^{214}Bi - Comments on evaluation of decay data by V. Chisté and M. M. Bé

This evaluation was completed in 2007. Literature available by December 2007 was included. The half-life value was re-evaluated in Dec. 2010 in order to include the Martz's result.

1 Decay Scheme

^{214}Bi disintegrates by beta minus emissions to the excited levels and to the ground state of ^{214}Po (99.979 (13) %) and by alpha emission to the excited levels of ^{210}Tl (0.021 (13) % (1960Wa14)). Spins and parities are from the mass-chain evaluation of Y. A. Akovali (1988Ak01 and 1995El07 for A = 214) and E. Browne (2003Br13 for A = 210).

A good agreement was found between the adopted Q(β^-) value of Audi and the effective Q(β^-) value of 3261 (10) keV calculated from decay scheme data.

2 Nuclear Data

The Q value is from the atomic mass evaluation of Audi *et al.* (2003Au03).

Experimental ^{214}Bi half-life values (in minutes) are given in Table 1:

Table 1: Experimental values of ^{214}Bi half-life

Reference	Experimental value (min)	Comments
H. Daniel (1956Da06)	19.9 (4)	
D. E. Martz (1991Ma**)	19.71 (2)	Uncertainty increased to take into account systematic uncertainty.
Recommended value	**19.8 (1)**	$\chi^2 = 0.25$

The original uncertainty value given by D. E. Martz (1991Ma**) was multiplied by 2, in order to take into account the systematic uncertainties which were not considered by 1991Ma**. With the 2 values presented in Table 1, an average was calculated using LWEIGHT computer code (version 3). The reduced-χ^2 value is 0.25.

Due the difficulty in estimating a realistic uncertainty to the Martz value, the evaluators have decided to recommend for the half-life the unweighted average of 19.8 minutes with an uncertainty of 0.1 minute, covering both experimental values.

2.1 β^- Transitions and Emissions

The maximum energies of the β^- transitions in the decay of ^{214}Bi → ^{214}Po have been obtained from the Q^- value (2003Au03) and the level energies given in Table 2 from Y. A. Akovali (1995El07).

Table 2: ^{214}Po levels populated in the decay of ^{214}Bi.

Level Number	Level energy, (keV)	Spin and parity	Level Number	Level energy, (keV)	Spin and parity
0	0	0^+	**37**	2662.29 (12)	(2^+)
1	609.316 (7)	2^+	**38**	2694.6 (2)	$1^{(-)}, 2^+$
4	1377.675 (12)	2^+	**39**	2698.8 (3)	$1^{(-)}, 2^+$
5	1415.489 (19)	0^+	**40**	2699.2 (2)	$1^{(-)}, 2^+$
6	1543.375 (14)	2^+	**41**	2719.22 (9)	$1^-, 1^+, 2^+$
7	1661.28 (3)	2^+	**42**	2728.59 (4)	$(1,2)^+$

Level Number	Level energy, (keV)	Spin and parity	Level Number	Level energy, (keV)	Spin and parity
8	1712.93 (20)	$(3)^+$	**43**	2769.9 (2)	$1^-, 1^+, 2^+$
9	1729.611 (13)	2^+	**44**	2785.9 (2)	$1^-, 1^+, 2^+$
10	1742.98 (3)	0^+	**47**	2827.0 (2)	$1^-, 1^+, 2^+$
11	1764.498 (14)	1^+	**48**	2861.1 (3)	$1^-, 1^+, 2^+$
12	1847.431 (14)	2^+	**49**	2869.6 (2)	
13	1890.287 (21)	2^+	**50**	2880.3 (2)	$1^-, 1^+, 2^+$
14	1994.63 (3)	$(2)^-$	**51**	2893.6 (2)	$1^-, 1^+, 2^+$
15	2010.81 (4)	2^+	**52**	2897.0 (3)	
16	2017.3 (5)	0^+	**53**	2919.5 (3)	
17	2088.41 (12)	$1^-, 1^+, 2^+$	**54**	2921.8 (4)	$1^-, 1^+, 2^+$
18	2118.552 (17)	1^+	**55**	2928.6 (3)	$1^-, 1^+, 2^+$
19	2147.78 (6)	$1^{(-)}, 2^+$	**56**	2934.5 (3)	$1^-, 1^+, 2^+$
20	2192.56 (4)	2^+	**57**	2940.6 (2)	$1^{(-)}, 2^-, 2^+$
21	2204.13 (9)	1^+	**58**	2962.8 (7)	
23	2266.39 (18)	$1^{(-)}, 2^+$	**60**	2978.8 (2)	$1^-, 1^+, 2^+$
24	2293.34 (5)	$1^{(+)}, 2^+$	**61**	2986.2 (2)	$(1^-), 2^-, 2^+$
25	2348.3 (9)	$1^-, 1^+, 2^+$	**62**	3000.0 (2)	$1^{(-)}, 2^+$
26	2360.8 (4)	$1^-, 1^+, 2^+$	**65**	3014.1 (3)	$1^-, 1^+, 2^+$
27	2423.19 (15)	$1^+, 2^-, 2^+$	**69**	3053.9 (2)	$1^-, 1^+, 2^+$
28	2447.70 (6)	1^-	**70**	3068.3 (8)	
29	2482.46 (4)	$(2)^+$	**72**	3081.7 (3)	$1^-, 1^+, 2^+$
30	2505.21 (15)	$1^{(-)}, 2^+$	**73**	3094.0 (4)	$(1^-, 2^+)$
31	2508.2 (2)		**75**	3142.6 (4)	$1^-, 1^+, 2^+$
32	2544.9 (3)		**76**	3149.2 (5)	$1^-, 1^+, 2^+$
34	2562.4 (3)		**77**	3160.4 (6)	$1^-, 1^+, 2^+$
35	2604.66 (14)	$(2)^+$	**79**	3173.3 (6)	
36	2630.85 (17)	$1^-, 1^+, 2^+$	**80**	3183.6 (4)	$1^-, 1^+, 2^+$

The adopted β^- transition probabilities and the associated uncertainties were deduced from the γ transition probability balance at each level of the decay scheme.

The values of log ft and average β^- energies have been calculated with the program LOGFT for the allowed an 1st forbidden β^- transitions.

2.2 γ Transitions

The γ-ray transition probabilities were calculated using the γ-ray emission intensities and the relevant internal conversion coefficients (see **4.2 γ Emissions**).

