdot 10^{-5}$
γ_{119}	K	1196.29(10)	4.08(12)	$5.63(17) \cdot 10^{-4}$
γ_{120}	K	1224.197(6)	$1.58(4) \cdot 10^2$	$2.18(5) \cdot 10^{-2}$
	L	1266.06-1267.20	20.3(6)	$2.81(8) \cdot 10^{-3}$
γ_{132}	K	1443.95(9)	2.43(7)	$3.36(10) \cdot 10^{-4}$
γ_{137}	K	1546.35(15)	5.60(14)	$7.73(19) \cdot 10^{-4}$

ΣI_e	49.7(9) %
$\langle E_e \rangle$	99.7(35) keV
$\langle\langle E_e \rangle\rangle$	49.6(20) keV/decay

e_{AK}	$E_{e_{AK}}$ keV	$I_{e_{AK}}$, %
KLL	33.315-35.579	1.3(7)
KLX	39.98-42.86	0.6(3)
KXY	47.98-48.91	0.10(5)

$\Sigma I_{e_{AK}}$	1.8(8) %
$\Sigma I_{e_i+e_{AK}}$	51.5(12) %
$\langle E_{e+e_{AK}} \rangle$	97.4(35) keV
$\langle\langle E_{e+e_{AK}} \rangle\rangle$	50.2(20) keV/decay

$^{153}_{64}Gd_{89}$

γ, X, e^-

$T_{1/2}$ 241.6(2) days

Q_ε 483.9(23) keV

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	14.0640(4)	0.146(15)	0.042(4)
γ_2	19.8131(4)	0.072(2)	0.021(1)
γ_3	54.1916(4)	0.058(8)	0.017(2)
γ_4	68.2556(5)	0.071(11)	0.021(2)
γ_5	69.6734(2)	8.48(15)	2.46(7)
γ_6	75.4226(3)	0.28(3)	0.081(8)
γ_7	83.3676(3)	0.68(4)	0.20(2)
γ_8	89.4865(3)	0.22(3)	0.064(9)
γ_9	97.4316(3)	100	29.0(8)
γ_{10}	103.1807(3)	72.4(15)	21.0(6)
γ_{11}	151.6232(6)	0.060(15)	0.017(4)
γ_{12}	172.8541(5)	0.138(13)	0.040(4)

ΣI_{γ_i}	53.0(10) %
$\langle E_\gamma \rangle$	98.28(7) keV
$\langle\langle E_\gamma \rangle\rangle$	52.05(10) keV/decay

X_{K_i}	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	40.902	56.8(12)	34.3(10)
K_{α_1}	41.542	100	60.4(17)
$K_{\beta'_1}$	46.999	31.1(6)	18.8(5)
$K_{\beta'_2}$	48.496	8.0(2)	4.85(14)

ΣI_{XK_i}	118.4(24)%
$\langle E_{XK} \rangle$	42.51(3) keV
$\langle\langle E_{XK} \rangle\rangle$	50.3(9) keV/decay
$\Sigma I_{\gamma+XK}$	171.4(23) %
$\langle E_{\gamma+XK} \rangle$	59.75(32) keV
$\langle\langle E_{\gamma+XK} \rangle\rangle$	102.4(13) keV/decay
$\Gamma_{\gamma+XK}$	.837(27) $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$ } No account taken of γ_1, γ_2 since their energy is less than 30 keV.
$\Gamma_{\delta=30}$	5.49(18) $aGy \cdot m^2 \cdot s^{-1} \cdot Bq^{-1}$ }

