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Nuclear radius parameters (r_0) for even-even nuclei from alpha decay

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The decay data for 186 even-even alpha emitters have been analyzed, and used as input in the ALPHAD code to extract nuclear radius parameters (r_0) for the daughter nuclides. The ALPHAD code employs Preston′s spin-independent formalism to calculate alpha decay probabilities. A suite of databases available at the website of the National Nuclear Data Center (NNDC), Brookhaven National Laboratory was consulted to ensure the completeness and reliability of available experimental data pertaining to alpha decays of all the even-even nuclides in the entire nuclear landscape. The literature available up to June 2020 has been consulted. In addition to updating Q_α values, half-lives, and other relevant quantities for all the even-even alpha emitters, 26 new even-even alpha emitters, and 164 references published since 1997, mostly in primary nuclear physics journals, have been added to the previous evaluation by Y.A. Akovali [1] in 1998, with a literature cutoff date of January 1997. We also present systematics of r_0 parameters for even-even nuclides, and find that the radius parameters in an isotopic chain exhibit a regular pattern as a function of parent neutron number, showing a minimum at major closed shells, e.g. at N=126, increasing sharply above the closed shells, followed by a smoothly decreasing trend towards the next shell closure. The r_0 parameters for even-even nuclides can be used as input parameters to calculate hindrance factors for the alpha decay of odd-A and odd-odd nuclides. We have also modified the original ALPHAD code so that the r_0 parameters for the odd-A and the odd-odd nuclei can be automatically calculated using the present data file for r_0 parameters of even-even daughter nuclides.

CONTENTS

I. INTRODUCTION

Preston′s spin-independent formulation of 1947 [2] is one of the original theoretical frameworks proposed to explain and quantify alpha radioactivity. This model was formulated by considering a preformed alpha particle inside a nucleus having a rectangular potential well of depth V_0, where V_0 = constant for $r < r_0$, r is the distance from the center of the daughter nucleus and r_0 is the radius of the daughter nucleus [2]. The field beyond an effective nuclear radius was assumed to be generated by a Coulomb potential ($2Ze^2/r$, where Z is the atomic number of the daughter nucleus and e is the elementary charge) between the alpha particle and the daughter nucleus. The radius parameter calculated in the present study is related to nuclear radius $R = r_0\ A^{1/3}$; however, this calculated value of r_0 parameter lies in the range of 1.4-1.6 *fm*, which is different from the generally accepted value of 1.2 *fm*. The difference may be due to constraining the alpha hindrance factor of 1.0 for the ground-state to ground-state alpha transitions in even-even nuclei [1].

Accessibility of high-performance computing resources and refinements in the nuclear potential has led to various macroscopic approaches, such as cluster models [3–7], generalized liquid drop model [8, 9], unified fission

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model [10], density dependent M3Y effective interaction [11–14], etc., which have been employed to calculate theoretical half-lives for alpha emitters in various mass regions, all the way up to the heaviest nuclei experimentally discovered so far. Additionally, some microscopic approaches based on the shell model and fission models [13–17] have also been used to analyze alpha decay data. Semi-empirical formulations proposed by Viola and Seaborg [18], Royer [19, 20], Parkhomenko and Sobiczewski [21], and others [22–27] have been successfully employed to analyze alpha-decay energies to reproduce experimental α-decay half-lives of heavy and superheavy nuclei. The calculated alpha-decay energies (Q_α) and theoretical half-lives ($T_{1/2}$) using above-mentioned approaches generally depend on the fitting procedures, tuning of the nuclear potential, and associated adjustable parameters; hence, we do not prefer these theoretical Q_α and $T_{1/2}$ values in the present analysis of nuclear radius parameters (r_0).

Rasmussen [28] derived a more realistic potential using optical model analysis of elastic scattering data, and calculated barrier penetration factors by numerical integration in the WKB approximation. The model potential includes centrifugal barrier effects but ignores the non-central component of nuclear interactions. This approach is adopted by many researchers to deduce experimental reduced α-decay widths relative to the ground state to ground state α-transitions in even-even and odd-A nuclei [29–31]. These reduced widths exhibit similar patterns at major shell closures as shown by the nuclear radius parameters obtained by us (see e.g., Fig. 1). Although alpha decay widths deduced from Rasmussen′s approach [28] exhibit the same pattern as shown by the radius parameters, the validity of this approach depends upon the nature of the potential (beyond the outermost turning point) [32] and range of mean lifetime (τ) [32, 33], which prompted us to keep Preston′s spin-independent formulation [2], as in the previous review by Y.A. Akovali [1].

The r_0 parameters calculated in the present study can further be used to deduce the hindrance factors (HFs) - the ratio of experimental to theoretical partial half-lives of given alpha transitions. The alpha transitions for which HFs lie between 1 and 4 are called favored transitions, and take place between nuclear states having similar configurations, and hence, these HFs can be used to ascertain spin-parity assignments for a given daughter (parent) state if those of the parent (daughter) are known [34]. Additionally, the systematics of alpha-decay HFs can be used to deduce a variety of quantities such as total alpha branching, intensities of unobserved alpha groups, excitation energy of the level fed in daughter nucleus, and nuclear structure characteristics, but such a study is outside the scope of the present work.

II. METHODOLOGY AND RESULTS

In the present study, the spin-independent part of Preston′s equations [2] are used for the alpha decay probabilities. This formalism contains the radius of the daughter nuclide, r_0 , as a free parameter [2, 35]. By setting HF=1 for the ground-state to ground-state alpha branch for an even-even nuclide [1], the radius parameter for the daughter nuclide can be extracted.

In order to deduce r_0 parameters, the Evaluated Nuclear Structure Data File (ENSDF) analysis code ALPHAD [36] was used, which also calculates theoretical half-lives and Hindrance Factors(HFs) for excited states α-branches by assuming HF=1.0 for ground-state to ground-state α transitions [2]. The experimental quantities required to calculate r_0 parameter using this program are: energy available for α-decay (Q_α), half-life ($T_{1/2}$) of the parent nuclide, branching ratio (%α) for alpha-decay mode, and alpha intensity (I_α) for ground-state to ground-state α-transition. The ENSDF, eXperimental Unevaluated Nuclear Data List (XUNDL), Nuclear Science References (NSR), and NUBASE-2016 databases [37–39] were consulted to ensure that, in our input data files, we have covered all the relevant and available experimental data for the quantities listed above to current date.

The deduced r_0 parameters for 186 even-even alpha decays (ground state to ground state) are presented in Table I, including 26 new even-even alpha emitters added to the previous evaluation [1], while the details of the evaluated quantities and deduced radius parameters are provided in Table II. It should be pointed out that for the reported ^{104}Te alpha decay [40] to ^{100}Sn, the $T_{1/2}$ (< 18 ns) is given as an upper limit, with no estimate of a lower bound, so the calculated radius parameter for the upper limit $T_{1/2}$ = 18 ns is > 1.77 *fm*. Moreover, a recent experimental study [41] casts doubt on the existence of this decay mode as they could assign only two tentative events to the ^{108}Xe → ^{104}Te → ^{100}Sn decay chain in their experiment, and $T_{1/2}$ (< 4 ns) for ^{104}Te α decay. For the ^{198}Hg and the ^{106}Sn daughter nuclides, the values of %α = 7.6x10^{-4} [42] (for ^{106}Sn) and < 1 [43](for ^{198}Hg) are not experimental values, and calculated radius parameters 1.604(41) *fm* for ^{106}Sn and 1.510 *fm* for ^{198}Hg are based on %α=7.6x10^{-4} and %α = 1, respectively. Due to the tentative nature of the deduced radius parameters for these three nuclei, these values are not included in Table I, Table II, and the systematics presented in Fig. 1 and Figs.2−6.

Global systematics of r_0 parameters with neutron number of parents for different nuclides are presented in Fig. 1, and by Z number of parents in Figs.2−6. These figures show that the radius parameters lie on fairly smooth curves with exceptions at major and minor shell closures. In other words, the calculated r_0 parameters for all the daughter nuclides decrease gradually with increasing parent neutron number between neighboring closed shells, exhibiting a minimum at N(parent)=126 (a major shell closure), and increase thereafter, decreasing again toward the next major shell. Fig. 1 clearly shows that there is a shallow minimum at N(parent)=152, which indicates a minor shell closure, consistent with the recent mapping of N=152 shell effects in Ref. [42].

III. DISCUSSION

It is appropriate to discuss the behavior of the deformed actinides from Th to Cf parent nuclei, as shown in Fig. 7. Thorium isotopes touch N(parent)=126 on the extreme left and show a sharp dip at N(parent)=126, as expected. However, the behavior of these nuclides from Th to Cf after N(parent)=126 is different and interesting. These isotopic chains display a sequence of minima, not all of them accessible in each chain of the isotopes. But the Th, U and Pu isotopes display two minima, which keep shifting by two neutrons to the right. These minima lie at N=134 and 140 for Th, at N=136 and 142 for U, and at N=138 and 144 for Pu. Due to large error bars at N=138 minimum of Pu (Fig. 7), this minimum is questionable but N=144 is a definite minimum. Thereafter, Pu and Cm have a minimum at N=150, and Fm, Cf at N=152. It is, therefore, clear that the much discussed N=152 minimum is also a transient minimum. This behavior of shifting minima for these heavy nuclides is interesting and, in our view, has not yet been explored in the literature and explained on the basis of theoretical considerations.

For light lead isotopes, whether Z=82 is a good magic number or not remains an open question in the literature [3, 30, 43, 44]. On the basis of shell model calculations, Wauters *et al.* [30] showed that Z=82 is a good magic number, but on the other hand Buck *et al.* [3, 43] and Brown [44] suggested the disappearance of Z=82 shell closure. In order to investigate the magicity of Z=82 proton shell closure, we present in Fig. 8 the systematics of the r_0 parameter as a function of parent proton number for six isotonic chains with parent neutron numbers N=102, 104, 106, 108, 110 and 112. This figure shows that the isotonic chains with N=104, 106 and 112 exhibit a minimum at Z=82, which indicates the role of Z=82 proton shell closure, consistent with the shell model prediction of Wauters *et al.* [30]. However, the shell effect at Z=82 disappears for the isotonic chains with N=102, 108 and 110 as suggested by Buck *et al.* [3, 43] and Brown [44]. Further calculations are required to elucidate the issue of the Z=82 proton shell closure.