Multipolarities of γ-ray transitions are from Y. A. Akovali (1995El07 for A = 214) and E. Browne (2003Br13 for A = 210) and shown in Table 3.

Table 3: Multipolarities of γ-ray transitions

	Multipolarity	E_γ (keV)
^{210}Tl	(M1)	62.5 (10)
^{214}Po	[M1,E2]	221 (1), 386.823 (18), 452.92 (10), 469.756 (18), 474.52 (5), 543.0 (2), 595.32 (7), 633.14 (10), 634.72 (21), 649.19 (7), 661.1 (2), 697.88 (20), 740.73 (18), 752.84 (3), 814.885 (10), 878.03 (12), 915.74 (15), 939.6 (5), 991.49 (19), 1051.964 (31), 1103.61 (20), 1104.79 (19)

	[M1]	252.80 (6), 349.009 (24), 388.941 (50), 461.15 (20), 703.11 (4), 788.6 (5), 1594.81 (8)
	[E1]	268.614 (26), 333.35 (6), 454.850 (26), 487.95 (13), 572.76 (7), 615.53 (10), 617.0 (2), 683.22 (6), 704.9 (3), 786.1 (4), 904.29 (10), 917.8 (3), 1032.37 (8), 1069.96 (8), 1207.70 (3), 1385.314 (31)
	[E2]	405.74 (4), 528 (1),639.62 (10), 832.38 (11), 1133.664 (31), 1172.98 (10), 1543.375 (14)
	(E2)	1407.98 (4)
	(M1 + E2)	1401.494 (41) δ = 1.6 (5)
	E2	609.316 (7), 719.869 (37), 806.173 (20), 1377.675 (12), 1661.28 (6), 1729.611 (13),
	E1	665.445 (23), 2447.86 (10)
	M1 + E2	768.359 (14) δ = 2.8 (7)
		934.059 (16) δ = -0.3 (1)
		1120.295 (15) δ = 0.18 (2)
		1155.182 (16) δ = 0.33 (6)
		1238.115 (12) δ = -0.03 (3)
		1509.236 (15) δ = -0.053 (35)
		1583.244 (40) δ = -0.20 (10)
	M1	821.18 (3), 826.46 (20), 1280.97 (2), 1764.498 (14), 2118.552 (30), 2204.21 (4)

The internal conversion coefficients (ICC) and the associated uncertainties for these γ-ray transitions have been obtained using the BrIcc computer program (calculation for 'hole'), which interpolated the new values from theoretical values of I. M. Band (2002Ba85).

2.3 α Transitions and Emissions

The energies of the α-particle transitions given in Section 2.3 have been obtained from Q_α (2003Au03) and the level energies given by E. Browne (2003Br13) .

The adopted $\alpha_{0,0}$, $\alpha_{0,2}$ and $\alpha_{0,3}$ emission energies are the recommended values of A. Rytz (1991Ry01) and the other α emission energies are from E. Browne (2003Br13).

The recommended α emission probabilities come from the measured values of R. J. Walen (1960Wa14).

For the α of long range, the energy and emission probabilities are from the measurements of C.-F. Leang (1965Le08).

3 Atomic Data

Atomic values, ω_K, ϖ_L, ϖ_M, n_{KL} and fl_{LM} and the X-ray and Auger electron relative probabilities are from Schönfeld and Janβen (1996Sc06).

4 Electron Emissions

The conversion electron emission probabilities have been deduced from γ-ray transition data.

5 Photon Emissions

5.1 X-ray Emissions

The X-ray absolute intensities have been calculated from γ-ray data and ICC using the EMISSION computer program and compared in Table 4 with the measured values of U. Schötzig (1983Sc13).

Table 4: Experimental and recommended (calculated) values of X-ray absolute intensities

	U. Schötzig (1983Sc13)	Recommended values
Kα x-ray	1.77 (5) %	1.135 (25) %
Kβ x-ray		0.320 (9) %

5.2 γ Emissions

The γ-ray energies are from Y. A. Akovali (1995El07 for A = 214) and E. Browne (2003Br13 for A = 210).

For the ^{210}Tl γ-rays, the absolute γ-ray emission intensities have been deduced from the α emission intensities measured by R. J. Walen (1960Wa14).

The experimental relative γ-ray emission intensities in ^{214}Po are based on all available relative and absolute measurements of γ-rays for the ^{226}Ra decay chain. The normalization factor to convert the relative γ-ray emission intensities to absolute intensities is the weighted average of the measured values of the 609.3-keV γ-ray absolute intensity (Table 5).

Table 5: The experimental values of 609.3-keV γ-ray absolute intensity

References	Experimental values (%)	Comments
E. W. A. Lingeman (1969Li10)	42.8 (40)	
D. G. Olson (1983Ol01)	45.0 (7)	
U. Schötzig (1983Sc13)	44.6 (5)	
W. –J. Lin (1991Li11)	46.1 (5)	
J. Morel (1998Mo14)	44.8 (6)	Omitted : superseded by 2004Mo07
J. Morel (2004Mo07)	45.57 (18)	
Recommended value	**45.49 (19)**	$\chi^2 = 1.45$

Evaluators' recommended normalization factor is the weighted average of the five experimental values: 45.49 with an external uncertainty of 0.19.

The experimental relative γ-ray emission intensities are given in Table 6 relatively to the ^{214}Bi 609-keV γ-ray intensity.

Table 6: The experimental data set of the relative γ-ray emission intensities (next page).