KBK

γ_i	σL	α_K	α_L	α_M	α_Π
γ_1	(E1)		8.61	1.90	11.1
γ_2	(E2)		$2.52 \cdot 10^3$	578	$3.29 \cdot 10^3$
γ_5	M1+E	4.5(4)	0.73(7)	0.15	5.4(5)
γ_6	E1	0.51	0.079	0.017	0.61
γ_7	M1+E2	2.37(24)	1.13(11)	0.258(26)	3.8(4)
γ_8	M1+E2	2.16(22)	0.36(3)	0.079(8)	2.63(26)
γ_9	E2	0.258	0.0384	0.0082	0.307
γ_{10}	M1+E2	1.45(14)	0.22(2)	0.0047(5)	1.72(17)
γ_{12}	M1+E2	0.30(3)	0.063(6)	0.014	0.38(4)

e_i	E_{e_i}, keV	I_{e_i}, %
$L(\gamma_1)$	6.01-7.08	0.36(4)
$L(\gamma_2)$	11.76-12.83	53(3)
$MNO(\gamma_1)$	12.26-14.06	0.11(1)
$K(\gamma_5)$	21.1544(4)	11.1(6)
$K(\gamma_6)$	26.9036(5)	0.041(4)
$K(\gamma_7)$	34.8486(5)	0.47(5)
$K(\gamma_8)$	40.9675(5)	0.14(2)
$K(\gamma_9)$	48.9126(5)	7.5(3)
$K(\gamma_{10})$	54.6617(5)	30.5(30)
$L(\gamma_5)$	61.62-62.59	1.8(2)
$L(\gamma_6)$	67.37-68.44	$6.4(7) \cdot 10^{-3}$
$L(\gamma_7)$	75.32-76.39	0.23(2)
$L(\gamma_8)$	81.44-82.51	0.023(2)
$L(\gamma_9)$	89.38-90.45	1.11(4)
$L(\gamma_{10})$	95.13-96.20	4.6(4)
$K(\gamma_{12})$	124.3351(7)	0.012(2)
$L(\gamma_{12})$	164.80-165.87	$2.5(2) \cdot 10^{-3}$

ΣI_{e_i}	111(5) %
$\langle E_e \rangle$	33(2) keV
$\langle\langle E_e \rangle\rangle$	36(2) keV/decay

$^{166m}_{67}Ho_{99}$

β^-, γ, X, e^-

$T_{1/2}$ $1.20(18)\cdot10^3$ a

Q_β 1859.9(11) keV

β_i	E_{β_i}, keV	$\langle E_{\beta_i}\rangle$, keV	I_{β_i}, %
β_1	32.4(11)	8.2(4)	17.7(5)
β_2	73.0(11)	18.8(4)	76.4(22)
β_3	**304.2(11)**	**86.1(4)**	**0.39(2)**
β_4	**483.9(11)**	**145.1(4)**	**0.74(9)**
β_5	**644.0(11)**	**201.5(4)**	**2.26(8)**
β_6	**948.7(11)**	**316.7(4)**	**1.21(4)**
β_7	**1314.5(11)**	**464.4(4)**	**2.99(20)**