IV. ALPHAD_RadD CODE

As discussed above, in the present study, radius parameters of even-even alpha emitters were calculated using Preston's formula for alpha decay transition probabilities [2, 35] and using the analysis code ALPHAD [36]. The evaluated radius parameters from Table I can further be used to deduce r_0 parameters of odd-A and odd-odd nuclides by interpolation or extrapolation as discussed by M.J. Martin [45]. The evaluated radius parameters can be used to deduce hindrance factors for alpha-fed excited states in even-even nuclides and for alpha-fed ground and excited states in odd-A and odd-odd nuclides, all relative to HF=1 for the even-even ground-state alpha branch, which provide tools to extract spectroscopic information about spins and parities of nuclear states, as well as rotational band structures in deformed nuclei.

The original program ALPHAD [36] has been extended to automatically deduce the radius parameters and calculate the corresponding hindrance factors for the odd-A and odd-odd nuclides using the r_0 values from Table I. The new program is ALPHAD_RadD [46]. Additionally, the code provides an option of inputting a user-supplied radius parameter.

V. CONCLUSIONS

We present an updated evaluation of nuclear radius parameters of 186 even-even nuclides lying in the region Z = 50 - 116 and N = 52 - 174 (^{102}Sn - ^{290}Lv) from the analysis of all the even-even alpha emitters. This includes 26 new even-even alpha emitters, and 164 additional references published since the previous such evaluation by Y.A. Akovali [1] in 1998. Plots of systematics reveal that the nuclear radius parameter of isotopic chains decreases gradually with increasing parent neutron number between neighboring closed shells, exhibiting a minimum at N(parent)=126 (a major shell closure), and increases thereafter, decreasing again toward the next major shell. Another interesting behavior regarding "shifting minimum"in Th, U, Pu, Cm, Cf and Fm isotopes, which indicates the transient nature of the N=152 shell closure, is also identified. An issue pertaining to the disappearance of Z=82 proton shell closure in neutron deficient lead isotopes is also discussed. We believe that the present work on updated r_0 parameters for even-even nuclei and the revised ALPHAD_RadD code will facilitate the evaluation of alpha decay data sets for the ENSDF database, through an automatic calculation of the radius paramaters and hindrance factors for all the α emitters.

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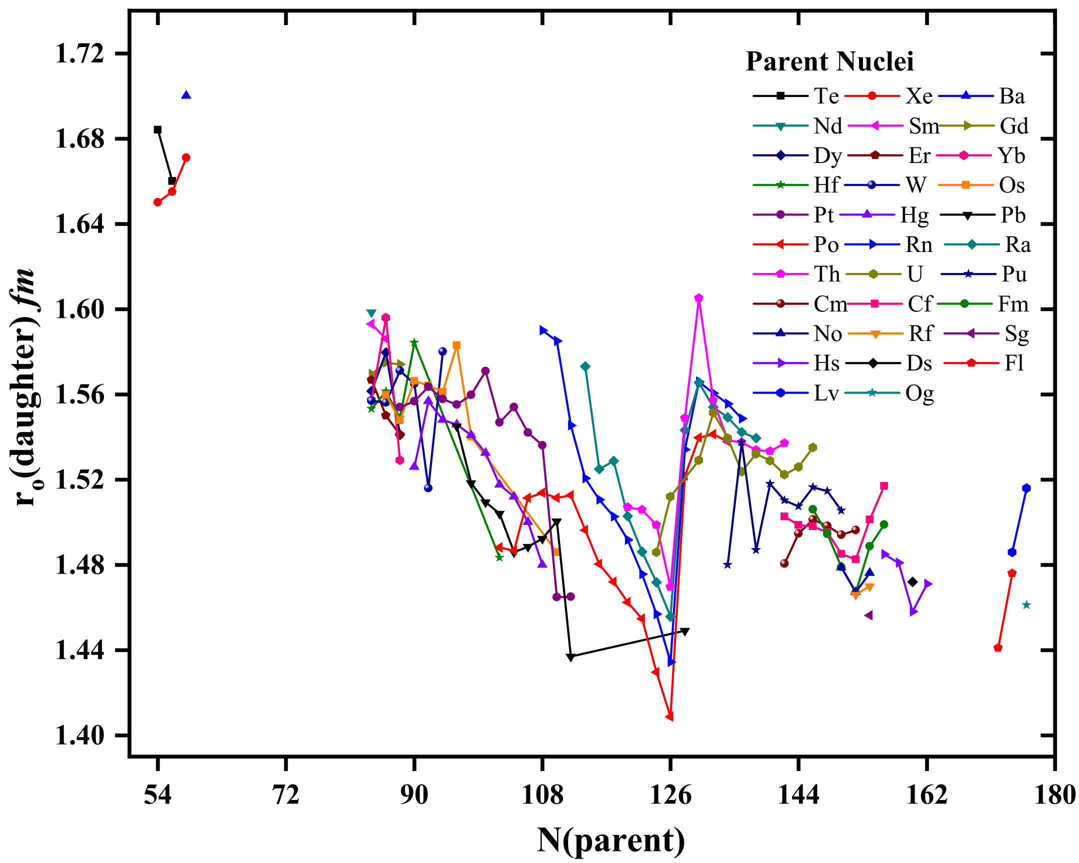

FIG. 1. (Color online) Systematics of r_0 parameters as a function of parent neutron number for different Z chains listed in Table I.

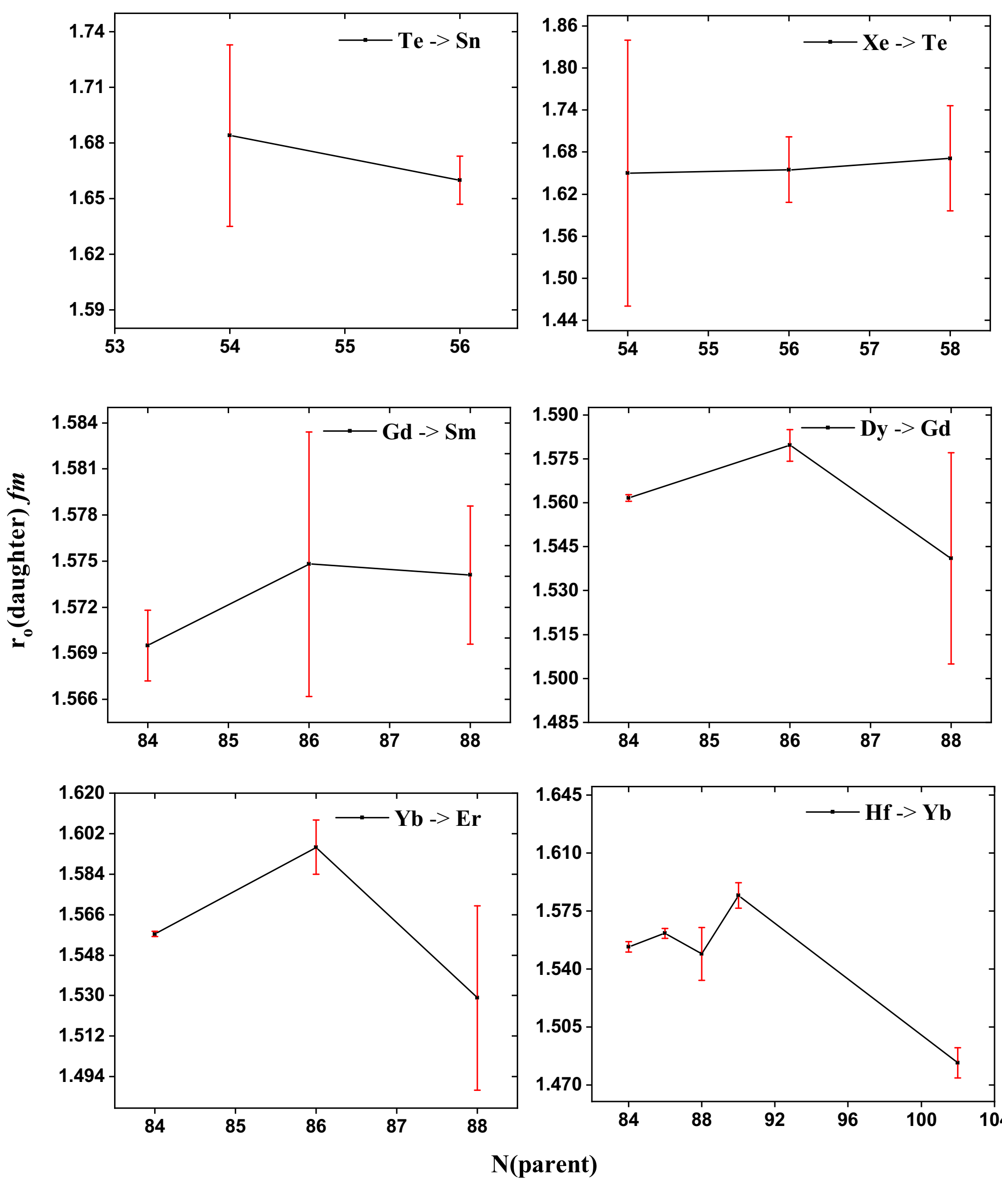

FIG. 2. (Color online) Systematics of r_0 parameter with parent neutron number for Te, Xe, Gd, Dy, Yb and Hf nuclides. The overall uncertainties in r_0 is indicated with error bars and determined by propagating all the relevant uncertainties within the operation of the ALPHAD code [36].