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
221						0.012 (7)						0.130 (13)				0.130 (13)	
230												0.0063 (21)				0.0063 (21)	
252						0.033 (7)				0.028 (4)		0.019 (7)				0.0258 (39)	1.3
268						0.031 (8)				0.035 (4)		0.059 (28)				0.0355 (40)	0.72
273	0.18 (9)			0.384 (50)		0.25 (5)				0.27 (3)		0.29 (10)	0.265 (23)		0.278 (17)	0.264 (18)	0.33
280	0.132 (22)			0.136 (50)		0.13 (2)				0.13 (2)		0.17 (4)				0.136 (14)	0.42
304	0.18 (9)			0.074 (25)		0.069 (15)				0.055 (5)		0.065 (20)				0.056 (5)	1.1
333			0.148 (23)	0.15 (7)		0.16 (3)				0.14 (1)		0.13 (3)				0.139 (9)	0.1
334	0.132 (44)			0.074 (37)		0.072 (14)				0.066 (8)		0.090 (17)				0.072 (10)	1.8
348										0.34 (5)		0.20 (5)				0.27 (7)	3.9
386	0.68 (26)		1.41 (18)	0.64 (7)		0.64 (10)				0.63 (5)		0.70 (15)	0.651 (12)		0.647 (11)	0.650 (12)	0.10
388	0.81 (26)			0.83 (7)		0.87 (12)				0.85 (1)	0.92 (6)	0.86 (4)	0.888 (14)		0.89 (13)	0.864 (10)	1.5
394				0.019 (9)		0.033 (4)				0.032 (3)		0.024 (3)				0.0280 (40)	3.6
396				0.050 (25)		0.060 (9)				0.059 (7)		0.053 (10)				0.057 (4)	0.24
405	0.33 (9)		0.341 (34)	0.40 (7)		0.38 (5)				0.37 (2)		0.39 (3)				0.375 (16)	0.28
452						0.068 (11)				0.067 (8)						0.067 (8)	
454	0.62 (11)		0.64 (7)	0.64 (7)		0.67 (8)	0.63 (2)			0.64 (3)		0.59 (3)	0.640 (12)		0.642 (12)	0.634 (10)	0.82
461						0.078 (13)				0.14 (2)		0.10 (3)				0.128 (18)	1.2
469						0.30 (5)				0.27 (2)		0.34 (3)				0.292 (32)	3.8
474	0.15 (7)			0.24 (7)		0.23 (4)				0.22 (2)		0.190 (20)				0.203 (14)	0.86
485						0.052 (11)				0.048 (9)		0.035 (20)				0.046 (8)	0.35
487										0.061 (20)						0.061 (20)	
494						0.031 (5)				0.031 (4)		0.019 (3)				0.023 (6)	5.8
496						0.015 (4)				0.015 (4)						0.015 (4)	
501				0.038 (7)		0.041 (7)				0.040 (5)		0.035 (19)				0.0397 (48)	0.06
519				0.0124 (50)		0.035 (6)				0.036 (4)		0.039 (11)				0.0364 (38)	0.07
524				0.033 (12)		0.038 (6)				0.037 (4)		0.039 (13)				0.0372 (38)	0.02
528						0.025 (5)				0.024 (3)		0.022 (11)				0.0239 (29)	0.03
536				0.124 (50)		0.14 (2)				0.14 (2)		0.12 (3)				0.134 (17)	0.31
543	0.22 (7)		0.296 (34)	0.20 (7)		0.14 (2)				0.13 (2)		0.27 (4)				0.194 (46)	3.4
547	0.066 (22)			0.071 (14)		0.08 (1)				0.08 (1)		0.074 (7)				0.075 (6)	0.22
551										0.012 (3)						0.012 (3)	
572	0.132 (44)		0.159 (23)	0.161 (25)		0.17 (2)				0.16 (2)		0.16 (4)				0.156 (17)	0.17
595						0.035 (7)				0.038 (4)		0.039 (6)				0.0383 (33)	0.02
600										0.018 (8)						0.018 (8)	

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
609	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
615	0.20 (7)			0.099 (25)		0.13 (5)				0.12 (2)		0.11 (3)				0.121 (16)	0.71
617				0.074 (25)		0.066 (44)				0.053 (6)		0.077 (11)				0.059 (10)	3.7
626						0.036 (6)						0.009 (3)				0.009 (3)	
630			0.228 (34)	0.037 (12)		0.039 (6)				0.035 (4)		0.039 (5)				0.0366 (31)	0.39
633	0.110 (44)			0.124 (12)		0.12 (2)				0.11 (1)		0.130 (10)				0.120 (7)	1,0
634						0.014 (5)				0.014 (5)						0.014 (5)	
639				0.074 (25)		0.061 (11)				0.065 (10)		0.085 (10)				0.075 (10)	2,0
649	0.110 (44)			0.124 (12)		0.114 (15)				0.13 (2)		0.10 (3)				0.119 (16)	0.37
658						0.037 (8)				0.046 (8)		0.030 (8)				0.038 (8)	2,0
661				0.094 (37)		0.077 (13)				0.11 (2)		0.120 (10)				0.118 (9)	0.2
665	3.08 (44)		3.49 (30)	3.59 (37)		3.36 (37)	2.87 (6)			3.51 (20)	3.21 (7)	3.33 (10)	3.359 (17)	3.386 (21)	3.364 (17)	3.364 (15)	1.4
677						0.012 (5)				0.012 (5)						0.012 (5)	
683	0.176 (44)		0.296 (46)	0.186 (25)		0.18 (3)				0.18 (2)		0.190 (20)				0.184 (13)	0.08
687				0.012 (6)		0.016 (5)				0.015 (4)		0.014 (5)				0.0146 (31)	0.02
693				0.012 (6)		0.012 (5)				0.015 (6)		0.012 (4)				0.0129 (33)	0.17
697	0.154 (44)		0.501 (46)	0.100 (50)		0.14 (2)				0.14 (2)		0.150 (10)				0.148 (9)	0.11
699						0.044 (9)				0.035 (10)						0.035 (10)	
703	1.03 (13)		1.55 (16)	1.14 (12)		1.08 (15)	0.82 (3)			1.11 (7)	1.038 (27)	1.12 (8)				1.053(24)	0.57
704										0.11 (3)		0.113 (29)				0.112 (21)	0.006
708						0.031 (9)				0.042 (11)		0.025 (3)				0.0262 (43)	2.2
710	0.13 (7)		0.364 (34)	0.161 (50)		0.16 (2)				0.16 (2)		0.170 (9)				0.168 (8)	0.25
719	0.84 (11)		1.22 (13)	0.94 (12)		0.90 (13)				0.91 (8)	0.833 (24)	0.91 (3)				0.865 (22)	1.5
722				0.099 (50)		0.075 (11)				0.073 (9)		0.107 (15)				0.082 (15)	3.8
733	0.066 (22)			0.087 (25)		0.086 (12)				0.085 (8)		0.092 (17)				0.084 (7)	0.45
740						0.11 (2)				0.088 (13)		0.095 (5)				0.0941 (47)	0.25
752	0.24 (7)			0.31 (7)		0.30 (4)				0.28 (2)		0.28 (4)				0.278 (17)	0.15
768		9.90 (21)	10.6 (10)	11.4 (12)	10.90 (15)	11.9 (17)	10.64 (20)		10.46 (16)	10.91 (8)	10.86 (14)	10.39 (31)	10.66 (5)	10.77 (3)	10.68 (5)	10.755 (36)	2.3
786	0.64 (18)											0.70 (10)				0.69 (10)	0.09
788										0.041 (8)		0.020 (10)				0.033 (10)	2.7
806	2.42 (44)μ		2.68 (25)	2.97 (37)		2.92 (43)	2.49 (6)			2.90 (22)	2.682 (45)	2.76 (11)	2.788 (22)	2.777 (14)	2.791 (20)	2.774 (13)	1.2
815	0.088 (44)			0.050 (25)		0.087 (13)				0.081 (8)		0.110 (20)				0.085 (7)	0.91
821	0.35 (9)			0.40 (7)		0.37 (6)				0.36 (3)		0.37 (3)				0.364 (21)	0.04
826	0.29 (13)			0.21 (7)		0.29 (4)				0.28 (3)		0.29 (4)				0.284 (24)	0.02
832	0.066 (22)			0.062 (25)		0.064 (10)				0.062 (6)		0.080 (3)				0.076 (5)	3.7