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	80.574(8)	17.0(1)	12.5(3)
γ_2	94.694(8)	0.21(1)	0.154(12)
γ_3	119.069(8)	0.238(5)	0.175(9)
γ_4	121.198(9)	0.347(14)	0.255(18)
γ_5	135.282(14)	0.132(3)	0.097(5)
γ_6	140.707(24)	0.060(3)	0.044(4)
γ_7	160.087(14)	0.129(8)	0.095(9)
γ_8	161.775(14)	0.142(4)	0.104(6)
γ_9	184.410(6)	100	73.5(21)
γ_{10}	190.774(23)	0.301(7)	0.221(11)
γ_{11}	214.786(14)	0.606(12)	0.445(22)
γ_{12}	215.89(2)	3.59(3)	2.64(10)
γ_{13}	231.329(19)	0.288(6)	0.212(11)
γ_{14}	255.20(12)	0.0059(13)	0.0043(11)
γ_{15}	259.737(12)	1.50(1)	1.10(4)
γ_{16}	280.459(8)	40.97(14)	30.1(10)
γ_{17}	300.762(9)	5.14(2)	3.78(12)
γ_{18}	304.82(4)	0.030(3)	0.022(3)
γ_{19}	339.74(3)	0.222(8)	0.163(11)
γ_{20}	365.747(12)	3.41(3)	2.51(10)
γ_{21}	410.80(5)	0.023(1)	0.017(1)
γ_{22}	410.944(8)	15.72(11)	11.6(4)
γ_{23}	451.521(4)	4.11(2)	3.02(10)
γ_{24}	464.797(17)	1.67(2)	1.23(5)
γ_{25}	476.37(4)	0.050(3)	0.037(3)
γ_{26}	496.917(21)	0.170(6)	0.125(8)
γ_{27}	520.90(5)	0.220(9)	0.162(11)
γ_{28}	529.801(18)	13.35(8)	9.8(3)
γ_{29}	570.990(23)	7.64(3)	5.62(19)
γ_{30}	590.67(15)	0.032(3)	0.024(3)
γ_{31}	594.43(4)	0.775(9)	0.570(23)
γ_{32}	611.55(3)	1.94(3)	1.43(6)
γ_{33}	615.96(3)	0.132(9)	0.095(9)
γ_{34}	617.0(5)	0.031(9)	0.023(8)
γ_{35}	639.97(4)	0.124(6)	0.091(7)
γ_{36}	644.61(5)	0.192(10)	0.141(11)
γ_{37}	670.502(14)	7.55(4)	5.55(19)
γ_{38}	691.249(14)	1.85(1)	1.36(4)
γ_{39}	706.2(9)	0.025(15)	0.018(11)
γ_{40}	711.683(8)	76.2(3)	56.0(18)
γ_{41}	736.02(8)	0.19(2)	0.14(2)
γ_{42}	736.83(5)	0.34(2)	0.25(2)
γ_{43}	752.285(13)	16.93(6)	12.4(4)
γ_{44}	778.817(10)	4.24(2)	3.12(11)
γ_{45}	785.90(7)	0.023(3)	0.017(2)
γ_{46}	810.276(8)	80.0(3)	58.8(19)
γ_{47}	830.577(12)	13.52(4)	9.9(3)
γ_{48}	875.652(15)	0.995(9)	0.73(3)
γ_{49}	950.967(18)	3.795(12)	2.79(9)
γ_{50}	1010.287(18)	0.106(3)	0.078(5)
γ_{51}	1120.33(2)	0.339(10)	0.249(14)
γ_{52}	1146.84(3)	0.278(6)	0.204(10)
γ_{53}	1241.482(20)	1.116(11)	0.82(3)
γ_{54}	1282.08(2)	0.233(5)	0.171(9)
γ_{55}	1307.30(8)	0.0044(4)	0.0032(5)
γ_{56}	1331.45(14)	0.0051(6)	0.0037(6)
γ_{57}	1400.74(3)	0.708(7)	0.540(22)
γ_{58}	1427.21(4)	0.694(15)	0.51(3)

ΣI_γ 314(9)%

$\langle E_\gamma \rangle$ 516(3) keV

$\langle\langle E_\gamma \rangle\rangle$ kev/decay

X_{K_i} (Er)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	48.22	59.5(21)	11.1(5)
K_{α_2}	49.13	100	18.7(8)
$K_{\beta'_1}$	55.67	30.9(10)	5.78(25)
$K_{\beta'_2}$	56.08	7.64(27)	1.43(7)

$\Sigma I_{\gamma+XK}$	37(1)%
$\langle E_{\gamma+XK}\rangle$	467(4) keV
$\Sigma I_{\gamma+XK}$	351(9)%
$\Gamma_{\gamma+XK}$	9.07(25) $R \cdot cm^2 \cdot h^{-1} \cdot mCi^{-1}$

X_{L_i} (Er)	E_{XL_i}, keV	I'_{XL_i}	I_{XL_i}, %
L_1	6.14	4.8	0.26(4)
L_{α_2}	6.90	11.3	0.62(9)
L_{α_1}	6.95	100	5.5(8)
L_η	7.05	3.3	0.18(3)
$L_\beta+L_\gamma$	7.26-9.75	253	13.9(21)
	$\langle E_{XL}\rangle$	7.69 keV	
	ΣI_{XL}	20.5(25)%	