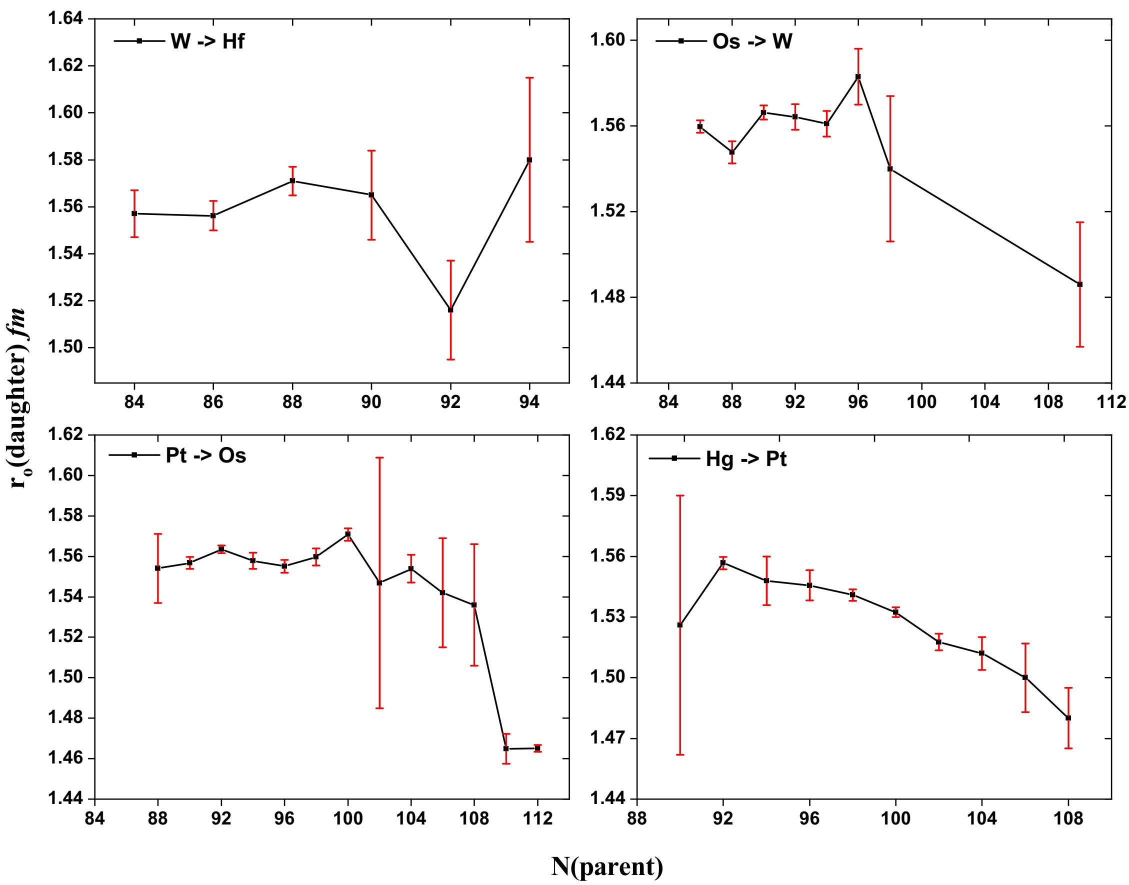

FIG. 3. (Color online) Same as Fig. 2 but for W, Os, Pt and Hg nuclides.

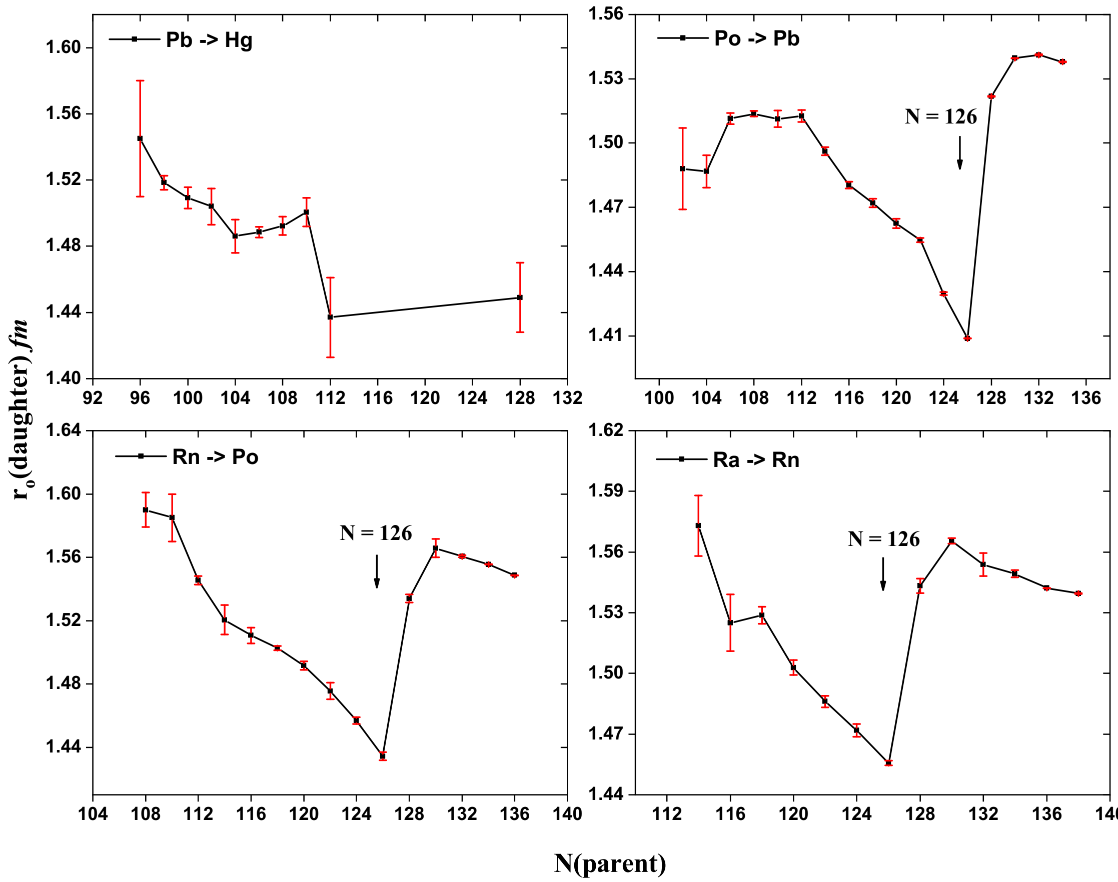

FIG. 4. (Color online) Same as Fig. 2 but for Pb, Po, Rn and Ra nuclides. The major shell closure at N=126 is indicated with an arrow.

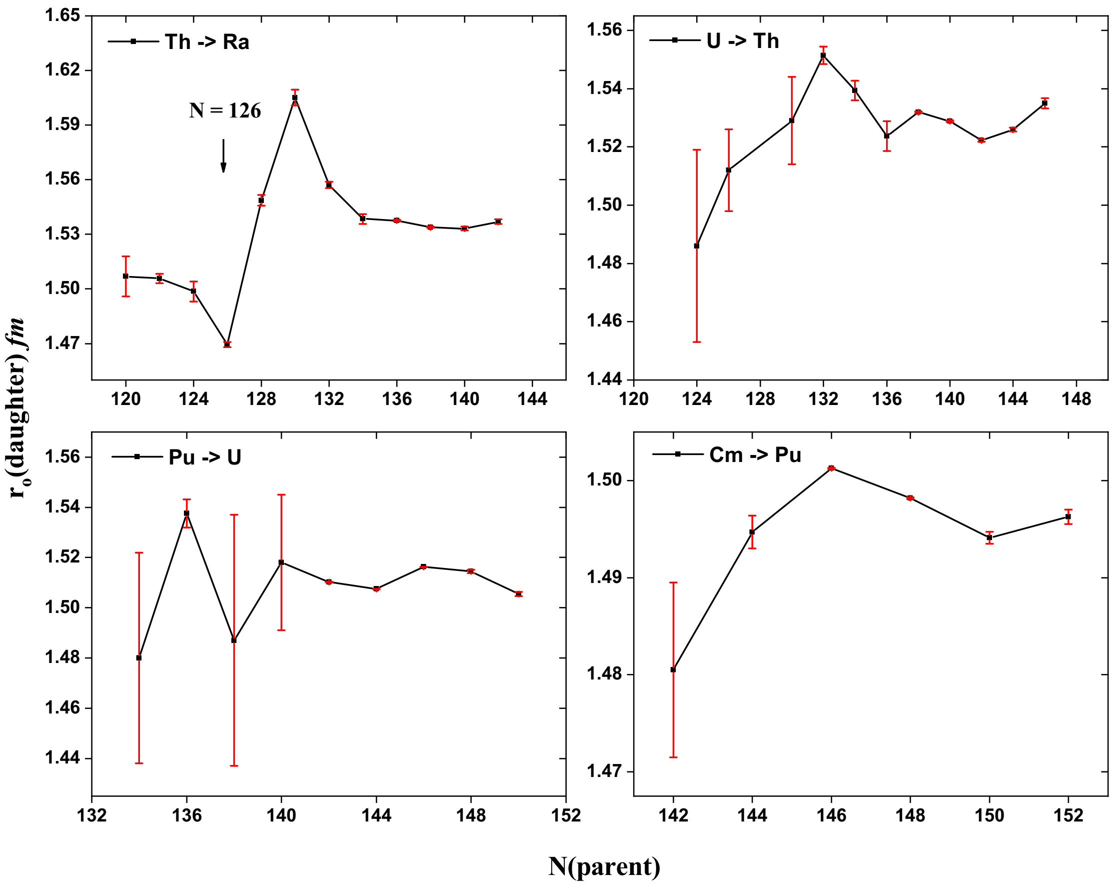

FIG. 5. (Color online) Same as Fig. 2 but for Th, U, Pu and Cm nuclides. The major shell closure at N=126 is indicated with an arrow.