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
847				0.037 (12)		0.052 (12)				0.057 (7)		0.053 (15)				0.035 (13)	0.06
873						0.032 (10)				0.042 (9)		0.040 (10)				0.041 (7)	0.02
878						0.022 (7)				0.026 (6)						0.026 (6)	
904	0.15 (7)			0.198 (50)		0.15 (2)				0.14 (2)		0.16 (4)				0.144 (17)	0.1
915				0.050 (12)		0.070 (14)				0.065 (8)		0.043 (6)				0.051 (11)	4.8
917						0.010 (7)				0.010 (7)						0.010 (7)	
930						0.058 (13)				0.10 (2)		0.08 (3)				0.094 (17)	0.31
934	6.8 (7)	6.26 (18)	7.0 (7)	7.3 (7)	6.93 (10)	7.0 (9)	6.54 (13)		6.75 (9)	6.88 (5)	6.66 (9)	6.70 (20)	6.783 (34)	6.83 (4)	6.788 (34)	6.814 (22)	1.05
939						0.030 (8)				0.028 (8)		0.045 (9)				0.036 (8)	2,0
943			0.205 (34)	0.037 (12)		0.034 (8)				0.037 (6)		0.050 (26)				0.038 (6)	0.24
949						0.009 (6)				0.012 (5)						0.012 (5)	
952										0.013 (5)						0.013 (5)	
961						0.046 (12)				0.03 (2)		0.022 (3)				0.0222 (30)	0.16
964	0.81 (11)		0.78 (8)	0.85 (9)		0.82 (10)				0.80 (5)	0.796 (38)	0.80 (7)				0.799 (27)	0.01
976				0.050 (25)		0.029 (8)				0.033 (5)		0.035 (13)				0.0333 (47)	0.02
991				0.0031 (15)		0.009 (6)				0.022 (5)		0.050 (22)				0.023 (6)	1.5
1013				0.022 (11)						0.018 (3)		0.034 (11)				0.0191 (41)	1.9
1021				0.025 (12)						0.034 (6)		0.036 (15)				0.034 (6)	0.02
1032	0.154 (44)			0.161 (50)						0.13 (1)		0.17 (3)				0.135 (9)	0.9
1038				0.025 (12)						0.018 (3)		0.030 (10)				0.0190 (33)	1.3
1045				0.062 (12)						0.051 (6)		0.037 (20)				0.050 (6)	0.45
1051	0.73 (9)		0.71 (7)	0.68 (7)			0.76 (3)			0.66 (5)	0.692 (24)	0.72 (4)				0.713 (17)	1.1
1067				0.062 (25)						0.055 (20)		0.051 (24)				0.053 (15)	0.02
1069	0.57 (9)		0.73 (14)	0.62 (7)						0.56 (4)	0.605 (33)	0.65 (6)				0.595 (23)	0.59
1103	0.35 (7)			0.21 (10)						0.21 (3)		0.24 (7)				0.233 (33)	1.7
1104			0.250 (34)	0.17 (7)						0.16 (3)						0.16 (3)	
1118										0.015 (8)		0.034 (11)				0.022 (9)	1.9
1120	33.0 (33)	31.90 (73)	29.4 (28)	34.0 (35)	32.72 (39)		33.52 (42)	32.73 (48)	32.31 (46)	33.13 (22)	33.19 (46)	32.3 (10)	32.71 (10)	32.77 (12)	32.74 (10)	32.77 (7)	0.64
1130				0.099 (25)						0.078 (9)		0.080 (11)				0.079 (7)	0.02
1133	0.55 (11)		0.478 (46)	0.62 (6)						0.56 (3)	0.545 (29)	0.57 (3)				0.558 (17)	0.12
1155	3.74 (44)		3.72 (34)	3.96 (50)			3.65 (7)			3.5 (4)	3.583 (46)	3.4 (7)	3.594 (36)	3.595 (17)	3.597 (32)	3.594 (15)	0.06
1167				0.021 (17)						0.027 (4)		0.028 (10)				0.0271 (37)	0.01
1172	0.066 (22)μ			0.113 (41)						0.098 (12)		0.132 (9)				0.120 (16)	5.1
1207	1.03 (13)		0.89 (9)	1.10 (11)						0.98 (6)	0.991 (35)	1.04 (7)				0.998 (27)	0.18
1226				0.058 (19)						0.028 (11)		0.074 (20)				0.039 (18)	4.1