KBK

γ_i	σL	α_K	α_L	α_M	α_Π
γ_1	E2	1.71	3.95	0.96	6.88
γ_2	E2	0.207	0.097	0.023	0.334
γ_{16}	E2	0.0615	0.0185	0.0043	0.085
γ_{22}	E1	0.0077	0.00105		0.0087
γ_{28}	E2	0.0114	0.0022		0.0144
γ_{40}	E1	0.00225			0.00266
γ_{46}	E2	0.00436			0.0053

	e_i	E_{e_i}, keV	I_{e_i}, %
	$K(\gamma_1)$	23.09	21.4(8)
	$L(\gamma_1)$	70.8-72.2	49.4(21)
	$M(\gamma_1)$	78.4-79.2	12.0(5)
for	γ_1 ΣI_{e_i}	86(4)%	
	$K(\gamma_9)$	126.93	15.2(3)
	$L(\gamma_9)$	174.7-176.1	7.1(2)
	$M(\gamma_9)$	182.2-183.0	1.7(1)
for	γ_9 ΣI_{e_i}	24.5(6)%	
	$K(\gamma_{16})$	222.97	1.85(12)
	$L(\gamma_{16})$	270.7-272.1	0.56(2)
	$M(\gamma_{16})$	278.2-279.0	0.13(1)
for	γ_{16} ΣI_{e_i}	2.6(1)%	
	$K(\gamma_{22})$	353.46	0.089(5)
	$L(\gamma_{22})$	401.2-402.6	0.012(1)
for	γ_{22} ΣI_{e_i}	0.10(1)%	

$\langle E_e\rangle$	83(3) keV		
e_{AK}	$\langle E_{e_{AK}}\rangle$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$ %
KLL	39.2	100	1.34(5)
KLX	46.6	52(1)	0.70(3)
KXY	53.8	7.9(2)	0.11(1)
$\Sigma I_{e_{AK}}$			2.15(9)%
	$\langle E_{e+e_{AK}}\rangle$	82(3) keV	

$^{204}_{81}Tl_{123}$

β^-, X, e_A

$T_{1/2}$	3.784(13) a
Q_{β^-}	763.41(20) keV
Q_ε	346.9(19) keV

E_β	$\langle E_\beta\rangle$, keV	I_β, %
763.41(20)	243.9(1)	97.72(12)
$\langle\langle E_\beta\rangle\rangle$	238.3(1) keV/decay	
I_ε/I_β	0.0233(13)	
$I_{\varepsilon_K}/I_\beta$	0.0156(3)	
$I_{\varepsilon_L}/I_{\varepsilon_K}$	0.50(4)	

X_{K_i} (Hg)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	68.895	58.8(12)	0.43(1)
K_{α_1}	70.819	100	0.72(2)
K_β	80.66	44.1(9)	0.32(1)

ΣI_{XK}	1.47(5)%
$\langle E_{XK} \rangle$	72.4(2) keV
$\langle\langle E_{XK} \rangle\rangle$	1.06(2) keV/decay

$\Gamma_{\gamma+XK}$	$4.92(21) \cdot 10^{-3}$ R·cm²·h⁻¹·mCi⁻¹
$\Gamma_{\delta=30}$	0.0322(14) aGy·m²·s⁻¹·Bq⁻¹

X_{L_i} (Hg)	E_{XL_i}, keV	I_{XL_i}, %
L_1	8.722	0.016(1)
L_{α_2}	9.898	0.040(2)
L_{α_1}	9.988	0.30(1)
L_η	10.647	$3.8(6) \cdot 10^{-3}$
L_β	11.932	0.33(1)
L_γ	13.989	0.056(7)

ΣI_{XL}	0.72(2)%
$\langle E_{XL} \rangle$	11.5(4) keV
$\langle\langle E_{XL} \rangle\rangle$	0.083(3) keV/decay

e_{AK}	$E_{e_{AK}}$, keV	$I'_{e_{AK}}$	$I_{e_{AK}}$ %
KLL	53.18-58.28	100	0.03(1)
KLX	64.59-70.81	55.6(12)	0.02(1)
KXY	75.91-83.09	8.94(18)	0.02(1)