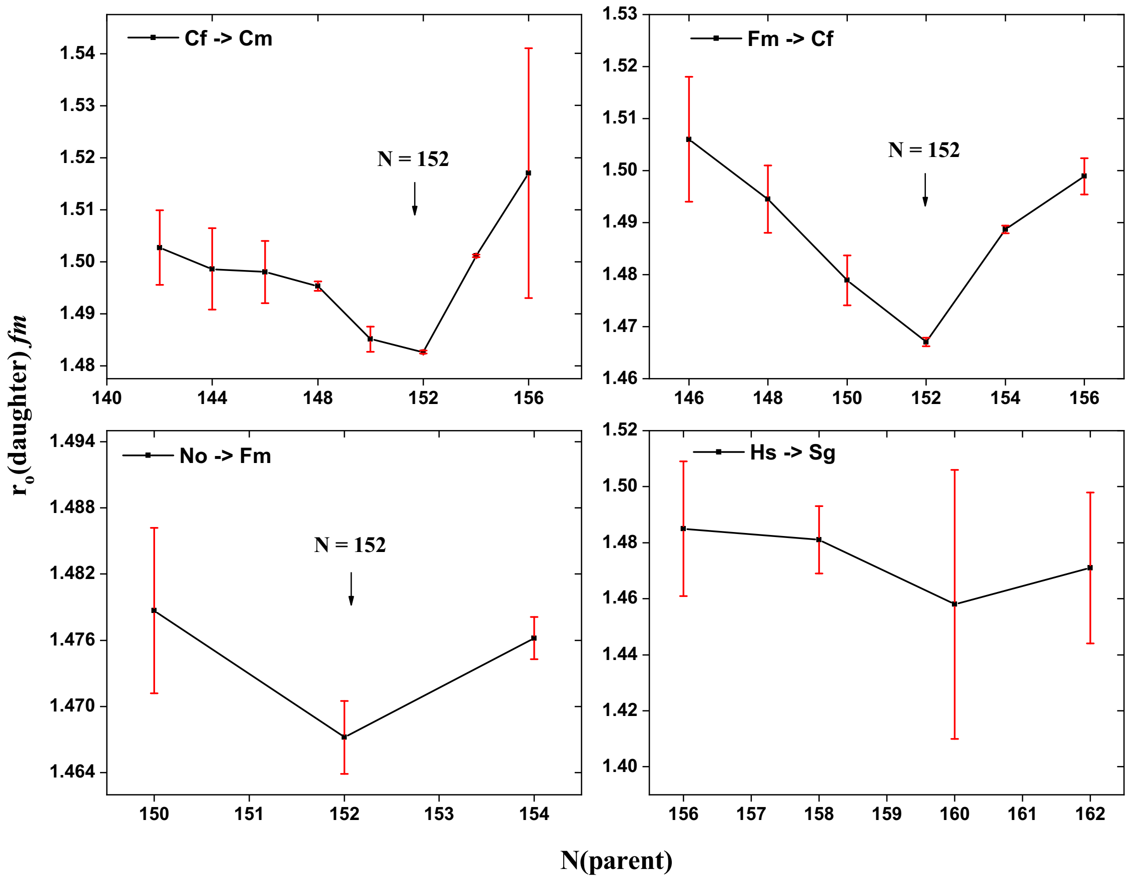

FIG. 6. (Color online) Same as Fig. 2 but for Cf, Fm, No and Hs nuclides. The minor shell closure at N=152 is indicated with an arrow.

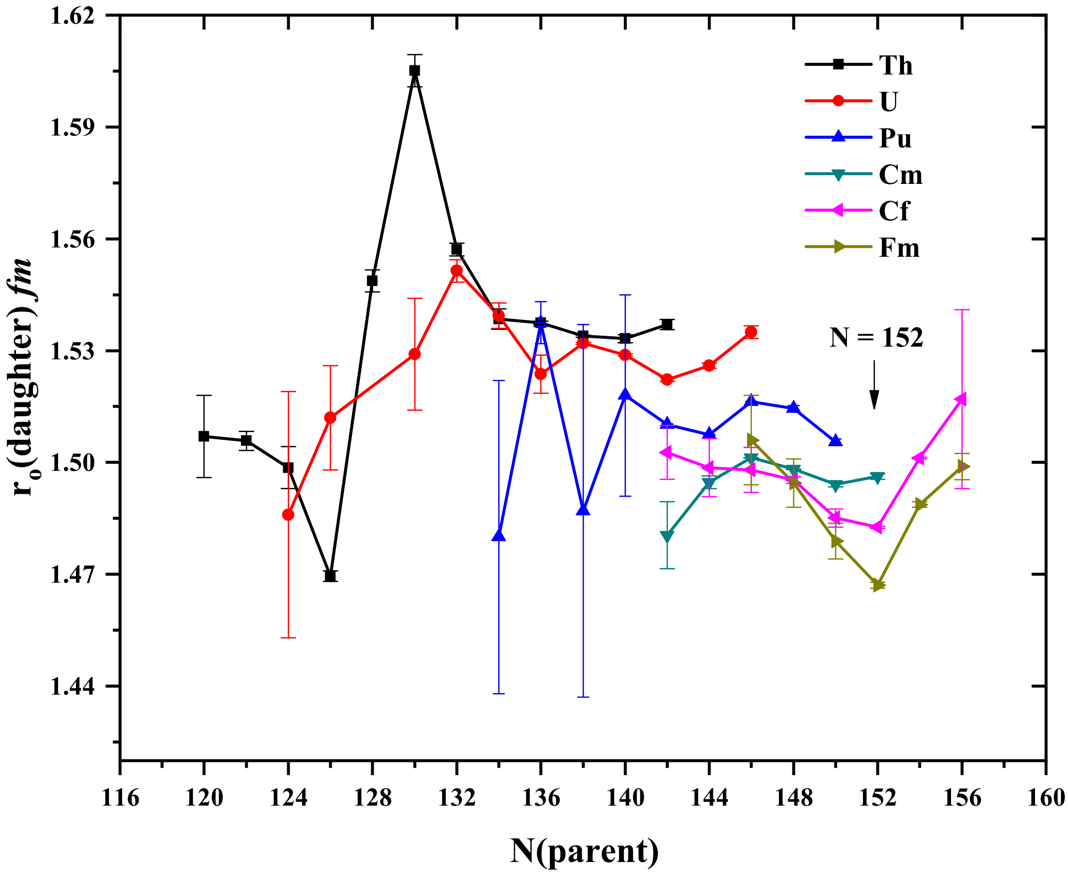

FIG. 7. (Color online) Same as Fig. 1 but for deformed actinides from Th to Cf. The Th, U and Pu nuclides exhibit shifting of minimum by two neutrons and the transient minimum at N=152 [42] is indicated by an arrow.

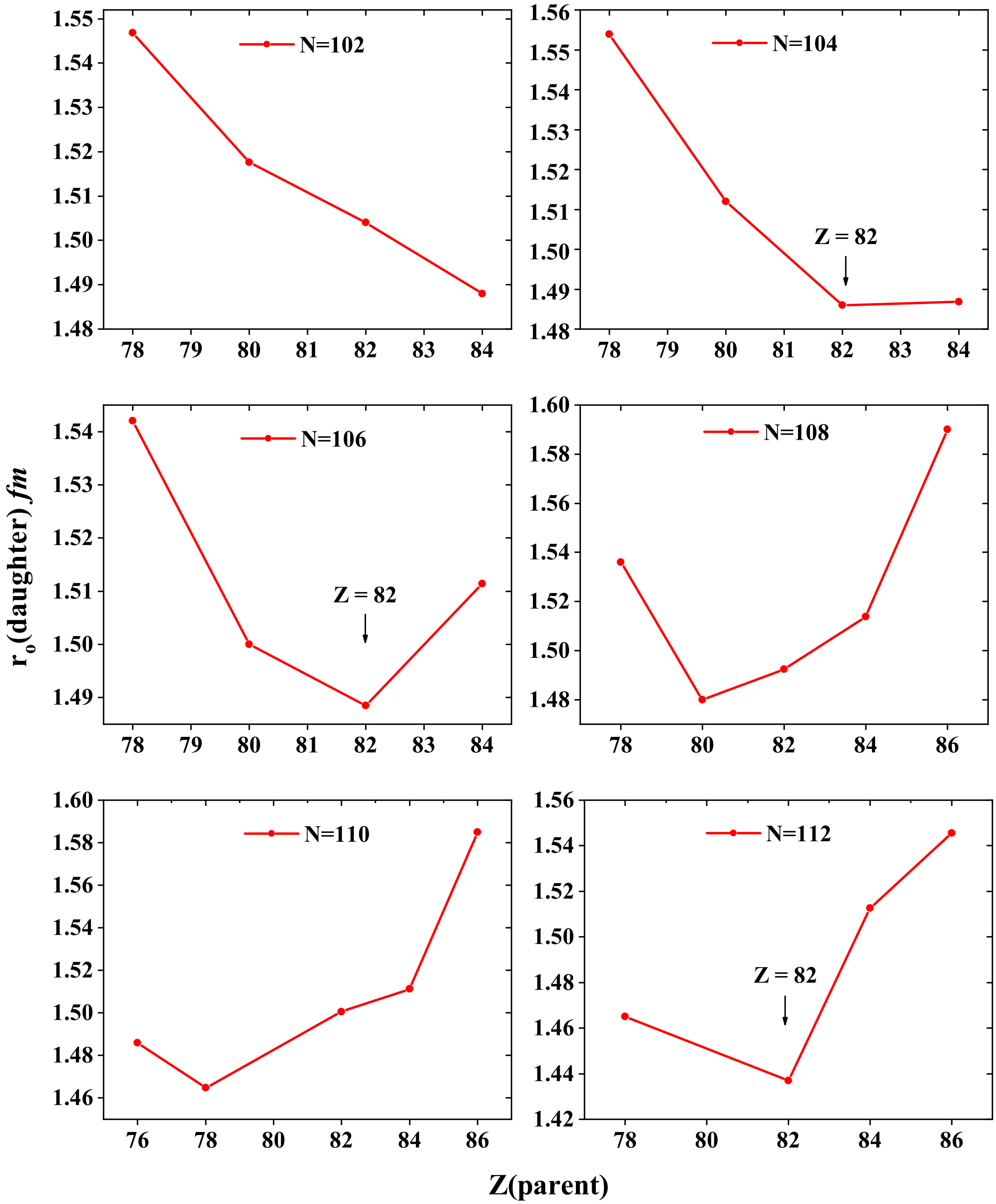

FIG. 8. (Color online) Systematics of r_0 parameter as function of parent proton number for N(parent)=102, 104, 106, 108, 110 and 112 isotones. The major shell closure at Z=82, wherever observed, is indicated with an arrow.