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
1230										0.015 (6)		0.08 (4)				0.016 (10)	2.6
1238	13.4 (13)μ	12.77 (12)	12.8 (11)	14.9 (15)	12.94 (17)		13.25 (22)	13.01 (18)	12.71 (16)	12.87 (9)	12.73 (18)	12.7 (4)	12.83 (6)	12.80 (4)	12.85 (5)	12.819 (29)	0.43
1280	3.30 (44)μ		2.92 (28)	3.59 (50)			3.22 (6)			3.17 (17)	3.144 (46)	3.15 (11)	3.147 (28)	3.159 (16)	3.151 (28)	3.155 (13)	0.05
1284										0.052 (12)		0.020 (7)				0.028 (14)	5.3
1303	0.24 (7)		0.284 (34)	0.25 (6)						0.21 (2)	0.246 (15)	0.20 (5)				0.231 (12)	0.83
1316	0.154 (44)			0.198 (50)						0.16 (2)		0.20 (3)				0.170 (16)	0.69
1330				0.024 (11)						0.026 (3)		0.039 (17)				0.0264 (30)	0.57
1341				0.050 (25)						0.046 (6)		0.059 (29)				0.047 (6)	0.19
1351			0.205 (34)							0.008 (2)		0.014 (4)				0.0092 (24)	1.8
1353				0.0099 (25)						0.008 (2)						0.008 (2)	
1377	9.5 (11)μ	8.70 (48)	9.0 (9)	9.9 (11)	8.87 (15)		8.66 (16)			8.82 (12)	8.79 (14)	8.52 (25)μ	8.689 (19)	8.79 (3)	8.720 (44)	8.722 (25)	2.5
1385	1.76 (33)	1.29 (30)	1.66 (17)	2.04 (20)						1.81 (8)μ	1.664 (40)μ	1.76 (5)	1.744 (17)	1.755 (16)	1.750 (19)	1.750 (11)	1.8
1392				0.041 (19)						0.018 (4)		0.035 (15)				0.0191 (42)	1.2
1401	3.30 (44)μ		3.03 (28)	3.47 (37)						2.91 (16)	2.792 (45)	3.0 (4)	2.924 (20)	2.934 (13)	2.927 (20)	2.923 (16)	2.3
1407	5.7 (7)		5.9 (6)	6.2 (7)						5.37 (6)	4.73 (13)μ	5.5 (5)	5.233 (26)	5.250 (19)	5.245 (42)	5.252 (17)	1.3
1419				0.0111 (25)						0.011 (3)		0.013 (3)				0.0120 (21)	0.22
1470										0.020 (3)		0.035 (15)				0.0206 (29)	0.96
1479	0.110 (44)			0.124 (50)						0.11 (1)		0.14 (3)				0.113 (9)	0.45
1509	4.84 (44)		4.77 (46)	5.45 (50)	4.78 (9)		4.77 (9)		4.57 (11)	4.76 (5)	4.64 (9)	4,63 (15)	4.61 (6)	4.67 (3)	4.64 (6)	4.679 (21)	0.95
1515										0.015 (2)		0.039 (10)				0.0159 (46)	5.5
1538	1.17 (13)μ		0.72 (7)	1.14 (12)						0.95 (6)	0.827 (31)	0.98 (5)				0.882 (49)	4.1
1543	0.75 (18)			0.74 (7)						0.68 (4)	0.44 (11)	0.67 (3)				0.664 (29)	1.5
1583	1.60 (15)		1.47 (5)	1.86 (19)			1.57 (3)			1.58 (8)	1.517 (34)	1.64 (17)		1.556 (13)		1.555 (11)	0.39
1594	0.66 (20)		0.51 (6)	0.69 (6)						0.61 (4)	0.55 (8)	0.63 (10)				0.603 (33)	0.21
1599	0.75 (20)		0.66 (7)	0.85 (11)						0.72 (4)	0.51 (12)	0.73 (7)				0.707 (33)	0.98
1636				0.040 (12)						0.024 (3)		0.06 (3)				0.0244 (36)	1.4
1657				0.16 (7)						0.10 (1)		0.14 (3)				0.104 (12)	1.6
1661	2.55 (26)		2.49 (20)	2.72 (25)			2.55 (5)			2.33 (12)	2.53 (7)	2.37 (22)	2.271 (34)	2.299 (14)	2.284 (34)	2.304(20)	2.5
1665										0.018 (3)		0.046 (9)				0.032 (14)	4.8
1683	0.53 (9)		0.52 (6)	0.56 (6)						0.49 (3)	0.475 (13)	0.43 (4)		0.481 (9)		0.478 (7)	0.52
1711												0.050 (10)				0.050 (10)	
1729	7.03 (9)μ	6.94 (20)	6.6 (6)	7.5 (7)	6.29 (10)		6.56 (12)			6.60 (4)μ	6.42 (9)	6.33 (15)	6.226 (31)	6.25 (3)	6.229 (31)	6.251 (22)	1.2
1751										0.002 (1)						0.002 (1)	
1764	36.7 (35)μ	35.34 (10)	34.4 (34)	40.0 (40)	34.23 (44)		34.91 (41)		33.2(7)	34.48 (25)	33.85 (46)	33.3 (10)	33.54 (10)	33.63 (9)	33.56 (10)	33.66 (10)	2.5
1813				0.026 (10)						0.024 (2)		0.020 (10)				0.0238 (20)	0.15