$\Sigma I_{e_{AK}}$	0.05(2)%
$\langle E_{e_{AK}} \rangle$	61(6) keV
$\langle\langle E_{e_{AK}} \rangle\rangle$	0.03(1) keV/decay

$^{207}_{83}Bi_{124}$

β^+, γ, X, e^-

$T_{1/2}$	32.06(25) a
Q_c	2397.8(21) keV

E_{β^+}	$\langle E_{\beta^+} \rangle$, keV	I_{β^+}, %
806.1(21)	386.7(7)	$1.2(2) \cdot 10^{-2}$

$\langle\langle E_{\beta^+} \rangle\rangle$	0.0468 keV/decay

γ_i	E_{γ_i}, keV	I'_{γ_i}	I_{γ_i}, %
γ_1	328.14(8)	$5(4) \cdot 10^{-3}$	$5(4) \cdot 10^{-3}$
γ_2	569.702(2)	100	97.73(3)
γ_3	897.84(8)	0.128(6)	0.125(6)
γ_4	1063.662(4)	76.2(4)	74.5(4)
γ_5	1442.10(8)	0.134(3)	0.131(3)
γ_6	1770.237(10)	7.03(3)	6.87(3)
γ^-	511.00		0.027(4)

X_{K_i} (Pb)	E_{XK_i}, keV	I'_{XK_i}	I_{XK_i}, %
K_{α_2}	72.805	59.4(12)	22.4(9)
K_{α_1}	74.969	100	37.6(14)
$K_{\beta'_1}$	87.632	34.2(7)	12.9(5)
$K_{\beta'_2}$	87.632	10.2(2)	3.8(2)

ΣI_{XK}	76.7(25)%

$\langle E_{\gamma+XK} \rangle$	598.5(36) keV
$\langle\langle E_{\gamma+XK} \rangle\rangle$	1532.7(45) keV/decay
$\Sigma I_{\gamma+XK}$	256.1(25)%

$\Gamma_{\gamma+XK}$	8.32(32) R·cm²·h⁻¹·mCi⁻¹
$\Gamma_{\delta=30}$	54.5(21) aGy·m²·s⁻¹·Bq⁻¹

X_{L_i} (Pb)	E_{XL_i}, keV	I_{XL_i}, %
L_1	9.185	0.78 (8)
L_{α_2}	10.449	1.5(1)
L_{α_1}	10.551	13.3(7)

L_η	11.349	0.19(2)
L_β	12.699	14.4(7)
L_γ	14.914	2.8(3)

ΣI_{XL}	33.0(17)%
$\langle E_{XL} \rangle$	11.827(44) keV
$\langle\langle E_{XL} \rangle\rangle$	3.90(12) keV/decay

KBK

γ_i	σL	α_K	α_L	α_M	α_N
γ_2	E2	0.0157	0.0046	0.0012	0.0219
γ_3	(M1)	0.0194			
γ_4	M4	0.0950	0.0250	0.0061	0.128
γ_6	(M1)	0.0034			

e_i	E_{e_i}, keV	I_{e_i}, %
$K(\gamma_2)$	481.70(1)	1.53(2)
$L(\gamma_2)$	554.48(3)	0.45(1)
$MNO(\gamma_2)$	567.16(5)	0.16(1)
$K(\gamma_3)$	809.84(8)	0.0024(2)
$K(\gamma_4)$	975.66(1)	7.08(7)
$L(\gamma_4)$	1048.30(3)	1.86(4)
$MNO(\gamma_4)$	1061.10(5)	0.60(2)
$K(\gamma_6)$	1682.23(2)	0.023(1)

$\langle E_e \rangle$	906.6(11) keV
$\langle\langle E_e \rangle\rangle$	106.9(9) keV/decay