TABLE I: List of extracted radius parameters (r_0) for even-even daughter nuclei. The quoted uncertainty is in the last significant digits.

Parent Nuclide				Daughter Nuclide				Daughter r_0
Element	Z	N	A	Element	Z	N	A	(fm)
Te	52	54	106	Sn	50	52	102	1.684(49)
	52	56	108		50	54	104	1.660(13)
Xe	54	54	108	Te	52	52	104	1.65(19)
	54	56	110		52	54	106	1.655(47)
	54	58	112		52	56	108	1.671(75)
Ba	56	58	114	Xe	54	56	110	1.700(47)
Nd	60	84	144	Ce	58	82	140	1.5986(81)
Sm	62	84	146	Nd	60	82	142	1.5930(74)
	62	86	148		60	84	144	1.586(12)
Gd	64	84	148	Sm	62	82	144	1.5695(23)
	64	86	150		62	84	146	1.5748(86)
	64	88	152		62	86	148	1.5741(45)
Dy	66	84	150	Gd	64	82	146	1.5616(12)
	66	86	152		64	84	148	1.5796(54)
	66	88	154		64	86	150	1.541(36)
Er	68	84	152	Dy	66	82	148	1.5667(27)
	68	86	154		66	84	150	1.550(16)
	68	88	156		66	86	152	1.541(26)
Yb	70	84	154	Er	68	82	150	1.5574(12)
	70	86	156		68	84	152	1.596(12)
	70	88	158		68	86	154	1.529(41)
Hf	72	84	156	Yb	70	82	152	1.5532(31)
	72	86	158		70	84	154	1.5614(31)
	72	88	160		70	86	156	1.549(16)
	72	90	162		70	88	158	1.5842(77)
	72	102	174		70	100	170	1.4833(91)
W	74	84	158	Hf	72	82	154	1.557(10)
	74	86	160		72	84	156	1.5562(63)
	74	88	162		72	86	158	1.5710(61)
	74	90	164		72	88	160	1.565(19)
	74	92	166		72	90	162	1.516(21)
	74	94	168		72	92	164	1.580(35)
Os	76	86	162	W	74	84	158	1.5597(29)
	76	88	164		74	86	160	1.5477(44)
	76	90	166		74	88	162	1.5663(32)
	76	92	168		74	90	164	1.5642(59)
	76	94	170		74	92	166	1.5611(60)
	76	96	172		74	94	168	1.583(13)
	76	98	174		74	96	170	1.540(34)
	76	110	186		74	108	182	1.486(29)
Pt	78	88	166	Os	76	86	162	1.554(17)
	78	90	168		76	88	164	1.5568(29)
	78	92	170		76	90	166	1.5636(19)
	78	94	172		76	92	168	1.5578(40)
	78	96	174		76	94	170	1.5551(32)
	78	98	176		76	96	172	1.5597(42)
	78	100	178		76	98	174	1.5708(31)
	78	102	180		76	100	176	1.5468(62)
	78	104	182		76	102	178	1.5539(68)
	78	106	184		76	104	180	1.542(27)
	78	108	186		76	106	182	1.536(30)
	78	110	188		76	108	184	1.4648(74)
	78	112	190		76	110	186	1.4651(16)
Hg	80	90	170	Pt	78	88	166	1.526(64)
	80	92	172		78	90	168	1.5567(30)
	80	94	174		78	92	170	1.548(12)
	80	96	176		78	94	172	1.5457(75)
	80	98	178		78	96	174	1.5409(29)
	80	100	180		78	98	176	1.5324(24)

Continuation of Table I

Parent Nuclide				Daughter Nuclide				Daughter r_0
Element	Z	N	A	Element	Z	N	A	(fm)
Hg	80	102	182	Pt	78	100	178	1.5176(41)
	80	104	184		78	102	180	1.5120(81)
	80	106	186		78	104	182	1.500(17)
	80	108	188		78	106	184	1.480(15)
Pb	82	96	178	Hg	80	94	174	1.545(35)
	82	98	180		80	96	176	1.5184(43)
	82	100	182		80	98	178	1.5093(64)
	82	102	184		80	100	180	1.504(11)
	82	104	186		80	102	182	1.486(10)
	82	106	188		80	104	184	1.4885(32)
	82	108	190		80	106	186	1.4923(55)
	82	110	192		80	108	188	1.5005(86)
	82	112	194		80	110	190	1.437(24)
	82	128	210		80	126	206	1.449(21)
Po	84	102	186	Pb	82	100	182	1.488(19)
	84	104	188		82	102	184	1.4868(76)
	84	106	190		82	104	186	1.5114(26)
	84	108	192		82	106	188	1.5137(13)
	84	110	194		82	108	190	1.5113(39)
	84	112	196		82	110	192	1.5126(28)
	84	114	198		82	112	194	1.4962(19)
	84	116	200		82	114	196	1.4803(16)
	84	118	202		82	116	198	1.4720(20)
	84	120	204		82	118	200	1.4625(22)
	84	122	206		82	120	202	1.4547(10)
	84	124	208		82	122	204	1.42967(74)
	84	126	210		82	124	206	1.408790(38)
	84	128	212		82	126	208	1.52177(18)
	84	130	214		82	128	210	1.539616(24)
	84	132	216		82	130	212	1.54117(28)
	84	134	218		82	132	214	1.53788(19)
Rn	86	108	194	Po	84	106	190	1.590(11)
	86	110	196		84	108	192	1.585(15)
	86	112	198		84	110	194	1.5455(27)
	86	114	200		84	112	196	1.5205(93)
	86	116	202		84	114	198	1.5106(49)
	86	118	204		84	116	200	1.5026(13)
	86	120	206		84	118	202	1.4917(27)
	86	122	208		84	120	204	1.4755(52)
	86	124	210		84	122	206	1.4568(22)
	86	126	212		84	124	208	1.4343(25)
	86	128	214		84	126	210	1.5340(25)
	86	130	216		84	128	212	1.5658(59)
	86	132	218		84	130	214	1.56062(74)
	86	134	220		84	132	216	1.55548(10)
	86	136	222		84	134	218	1.54863(17)
Ra	88	114	202	Rn	86	112	198	1.573(15)
	88	116	204		86	114	200	1.525(14)
	88	118	206		86	116	202	1.5287(42)
	88	120	208		86	118	204	1.5029(36)
	88	122	210		86	120	206	1.4861(29)
	88	124	212		86	122	208	1.4718(31)
	88	126	214		86	124	210	1.4557(12)
	88	128	216		86	126	212	1.5433(36)
	88	130	218		86	128	214	1.5655(13)
	88	132	220		86	130	216	1.5539(57)
	88	134	222		86	132	218	1.5492(18)
	88	136	224		86	134	220	1.542177(86)
	88	138	226		86	136	222	1.53945(26)
Th	90	120	210	Ra	88	118	206	1.507(11)

Continuation of Table I

Parent Nuclide				Daughter Nuclide				Daughter r_0
Element	Z	N	A	Element	Z	N	A	(fm)
Th	90	122	212	Ra	88	120	208	1.5058(26)
	90	124	214		88	122	210	1.4986(56)
	90	126	216		88	124	212	1.4695(14)
	90	128	218		88	126	214	1.5487(30)
	90	130	220		88	128	216	1.6051(43)
	90	132	222		88	130	218	1.5571(17)
	90	134	224		88	132	220	1.5385(27)
	90	136	226		88	134	222	1.53749(45)
	90	138	228		88	136	224	1.53389(32)
	90	140	230		88	138	226	1.5332(11)
	90	142	232		88	140	228	1.5370(14)
U	92	124	216	Th	90	122	212	1.486(33)
	92	126	218		90	124	214	1.512(14)
	92	130	222		90	128	218	1.529(15)
	92	132	224		90	130	220	1.5514(30)
	92	134	226		90	132	222	1.5394(34)
	92	136	228		90	134	224	1.5237(51)
	92	138	230		90	136	226	1.53197(29)
	92	140	232		90	138	228	1.52885(29)
	92	142	234		90	140	230	1.52224(49)
	92	144	236		90	142	232	1.52595(66)
	92	146	238		90	144	234	1.5350(17)
Pu	94	134	228	U	92	132	224	1.480(42)
	94	136	230		92	134	226	1.5375(56)
	94	138	232		92	136	228	1.487(50)
	94	140	234		92	138	230	1.518(27)
	94	142	236		92	140	232	1.51022(22)
	94	144	238		92	142	234	1.50745(13)
	94	146	240		92	144	236	1.51631(11)
	94	148	242		92	146	238	1.51448(75)
	94	150	244		92	148	240	1.50549(82)
Cm	96	142	238	Pu	94	140	234	1.4805(90)
	96	144	240		94	142	236	1.4947(17)
	96	146	242		94	144	238	1.501258(57)
	96	148	244		94	146	240	1.498180(88)
	96	150	246		94	148	242	1.49412(62)
	96	152	248		94	150	244	1.49627(74)
Cf	98	142	240	Cm	96	140	236	1.5027(72)
	98	144	242		96	142	238	1.4986(78)
	98	146	244		96	144	240	1.498(60)
	98	148	246		96	146	242	1.49528(88)
	98	150	248		96	148	244	1.4851(24)
	98	152	250		96	150	246	1.48260(30)
	98	154	252		96	152	248	1.50113(23)
	98	156	254		96	154	250	1.517(24)
Fm	100	146	246	Cf	98	144	242	1.506(12)
	100	148	248		98	146	244	1.4945(65)
	100	150	250		98	148	246	1.4789(48)
	100	152	252		98	150	248	1.46703(81)
	100	154	254		98	152	250	1.48871(75)
	100	156	256		98	154	252	1.4989(35)
No	102	150	252	Fm	100	148	248	1.4787(75)
	102	152	254		100	150	250	1.4672(33)
	102	154	256		100	152	252	1.4762(19)
Rf	104	152	256	No	102	150	252	1.466(26)
	104	154	258		102	152	254	1.470(18)
Sg	106	154	260	Rf	104	152	256	1.4562(75)
Hs	108	156	264	Sg	106	154	260	1.485(24)
	108	158	266		106	156	262	1.481(12)
	108	160	268		106	158	264	1.458(48)