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
1838	0.81 (11)		0.88 (8)	0.89 (10)						0.74 (3)		0.77 (4)				0.753(23)	0.32
1847	5.1 (7)μ		4.76 (46)	5.32 (50)	4.52 (9)		4.59 (9)			4.57 (6)		4.35 (13)	4.448 (36)	4.42 (3)	4.457 (31)	4.451 (26)	1.6
1873	0.48 (11)		0.478 (46)	0.557 (50)						0.46 (2)		0.51 (5)				0.467 (18)	0.44
1890	0.22 (7)		0.205 (46)	0.21 (7)						0.17 (1)		0.17 (3)				0.171 (9)	0.25
1895	0.40 (9)		0.432 (46)	0.37 (6)						0.31 (2)		0.35 (4)				0.321 (18)	0.8
1898				0.136 (50)						0.11 (2)		0.10 (3)				0.107 (17)	0.08
1935			0.432 (46)	0.111 (50)						0.067 (7)		0.16 (4)				0.070 (16)	5.2
1994										0.005 (1)		0.010 (5)				0.0052 (10)	0.96
2010	0.081 (13)			0.111 (12)						0.100 (5)		0.093 (5)				0.0954 (37)	1.1
2021				0.074 (12)						0.045 (5)		0.057 (11)				0.0471 (46)	0.99
2052	0.154 (44)		0.250 (34)	0.173 (25)						0.15 (1)		0.16 (3)				0.151 (9)	0.52
2085	0.022 (7)			0.0198 (50)						0.018 (1)						0.0181 (10)	0.32
2089	0.110 (22)		0.137 (46)	0.124 (12)						0.096 (5)		0.12 (3)				0.0973 (48)	0.49
2109	0.220 (44)		0.20 (6)	0.235 (50)					0.180 (9)	0.19 (1)		0.17 (3)				0.185 (6)	0.48
2118	2.86 (33)μ	2.76 (13)	2.61 (23)	3.03 (31)	2.53 (5)		2.51 (5)		2.57 (7)	2.56 (3)		2.65 (25)μ	2.536 (20)	2.548 (21)	2.537 (20)	2.545 (12)	0.17
2147	0.026 (7)			0.036 (10)						0.029 (2)		0.050 (10)				0.0295 (28)	2.3
2160										0.004 (1)		0.026 (1)				0.015 (11)	
2176										0.007 (1)		0.015 (6)				0.0072 (13)	1.7
2192	0.154 (44)			0.161 (50)					0.070 (13)	0.073 (6)		0.093 (5)				0.084 (7)	3.4
2204	11.7 (11)μ	11.22 (47)	11.37 (24)	12.38 (27)	10.77 (20)		10.66 (20)		10.95 (70)	11.02 (9)		11.1 (3)	10.74 (5)	10.75 (9)	10.76 (5)	10.80 (5)	1.8
2251				0.015 (7)						0.012 (1)						0.012 (1)	
2260			0.057 (23)	0.0149 (50)						0.019 (1)		0.020 (3)				0.0191 (9)	0.1
2266	0.033 (7)			0.045 (12)						0.037 (2)		0.034 (4)				0.0362 (17)	0.34
2270				0.0111 (50)						0.0029 (5)		0.010 (5)				0.0030 (7)	2,0
2284										0.011 (1)		0.011 (3)				0.0110 (9)	
2287										0.010 (1)						0.010 (1)	
2293	0.73 (9)		0.67 (7)	0.83 (9)			0.67 (2)		0.662 (20)	0.67 (3)		0.72 (6)	0.665 (17)	0.677 (10)	0.665 (17)	0.673 (8)	0.57
2310										0.003 (2)						0.003 (2)	
2312	0.020 (7)			0.0235 (50)						0.019 (2)		0.018 (5)				0.0189 (18)	0.029
2319										0.0009 (3)		0.0050 (10)				0.0030 (20)	8.4
2325				0.0040 (20)						0.0037 (4)		0.009 (3)				0.0038 (7)	3.1
2331	0.046 (9)		0.034 (11)	0.0557 (50)						0.048 (3)		0.076 (7)				0.056 (9)	5.7
2348										0.0003 (2)						0.0003 (2)	
2353										0.0008 (3)						0.0008 (3)	
2361				0.0040 (12)						0,0033 (3)		0.0060 (10)				0.0046 (14)	3.6

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
2369										0.006 (1)		0.008 (3)				0.0062 (9)	0.4
2376	0.0132 (44)		0.057 (23)	0.022 (7)						0.019 (1)		0.034 (7)				0.0190 (17)	3.2
2390				0.0042 (10)						0.0034 (3)		0.006 (3)				0.00343 (30)	0.74
2405										0.0009 (3)		0.0040 (10)				0.0024 (16)	4.8
2423	0.0132 (44)			0.0115 (40)						0.010 (1)		0.018 (4)				0.0106 (14)	2.1
2444										0,018 (9)						0.018 (9)	
2447	3.63 (40)μ	3.32 (6)	3.79 (28)	3.96 (37)	3.32 (8)		3.28 (6)			3.42 (3)		3.30 (10)	3.402 (24)	3.41 (4)	3.408 (24)	3.403 (16)	0.50
2459										0.0031 (5)						0.0031 (5)	
2482				0.0046 (19)						0.0021 (4)						0.0021 (4)	6.1
2505	0.0154 (44)			0.0149 (37)						0.012 (1)		0.025 (7)				0.0124 (13)	1.9
2550										0.0007 (2)						0.0007 (2)	
2562										0.0004 (3)						0.0004 (3)	
2564										0.0003(2)						0.0003(2)	
2604				0.00099 (25)						0.0008 (2)						0.0008 (2)	
2630				0.0020 (10)						0.0018 (3)		0.0050 (17)				0.0019 (5)	3.4
2662										0.0006 (2)		0.0004 (1)				0.00044 (9)	0.8
2694	0.068 (9)		0.072 (34)	0.079 (7)			0.078 (2)			0.066 (3)		0.062 (4)				0.072 (6)	4.5
2699	0.0110 (44)			0.0050 (19)						0.0061 (5)						0.0062 (5)	1.2
2719	0.0033 (11)			0.0040 (12)						0.0038 (4)						0.00374 (38)	0.18
2769	0.057 (9)		0.057 (23)	0.062 (7)			0.047 (2)			0.053 (3)		0.048 (15)				0.0494 (17)	1.2
2785	0.0110 (22)			0.0149 (25)						0.012 (1)		0.030 (11)				0.0120 (11)	1.4
2826	0.0046 (11)			0.0062 (12)						0.0048 (4)		0.011 (6)				0.00480 (38)	0.55
2861				0.00074 (37)						0.0009 (2)		0.008 (5)				0.00091 (28)	2.01
2880	0.0176 (33)		0.019 (6)	0.024 (7)						0.020 (2)		0.030 (3)				0.0222 (35)	4.8
2893	0.0132 (33)		0.016 (7)	0.0149 (37)						0.012 (1)		0.017 (3)				0.0126 (10)	1.3
2921	0.035 (7)		0.032 (11)	0.037 (6)						0.029 (1)		0.035 (4)				0.0295 (11)	1.4
2928				0.0026 (10)						0.0024 (2)						0.0024 (2)	
2934				0.00124 (50)						0.0010 (2)		0.005 (3)				0.00102 (27)	1.8
2978	0.031 (7)		0.038 (23)	0.037 (6)			0.029 (2)			0.030 (1)		0.034 (7)				0.0302 (9)	0.85
2999	0.0220 (44)		0.015 (7)	0.024 (6)						0.019 (1)		0.030 (5)				0.0195 (15)	2.5
3053	0.046 (7)		0.046 (23)	0.053 (7)						0.041 (2)		0.057 (3)				0.048 (7)	1.8
3081	0.0110 (44)			0.0124 (37)						0.011 (1)		0.020 (4)				0.0115 (15)	2.4
3093				0.00111 (37)						0.0008 (1)		0.0010 (3)				0.00082 (9)	0.4
3142	0.0022 (9)			0.0035 (12)						0.0026 (2)		0.0060 (28)				0.00260 (19)	0.84
3149										0.00019						0.00019	

Energy (keV)	1969Li10	1696Wa27*	1969Gr33*	1975Ha31*	1977Zo01	1982Ak03*	1982Fa10*	1983Ol01	1983Sc13	1990Mouze	1991Li11	2000Sa32	2002De03	2002MoZP	2004Mo07*	Evaluated	χ2
3160	0.00110 (44)			0.00111 (50)						0.0010 (2)		0.0030 (17)				0.00104 (18)	0.7
3183	0.00110 (44)			0.0032 (10)						0.0028 (2)		0.0060 (10)				0.0023 (10)	1.3

*: Not used by the evaluators (see below).
μ: the experimental value has been shown to be outlier value by the Lweight program.