Continuation of Table I

Parent Nuclide				Daughter Nuclide				Daughter r_0
Element	Z	N	A	Element	Z	N	A	(fm)
Hs	108	162	270	Sg	106	160	266	1.471(27)
Ds	110	160	270	Hs	108	158	266	1.472(12)
Fl	114	172	286	Cn	112	170	282	1.441(15)
	114	174	288		112	172	284	1.476(10)
Lv	116	174	290	Fl	114	172	286	1.486(28)
	116	176	292		114	174	288	1.516(18)
Og	118	176	294	Lv	116	174	290	1.461(24)

[1] Y. A. Akovali, "Review of alpha-decay data from doubly-even nuclei," NUCL. DATA SHEETS **84**, 1 (1998).
[2] M. A. Preston, "The theory of alpha-radioactivity," PHYS. REV. **71**, 865 (1947).
[3] B. Buck, A. C. Merchant, and S. M. Perez, "α decay calculations with a realistic potential," PHYS. REV. C **45**, 2247 (1992).
[4] B. Buck, A. C. Merchant, and S. M. Perez, "Half-lives of favored alpha decays from nuclear ground states," AT. DATA NUCL. DATA TABLES **54**, 53 (1993).
[5] C. Xu and Z. Ren, "Global calculation of α-decay half-lives with a deformed density-dependent cluster model," PHYS. REV. C **74**, 014304 (2006).
[6] J. C. Pei, F. R. Xu, Z. J. Lin, and E. G. Zhao, "α-decay calculations of heavy and superheavy nuclei using effective mean-field potentials," PHYS. REV. C **76**, 044326 (2007).
[7] Y. Qian, Z. Ren, and D. Ni, "Calculations of α-decay half-lives for heavy and superheavy nuclei," PHYS. REV. C **83**, 044317 (2011).
[8] H. Zhang, W. Zuo, J. Li, and G. Royer, "α decay half-lives of new superheavy nuclei within a generalized liquid drop model," PHYS. REV. C **74**, 017304 (2006).
[9] J. Dong, H. Zhang, Y. Wang, W. Zuo, and J. Li, "Alpha-decay for heavy nuclei in the ground and isomeric states," NUCL. PHYS. A **832**, 198 (2010).
[10] J. Dong, W. Zuo, J. Gu, Y. Wang, and B. Peng, "α-decay half-lives and Q_α values of superheavy nuclei," PHYS. REV. C **81**, 064309 (2010).
[11] D. N. Basu, "Role of effective interaction in nuclear disintegration processes," PHYS. LETT. B **566**, 90 (2003).
[12] P. R. Chowdhury, D. N. Basu, and C. Samanta, "α decay chains from element 113," PHYS. REV. C **75**, 047306 (2007).
[13] P. R. Chowdhury, C. Samanta, and D. N. Basu, "Nuclear half-lives for α-radioactivity of elements with $100 \leq Z \leq 130$," AT. DATA NUCL. DATA TABLES **94**, 781 (2008).
[14] C. Samanta, P. R. Chowdhury, and D. N. Basu, "Predictions of alpha decay half lives of heavy and superheavy elements," NUCL. PHYS. A **789**, 142 (2007).
[15] K. Harada, "Alpha-particle reduced widths in heavy nuclei," PROG. THEOR. PHYS. **26**, 667 (1961).
[16] K. Varga, R. G. Lovas, and R. J. Liotta, "Absolute alpha decay width of ^{212}Po in a combined shell and cluster model," PHYS. REV. LETT. **69**, 37 (1992).
[17] D. N. Poenaru, R. A. Gherghescu, and W. Greiner, "Heavy-particle radioactivity of superheavy nuclei," PHYS. REV. LETT. **107**, 062503 (2011).
[18] V. E. Viola Jr and G. T. Seaborg, "Nuclear systematics of the heavy elements-II lifetimes for alpha, beta and spontaneous fission decay," J. INORG. NUCL. CHEM. **28**, 741 (1966).
[19] G. Royer, "Analytic expressions for alpha-decay half-lives and potential barriers," NUCL. PHYS. A **848**, 279 (2010).
[20] G. Royer, "Alpha emission and spontaneous fission through quasi-molecular shapes," J. PHYS. G: NUCL. PART. PHYS. **26**, 1149 (2000).
[21] A. Parkhomenko and A. Sobiczewski, "Phenomenological formula for alpha-decay half-lives of heaviest nuclei," ACTA PHYS. POL. B. **36**, 3095 (2005).
[22] Y. Ren and Z. Ren, "New geiger-nuttall law for α decay of heavy nuclei," PHYS. REV. C **85**, 044608 (2012).
[23] Y. Qian and Z. Ren, "Predictions on properties of α decay and spontaneous fission in superheavy odd-Z nuclei," PHYS. REV. C **90**, 064308 (2014).
[24] M. Bao, Z. He, Y. M. Zhao, and A. Arima, "Simple relations for α-decay energies of neighboring nuclei," PHYS. REV. C **90**, 024314 (2014).
[25] D. N. Poenaru, R. A. Gherghescu, and W. Greiner, "Simple relationships for α-decay half-lives," J. PHYS. G: NUCL. PART. PHYS. **39**, 015105 (2011).
[26] Z. Y. Wang, Z. M. Niu, Q. Liu, and J. Y. Guo, "Systematic calculations of α-decay half-lives with an improved empirical formula," J. PHYS. G: NUCL. PART. PHYS. **42**, 055112 (2015).
[27] H. C. Manjunatha, "Alpha decay properties of superheavy nuclei $Z=126$," NUCL. PHYS. A **945**, 42 (2016).
[28] J. O. Rasmussen, "Alpha-decay barrier penetrabilities with an exponential nuclear potential: even-even nuclei," PHYS. REV. **113**, 1593 (1959).
[29] K. Toth, Y. A. Ellis-Akovali, C. R. Bingham, D. M. Moltz, D. C. Sousa, H. K. Carter, R. L. Mlekodaj, and E. H. Spejewski, "Evidence from α decay that $Z = 82$ is not magic for light Pb isotopes," PHYS. REV. LETT. **53**, 1623 (1984).
[30] J. Wauters, N. Bijnens, P. Dendooven, M. Huyse, H. Y. Hwang, G. Reusen, J. von Schwarzenberg, P. Van Duppen, R. Kirchner, and E. Roeckl, "Fine structure in the alpha decay of even-even nuclei as an experimental proof for the stability of the $Z=82$ magic shell at the very neutron-deficient side," PHYS. REV. LETT. **72**, 1329 (1994).
[31] R. D. Page, P. J. Woods, R. A. Cunningham, T. Davinson, N. J. Davis, A. N. James, K. Livingston, P. J. Sellin, and A. C. Shotter, "Radioactivity of neutron deficient isotopes in the region $N \leq 82 \leq Z$," PHYS. REV. C **53**,

660 (1996).

[32] S. Mahadevan, P. Prema, C. S. Shastry, and Y. K. Gambhir, "Comparison of S-matrix and WKB methods for half-width calculations," PHYS. REV. C **74**, 057601 (2006).

[33] C. S. Shastry, S. Mahadevan, and K. Aditya, "Unified approach to alpha decay calculations," PRAMANA **82**, 867 (2014).

[34] M. J. Martin, "Guidelines for Evaluators." Appendix A, page 52 (October 2019). To be published as an Oak Ridge National Laboratory report.

[35] R. B. Firestone, "Table of isotopes, 8^{th} Ed." V.S. Shirley, C.M. Baglin, S.Y.F. Chu, J. Zipkin Eds., John Wiley and Sons, Inc., New York Vol. II (1996).

[36] T. W. Burrows, "ALPHAD code: A program to calculate alpha hindrance factors and theoretical half-lives, version V2d ." available through `www − nds.iaea.org/public/ensdf_pgm/` (2018).

[37] "Evaluated Nuclear Structure Data File (ENSDF), eXperimental Unevaluated Nuclear Data List (XUNDL), Nuclear Science References (NSR) databases maintained by National Nuclear Data Center (NNDC), Brookhaven National Laboratory (BNL), Upton, New York, USA." available at `www.nndc.bnl.gov`.

[38] G. Audi, F. G. Kondev, M. Wang, W. J. Huang, and S. Naimi, "The $NUBASE$2016 evaluation of nuclear properties," CHIN. PHYSICS C **41**, 030001 (2017).

[39] M. Wang, G. Audi, F. G. Kondev, W. J. Huang, S. Naimi, and X. Xu, "The AME2016 atomic mass evaluation (II). tables, graphs and references," CHIN. PHYS. C **41**, 030003 (2017).

[40] K. Auranen, D. Seweryniak, M. Albers, A. Ayangeakaa, S. Bottoni, and others., "Superallowed decay to doubly magic ^{100}Sn," PHYS. REV. LETT. **121**, 182501 (2018).

[41] Y. Xiao, S. Go, R. Grzywacz, R. Orlandi, A. Andreyev, M. Asai, *et al.*, "Search for decay of ^{104}Te with a novel recoil-decay scintillation detector," PHYS. REV. C **100**, 034315 (2019).

[42] E. M. Ramirez, D. Ackermann, K. Blaum, *et al.*, "Direct mapping of nuclear shell effects in the heaviest elements," SCI. **337**, 1207 (2012).

[43] B. Buck, A. C. Merchant, and S. M. Perez, "New look at α decay of heavy nuclei," PHYS. REV. LETT. **65**, 2975 (1990).

[44] B. A. Brown, "Simple relation for alpha decay half-lives," PHYS. REV. C **46**, 811 (1992).

[45] M. J. Martin, "Guidelines for Evaluators." Appendix E, page 73 (October 2019). To be published as an Oak Ridge National Laboratory report.

[46] S. Singh, S. Kumar, and B. Singh, "$ALPHAD_R$ad$D$ code : A program to calculate radius parameter(r_0) and hindrance factors of even-even, odd-A and odd-odd alpha emitters." available through `www − nds.iaea.org/public/ensdf_pgm/` (2018).

VI. EXPLANATION AND POLICIES OF TABLE II

Alpha Decay: The parent and daughter nuclides involved in a given alpha decay are listed in the first column of the table. Nuclei are listed with increasing atomic number; various isotopes are grouped together and placed with increasing mass number within the same group.

Q_α: Energy available for alpha decay in units of keV, adopted from M. Wang *et al.* [Chinese Physics C 41, 030003 (2017)] and in some cases where Q_α values, are derived from recent precise measurements of E_α, are indicated with appropriate comments.

$\%\alpha$: Alpha-decay branching from the ground state of the parent adopted from the ENSDF database supplemented by data from literature available up to June 2020. The decay branchings listed as approximate values in the literature are taken as exact values with appropriate overlap of uncertainties.

$T_{1/2}$: Half-life of parent nuclide from the ENSDF database, supplemented by data from recent literature available up to June 2020. For cases where $T_{1/2}$ values are re-evaluated, appropriate comments are given. The most current value(s), from the same lab and the same experimental group using the same method, is adopted, when reported by authors in different papers over time.

$I\alpha$: Alpha intensities per 100 decays of the parent nuclei. These are adopted from the ENSDF database or from more recent literature, with listing of source reference(s), when required. Whenever alpha intensities appeared with $\approx$, $<$, $>$, $\leq$ or $\geq$ signs, the uncertainties in these cases are assigned as:

(a) When only one alpha branch is seen or when $I\alpha$ is $\approx$ 100, then $I\alpha$ is assumed as 100 for deduction of radius parameter.

(b) For approximate values, we assumed 25% uncertainty e.g., for ^{196}Po alpha decay, for $I\alpha_1 = 99.978(6)$ and $I\alpha_2 = 0.022$, 25% uncertainty assumed for the latter.

(c) For the nuclides having $I\alpha <$ a certain value, we assumed a value overlapping 0 and the limit e.g., for $I\alpha < 1$ for ^{174}Pt alpha decay, $I\alpha = 0.5(5)$ was used.

r_0: Radius parameter for daughter nuclides extracted from alpha decay with the most current values of Q_α, $\%\alpha$, $T_{1/2}$ and $I\alpha$.

For cases with large (>30% or so) uncertainties either in half-lives or alpha branches, we executed ALPHAD for three values of input quantities, i.e., mean value, mean value + upper limit and mean value - lower limit. In cases where uncertainties are large in both the half-life as well as $\%\alpha$ branch, we obtained the mean value, then ran two cases, one with the maximum $\%\alpha$ branch (value + uncertainty) and the minimum half-life (value - uncertainty); the other with the minimum $\%\alpha$ branch (value - uncertainty) and the maximum half-life (value + uncertainty). The final value of r_0 in such procedures generally results in asymmetric uncertainties, where we adopt the final uncertainty in r_0 as an arithmetic average of the upper and lower uncertainties, since the ALPHAD and ALPHAD-RadD codes can handle only symmetric uncertainty in the r_0 parameter.

Rounding of uncertainties: In the averaging procedure, final uncertainty is not lower than the lowest experimental uncertainty in a dataset that is being averaged.

References: References are listed in terms of NSR keynumbers, and extracted from the NSR database.

Abbreviations

ENSDF: Evaluated Nuclear Structure Data File: www.nndc.bnl.gov/ensdf/

XUNDL: eXperimental Unevaluated Nuclear Data List: www.nndc.bnl.gov/xundl/

UWA: Unweighted Average

WA: Weighted Average

NRM: Weighted Average by Normalized Residuals Method [M.F James *et al.* Nucl. Instrum. Methods A 313, 277 (1992).]

TABLE II: Table of evaluated input quantities, and deduced r_0 parameters for daughter nuclides.