There were omitted from analysis:

a) four sets of values, A. Hachem (1975Ha31), G. Mouze (1981Mo28), H. Akcay (1982Ak03), G. Mouze (1990Mo08) and O. Diallo (1993Di09), because these values come from the same laboratory of G. Mouze (1990Mo**).

b) the sets of values from K. Ya. Gromov (1969Gr33), G. Wallace (1969Wa27) and M. A. Farouk (1982Fa10), because of a lack of information in the articles about the experimental measurements carried out and, therefore on the results.

c) the relative γ-ray intensity values given in 2004Mo07, because they are those measured by J. U. Delgado (2002De03). In 2004Mo07, the author measured the absolute 609.3-keV γ-ray emission probability (Table 5) and normalized the 2002De03 data set with their value of 45.57 (18).

The adopted values are the weighted means calculated by the Lweight program (version 3).

The evaluated relative and absolute γ-ray intensities are given in Table 7.

Table 7: Evaluated relative and absolute γ-ray intensities

Energy (keV)	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	**Energy (keV)**	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	**Energy (keV)**	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	**Energy (keV)**	Relative emission intensity (%)	Absolute γ-ray intensity (%)
221	0.130 (13)	0.059 (6)	**703**	1.053(24)	0.479 (11)	**1238**	12.819 (29)	5.831 (13)	**2204**	10.80 (5)	4.913 (23)
230	0.0063 (21)	0.0029 (10)	**704**	0.112 (21)	0.051 (10)	**1280**	3.155 (13)	1.435 (6)	**2251**	0.012 (1)	0.0055 (5)
252	0.0258 (39)	0.0117 (18)	**708**	0.0262 (43)	0.0119 (20)	**1284**	0.028 (14)	0.013 (6)	**2260**	0.0191 (9)	0.0087 (4)
268	0.0355 (40)	0.0161 (18)	**710**	0.168 (8)	0.076 (4)	**1303**	0.231 (12)	0.105 (5)	**2266**	0.0362 (17)	0.0165 (8)
273	0.264 (18)	0.120 (8)	**719**	0.865 (22)	0.393 (10)	**1316**	0.170 (16)	0.077 (7)	**2270**	0.0030 (7)	0.0014 (3)
280	0.136 (14)	0.062 (6)	**722**	0.082 (15)	0.037 (7)	**1330**	0.0264 (30)	0.0120 (14)	**2284**	0.0110 (9)	0.0050(4)
304	0.056 (5)	0.0255 (23)	**733**	0.084 (7)	0.038 (3)	**1341**	0.047 (6)	0.0214 (27)	**2287**	0.010 (1)	0.0046 (5)
333	0.139 (9)	0.063 (4)	**740**	0.0941 (47)	0.0428 (21)	**1351**	0.0092 (24)	0.0042 (11)	**2293**	0.673 (8)	0.306 (4)
334	0.072 (10)	0.033 (5)	**752**	0.278 (17)	0.126 (8)	**1353**	0.008 (2)	0.0036 (9)	**2310**	0.003 (2)	0.0014 (9)
348	0.27 (7)	0.123 (32)	**768**	10.755 (36)	4.892 (16)	**1377**	8.722 (25)	3.968 (11)	**2312**	0.0189 (18)	0.0086 (8)

Energy (keV)	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	Energy (keV)	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	Energy (keV)	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	Energy (keV)	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)
386	0.650 (12)	0.296 (5)	**786**	0.69 (10)	0.31 (5)	**1385**	1.750 (11)	0.796 (5)	**2319**	0.0030 (20)	0.0014 (9)
388	0.864 (10)	0.394 (5)	**788**	0.033 (10)	0.015 (5)	**1392**	0.0191 (42)	0.0087 (19)	**2325**	0.0038 (7)	0.0017 (3)
394	0.0280 (40)	0.0127 (18)	**806**	2.774 (13)	1.262 (6)	**1401**	2.923 (16)	1.330 (7)	**2331**	0.056 (9)	0.026 (4)
396	0.057 (4)	0.0259 (18)	**815**	0.085 (7)	0.039 (3)	**1407**	5.252 (17)	2.389 (8)	**2348**	0.003 (2)	0.0014 (9)
405	0.375 (16)	0.171 (7)	**821**	0.364 (21)	0.166 (10)	**1419**	0.0120 (21)	0.0055 (10)	**2353**	0.0008 (3)	0.00036 (14)
452	0.067 (8)	0.031 (4)	**826**	0.284 (24)	0.129 (11)	**1470**	0.0206 (29)	0.0094 (13)	**2361**	0.0046 (14)	0.0021 (6)
454	0.634 (10)	0.288 (5)	**832**	0.076 (5)	0.035 (2)	**1479**	0.113 (9)	0.051 (4)	**2369**	0.0062 (9)	0.0028 (4)
461	0.128 (18)	0.058 (8)	**847**	0.035 (13)	0.016 (6)	**1509**	4.679 (21)	2.128 (10)	**2376**	0.0190 (17)	0.0086 (8)
469	0.292 (32)	0.133 (15)	**873**	0.041 (7)	0.019 (3)	**1515**	0.0159 (46)	0.0072 (21)	**2390**	0.00343 (30)	0.00156 (14)
474	0.203 (14)	0.092 (6)	**878**	0.026 (6)	0.0118 (27)	**1538**	0.882 (49)	0.401 (22)	**2405**	0.0024 (16)	0.0011 (7)
485	0.046 (8)	0.021 (4)	**904**	0.144 (17)	0.066 (8)	**1543**	0.664 (29)	0.302 (13)	**2423**	0.0106 (14)	0.0048 (6)
487	0.061 (20)	0.028 (9)	**915**	0.051 (11)	0.023 (5)	**1583**	1.555 (11)	0.707 (5)	**2444**	0.018 (9)	0.008 (4)
494	0.023 (6)	0.011 (3)	**917**	0.010 (7)	0.005 (3)	**1594**	0.603 (33)	0.274 (15)	**2447**	3.403 (16)	1.548 (7)
496	0.015 (4)	0.0068 (18)	**930**	0.094 (17)	0.043 (8)	**1599**	0.707 (33)	0.322 (15)	**2459**	0.0031 (5)	0.00141 (23)
501	0.0397 (48)	0.0181 (22)	**934**	6.814 (22)	3.100 (10)	**1636**	0.0244 (36)	0.0111 (16)	**2482**	0.0021 (4)	0.00096 (18)
519	0.0364 (38)	0.0166 (17)	**939**	0.036 (8)	0.016 (4)	**1657**	0.104 (12)	0.047 (5)	**2505**	0.0124 (13)	0.0056 (6)
524	0.0372 (38)	0.0169 (17)	**943**	0.038 (6)	0.017 (3)	**1661**	2.304(20)	1.048 (9)	**2550**	0.0007 (2)	0.00032 (9)
528	0.0239 (29)	0.0109 (13)	**949**	0.012 (5)	0.0055 (23)	**1665**	0.032 (14)	0.015 (6)	**2562**	0.0004 (2)	0.00018 (9)
536	0.134 (17)	0.061 (8)	**952**	0.013 (5)	0.0059 (23)	**1683**	0.478 (7)	0.217 (3)	**2564**	0.0003(2)	0.00014 (9)
543	0.194 (46)	0.088 (21)	**961**	0.0222 (30)	0.0101 (14)	**1711**	0.050 (10)	0.023 (5)	**2604**	0.0008 (2)	0,00036 (9)
547	0.075 (6)	0.034 (3)	**964**	0.799 (27)	0.363 (12)	**1729**	6.251 (22)	2.844 (10)	**2630**	0.0019 (5)	0,00086 (23)
551	0.012 (3)	0.0055 (14)	**976**	0.0333 (47)	0.0151 (21)	**1751**	0.002 (1)	0.0009 (5)	**2662**	0.00044 (9)	0,00020 (4)
572	0.156 (17)	0.071 (8)	**991**	0.023 (6)	0.011 (3)	**1764**	33.66 (10)	15.31 (5)	**2694**	0.072 (6)	0.033 (3)
595	0.0383 (33)	0.0174 (15)	**1013**	0.0191 (41)	0.0087 (19)	**1813**	0.0238 (20)	0.0108 (9)	**2699**	0.0062 (5)	0.00282 (23)
600	0.018 (8)	0.008 (4)	**1021**	0.034 (6)	0.016 (3)	**1838**	0.753(23)	0.343 (10)	**2719**	0.00374 (38)	0.00170 (17)
609	100	45.49 (19)	**1032**	0.135 (9)	0.061 (4)	**1847**	4.451 (26)	2.025 (12)	**2769**	0.0494 (17)	0.0225 (8)
615	0.121 (16)	0.055 (7)	**1038**	0.0190 (33)	0.0086 (15)	**1873**	0.467 (18)	0.212 (8)	**2785**	0.0120 (11)	0.0055 (5)

617	0.059 (10)	0.027 (5)	**1045**	0.050 (6)	0.023(3)	**1890**	0.171 (9)	0.078 (4)	**2826**	0.00480 (38)	0.00218 (17)
Energy (keV)	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	**Energy (keV)**	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	**Energy (keV)**	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)	**Energy (keV)**	Relative γ-ray intensity (%)	Absolute γ-ray intensity (%)
626	0.009 (3)	0.0041 (14)	**1051**	0.713 (17)	0.324 (8)	**1895**	0.321 (18)	0.146 (8)	**2861**	0.00091 (28)	0.00041 (13)
630	0.0366 (31)	0.0166 (14)	**1067**	0.053 (15)	0.024 (7)	**1898**	0.107 (17)	0.049 (8)	**2880**	0.0222 (35)	0.0101 (16)
633	0.120 (7)	0.055 (3)	**1069**	0.595 (23)	0.271 (10)	**1935**	0.070 (16)	0.032 (7)	**2893**	0.0126 (10)	0.0057 (5)
634	0.014 (5)	0.0064 (23)	**1103**	0.233 (33)	0.106 (15)	**1994**	0.0052 (10)	0.0024 (5)	**2921**	0.0295 (11)	0.0134 (5)
639	0.075 (10)	0.034 (5)	**1104**	0.16 (3)	0.073 (14)	**2010**	0.0954 (37)	0.0434 (17)	**2928**	0.0024 (2)	0.00109 (9)
649	0.119 (16)	0.054 (7)	**1118**	0.022 (9)	0.010 (4)	**2021**	0.0471 (46)	0.0214 (21)	**2934**	0.00102 (27)	0.00046 (12)
658	0.038 (8)	0.017 (4)	**1120**	32.77 (7)	14.91 (3)	**2052**	0.151 (9)	0.069 (4)	**2978**	0.0302 (9)	0.0137 (4)
661	0.118 (9)	0.054 (4)	**1130**	0.079 (7)	0.036 (3)	**2085**	0.0181 (10)	0.0082 (5)	**2999**	0.0195 (15)	0.0089 (7)
665	3.364 (15)	1.530 (7)	**1133**	0.558 (17)	0.254 (8)	**2089**	0.0973 (48)	0.0443 (22)	**3053**	0.048 (7)	0.022 (3)
677	0.012 (5)	0.0055 (23)	**1155**	3.594 (15)	1.635 (7)	**2109**	0.185 (6)	0.084 (3)	**3081**	0.0115 (15)	0.0052 (7)
683	0.184 (13)	0.084 (6)	**1167**	0.0271 (37)	0.0123 (17)	**2118**	2.545 (12)	1.158 (5)	**3093**	0.00082 (9)	0.00037 (4)
687	0.0146 (31)	0.0066 (14)	**1172**	0.120 (16)	0.055 (7)	**2147**	0.0295 (28)	0.0134 (13)	**3142**	0.00260 (19)	0,00118 (9)
693	0.0129 (33)	0.0059 (15)	**1207**	0.998 (27)	0.454 (12)	**2160**	0.015 (11)	0.007 (5)	**3149**	0.00019	0.00019
697	0.148 (9)	0.067 (4)	**1226**	0.039 (18)	0.018 (8)	**2176**	0.0072 (13)	0.0033 (6)	**3160**	0.00104 (18)	0.00047 (8)
699	0.035 (10)	0.016(5)	**1230**	0.016 (10)	0.007 (5)	**2192**	0.084 (7)	0.038 (3)	**3183**	0.0023 (10)	0.0011 (5)

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