Alpha Decay	Input Parameters	r_0 (fm)
^{106}Te→^{102}Sn	Q_α = 4290(9). $\%\alpha$ = 100, $I\alpha$ = 100 (2009DE21). $T_{1/2}$ = 73 μs (+20-10). $T_{1/2}$: WA of 70 μs (+20-15) (2016CA33), 80 μs (+25-15) (2005JA03), 60 μs (+40-20) (1994PA11) and 60 μs (+30-10) (1981SC17).	1.684(49)
^{108}Te→^{104}Sn	Q_α = 3420(8). $\%\alpha$ = 51(6). $T_{1/2}$ = 2.1 s (1), $I\alpha$ = 100 (2007BL18). $\%\alpha$: WA of 49(4) (1994PA11) and 68(12) (1978RO19).	1.660(13)
^{108}Xe→^{104}Te	Q_α = 4600(200). $\%\alpha$ = 100, $T_{1/2}$ = 0.06 ms (+11-2) (2018AU04). $I\alpha$ = 100. Q_α : From 2018AU04, based on E_α = 4400 keV (200).	1.65(19)
^{110}Xe→ ^{106}Te	Q_α = 3872(9). $\%\alpha$ = 64(35), $T_{1/2}$ = 93 ms (3) (2012GU09). $I\alpha$ = 100 (2008DE09). $T_{1/2}$: 95 ms (+25-20) (2016CA33), 105 ms (+35-25)(2005JA03) and 160 ms (+290-60) (2002MA19) are imprecise, thus not considered here.	1.655(47)
^{112}Xe→ ^{108}Te	Q_α = 3330(6), $\%\alpha$ = 1.2(8), $T_{1/2}$ = 2.7 s (8) (2015LA02). $I\alpha$ = 100 (2000BL21).	1.671(75)
^{114}Ba→^{110}Xe	Q_α = 3592(19). $T_{1/2}$ = 410 ms (+190-110). $\%\alpha$ = 0.9(3), $I\alpha$ = 100 (2012GU09). $T_{1/2}$: WA of 380 ms (+190–110) (2016CA33) and 430(+300–150) ms (1997JA12).	1.700(47)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
^{144}Nd→ ^{140}Ce	Q_α = 1903.2(16). %α = 100, Iα = 100 (2018NI16). $T_{1/2}$ = 2.40x10^{15} *y* (30). $T_{1/2}$: WA of 2.65 *y* x10^{15} (37) (1987AL28), 2.4 *y* x10^{15} (3) (1961MA05) and 2.1 *y* x10^{15} (4) (1965IS01).	1.5986(81)
^{146}Sm→^{142}Nd	Q_α = 2528.8(28). %α = 100, $T_{1/2}$ = 6.8x10^{7} *y* (7) (2016KH07). Iα = 100 (2011JO05).	1.5930(74)
^{148}Sm→^{144}Nd	Q_α = 1986.8(4). $T_{1/2}$ = 6.4x10^{15} *y* (+12-13) (2016CA43). %α = 100 (2014NI05). Iα = 100 (2001SO16).	1.586(12)
^{148}Gd→^{144}Sm	Q_α = 3271.29(3). %α = 100, Iα = 100 (2014NI05). $T_{1/2}$ = 74.6 *y* (30) (1981PR06). $T_{1/2}$: In 2014NI05, $T_{1/2}$ is WA of 74.6 *y* (30) (1981PR06) and 70.9 *y* (10) (2003FU10); latter is a preliminary result, thus not considered here.	1.5695(23)
^{150}Gd→^{146}Sm	Q_α = 2807(6). %α = 100, $T_{1/2}$ = 1.79x10^{6} *y* (8), Iα = 100 (2016KH07).	1.5748(86)
^{150}Dy→^{146}Gd	Q_α = 4351.3(15). %α = 33.6(18), Iα = 100 (2016KH07). $T_{1/2}$ = 7.175 *min* (25). $T_{1/2}$: WA of 7.17 *min* (5) (1973BI06) and 7.3 *min* (1) (1982BO04).	1.5616(12)
^{152}Gd→^{148}Sm	Q_α = 2204.4(10). %α = 100, $T_{1/2}$ = 1.08x10^{14} *y* (8), Iα = 100 (2014NI05).	1.5741(45)
^{152}Dy→^{148}Gd	Q_α = 3727(4). %α = 0.100(7), $T_{1/2}$ = 2.38 *h* (2), Iα = 100 (2014NI05).	1.5796(54)
^{152}Er→ ^{148}Dy	Q_α = 4934.3(16). %α = 91(4), $T_{1/2}$ = 10.3 *s* (1), Iα = 100 (2014NI05).	1.5667(27)
^{154}Dy→^{150}Gd	Q_α = 2945(5). %α = 100, $T_{1/2}$ = 3.0x10^{6} *y* (15), Iα = 100 (2013BA31).	1.541(36)
^{154}Er→ ^{150}Dy	Q_α = 4279.7(26). %α = 0.47(13), $T_{1/2}$ = 3.73 *min* (9), Iα = 100 (2013BA31).	1.550(16)
^{154}Yb→ ^{150}Er	Q_α = 5474.3(17). %α = 92.6(12), $T_{1/2}$ = 0.409 *s* (2), Iα = 100 (2013BA31).	1.5574(12)
^{156}Er→^{152}Dy	Q_α = 3481(25). %α = 5.0x10^{-6}(2) (1995KAZS), $T_{1/2}$ = 19.5 *min* (10), Iα = 100 (2013MA77). %α : 5.0x10^{-6}(2) (1995KAZS), 1.2x10^{-5}(3) (1996BYZY), 5x10^{-6}(2) (1992KAZP), 1.0x10^{-4} (2002KAZR) and corresponding radius parameter comes out as 1.541 *fm* (26), 1.588 *fm* (30), 1.541 *fm* (26) and 1.704 *fm* (27), respectively. From systematics of radius parameter values in adjacent nuclides (r_0 = 1.5661 *fm* (28) and 1.550 *fm* (16) for ^{148}Dy and ^{150}Dy), the most likely value for ^{152}Dy is the one resulting from %α = 5.0x10^{-6}(2) (1995KAZS).	1.541(26)
^{156}Yb→ ^{152}Er	Q_α = 4810(4). %α = 10(2), $T_{1/2}$ = 26.1 *s* (7), Iα = 100 (2013MA77).	1.596(12)
^{156}Hf→ ^{152}Yb	Q_α = 6029(4). %α = 100, $T_{1/2}$ = 23 *ms* (1), Iα = 100 (2013MA77).	1.5532(31)
^{158}Yb→ ^{154}Er	Q_α = 4170(7). %α = 0.0021(12), $T_{1/2}$ = 1.49 *min* (13) (2017NI05). Iα = 100 (2009RE14).	1.529(41)
^{158}Hf→ ^{154}Yb	Q_α = 5404.8(27). %α = 44.3(19), $T_{1/2}$ = 2.85 *s* (7) (2017NI05). Iα = 100 (2009RE14).	1.5614(31)
^{158}W→ ^{154}Hf	Q_α = 6613(3). %α = 100, $T_{1/2}$ = 1.25 *ms* (21) (2017NI05). Iα = 100 (2009RE14).	1.557(10)
^{160}Hf→ ^{156}Yb	Q_α = 4901.9(26). %α = 0.7(2), $T_{1/2}$ = 13.6 *s* (2), Iα = 100 (2012RE18).	1.549(16)
^{160}W→ ^{156}Hf	Q_α = 6066(5). %α = 87(8), $T_{1/2}$ = 91 *ms* (5), Iα = 100 (2012RE18).	1.5562(63)
^{162}Hf→ ^{158}Yb	Q_α = 4416(5). %α = 0.008(1), $T_{1/2}$ = 39.4 *s* (9), Iα_1 = 99.77(23), Iα_2 = 0.23(23) (2017NI05).	1.5842(77)
^{162}W→ ^{158}Hf	Q_α = 5678.3(24). %α = 45(2). $T_{1/2}$ = 1.19 *s* (12), Iα = 100 (2017NI05). %α : WA of 46(4) (1981HO10), 49(4) (1989WO02) and 44(2) (1996PA01).	1.5710(61)
^{162}Os→ ^{158}W	Q_α = 6767(3). %α = 100, $T_{1/2}$ = 2.1 *ms* (1), Iα = 100 (2017NI05).	1.5597(29)
^{164}W→ ^{160}Hf	Q_α = 5278.3(20). %α = 3.8(12), $T_{1/2}$ = 6.3 *s* (2) (2018SI01). Iα = 99.5(5) (2005RE18).	1.565(19)
^{164}Os→ ^{160}W	Q_α = 6479(5). %α = 96(+4–5), $T_{1/2}$ = 21 *ms* (1) (2018SI01). Iα = 95(5) (2005RE18).	1.5477(44)
^{166}W→ ^{162}Hf	Q_α = 4856(4). %α = 0.035(12), $T_{1/2}$ = 19.2 *s* (6) (2008BA14). Iα = 100 (2007RE16).	1.516(21)
^{166}Os→ ^{162}W	Q_α = 6143(3). %α = 83(4). $T_{1/2}$ = 213 *ms* (5) (2008BA14). Iα = 100 (ENSDF updates Feb.-2016). %α : WA of 72(13) (1981HO10) and 84(4) (2008BI15).	1.5663(32)
^{166}Pt→ ^{162}Os	Q_α = 7286(15). $T_{1/2}$ = 0.280 *ms* (+100-60). %α = 100 (2008BA14). Iα = 100 (2007RE16). $T_{1/2}$: WA of 0.260 *ms* (+100-60) (2019HI06) and 0.3 *ms* (1) (1996BI07).	1.554(17)
^{168}W→ ^{164}Hf	Q_α = 4500(11). %α = 0.0032(10), $T_{1/2}$ = 50.9 *s* (19), Iα = 97.7(23) (2018SI01).	1.580(35)
^{168}Os→ ^{164}W	Q_α = 5815.6(27). %α = 43(4), $T_{1/2}$ = 2.1 *s* (1), Iα = 97(3) (2018SI01).	1.5642(59)
^{168}Pt→ ^{164}Os	Q_α = 6990(3). %α = 99.3(7), $T_{1/2}$ = 2.02 *ms* (10), Iα = 100 (2018SI01).	1.5568(29)
^{170}Os→ ^{166}W	Q_α = 5536.9(27). %α = 9.5(10), $T_{1/2}$ = 7.37 *s* (18) (2018BA41). Iα = 97(3) (2008BA14).	1.5611(60)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
^{170}Pt→ ^{166}Os	Q_α = 6707(3). %α = 98(2) (2018BA41). $T_{1/2}$ = 13.93 *ms* (24), Iα = 100 (2008BA14).	1.5636(19)
^{170}Hg→ ^{166}Pt	Q_α = 7773(30). %α = 100, $T_{1/2}$ = 0.08 *ms* (+40-4) (2019HI06). Iα = 100. Q_α : From 2019HI06, based on E_α = 7590 keV (30).	1.526(64)
^{172}Os→ ^{168}W	Q_α = 5224(7). %α = 1.4(3) (2004GOZZ). $T_{1/2}$ = 19.2 *s* (9) (1995HI02). Iα = 95(5) (2010BA27).	1.583 (13)
^{172}Pt→ ^{168}Os	Q_α = 6463(4). %α = 94(6) (2004GOZZ). $T_{1/2}$ = 97.5 *ms* (13). Iα = 98(2) (2010BA27). $T_{1/2}$: WA of 97.6 *ms* (13) (2003DA06), 104 *ms* (7) (2002RO17) and 96 *ms* (3) (1996PA01).	1.5578(40)
^{172}Hg→^{168}Pt	Q_α = 7524(6). $T_{1/2}$ = 231 μs (9) (2009SA27). %α = 100, Iα = 99.3(7) (2010BA27).	1.5567(30)
^{174}Hf→ ^{170}Yb	Q_α = 2449.5(23) (2017Wa10). $T_{1/2}$ = 7.0x10^{16} *y* (12) (2020CA15). The value of E_α is not given in 2020CA15. %α = 100, Iα = 100 (2018BA41). Q_α = 2559(31) (from E_α=2500(30) *keV*) and $T_{1/2}$ = 2.0x10^{15} *y* (4) from 1961MA05 gives radius parameter of 1.552 (51) *fm*, but these data are not used here as the half-life is about 35 times shorter than in 2020CA15, and the deduced Q_α is not in good agreement with the value recommended in 2017WA10.	1.4833(91)
^{174}Os→ ^{170}W	Q_α = 4871(10). $T_{1/2}$ = 44 *s* (5). %α = 0.020(10), Iα = 100 (2018BA41). $T_{1/2}$: WA of 45 *s* (5) (1973BE67) and 42 *s* (6) (1972BE89).	1.540(34)
^{174}Pt→ ^{170}Os	Q_α = 6183(3). $T_{1/2}$ = 0.868 *s* (9). %α = 75(4), Iα_1 = 99.5(5), Iα_2 < 1 (2018BA41). $T_{1/2}$: WA of 0.7 *s* (2) (1966SI08), 0.80 *s* (5) (1981DE22), 0.90 *s* (1) (1982EN03), 0.890 *s* (20) (1996PA01), 0.857 *s* (5) (2004GOZZ) and 0.93 *s* (3) (2014PE02).	1.5551(32)
^{174}Hg→^{170}Pt	Q_α = 7233(6). $T_{1/2}$ = 1.9 *ms* (+4-3), %α = 99.7(3), Iα = 100 (2018BA41).	1.548(12)
^{176}Pt→ ^{172}Os	Q_α = 5885.1(21). %α = 40(3). $T_{1/2}$ = 6.33 *s* (15) (1973GA08). Iα_1 = 99.74(13), Iα_2 = 0.26(13) (1979HA10). %α : WA of 42(4) (1996PA01), 38(3) (1979HA10) and 42(4) (1970HA18).	1.5597(42)
^{176}Hg→ ^{172}Pt	Q_α = 6897(6). %α = 91(9). $T_{1/2}$ = 20.8 *ms* (20). Iα = 100 (ENSDF updates private communication 2018). $T_{1/2}$: Weighted average of 20 *ms* (3) (2009AN20), 22 *ms* (1) (2004GOZZ; uncertainty is taken as doubled in averaging procedure so that it is not weighted by more than 50%), 20 *ms* (2) (2002RO17), 21 *ms* (3) (2001JU09, 1998MU25), 20 *ms* (3) (1999TO11) and 21 *ms* (4) (1999PO09). The value 18 *ms* (10) (1996PA01) is not considered because of its comparatively large uncertainty. %α : 1999PO09 give %α = 94(12), which has been adjusted here to 91(9) as the maximum alpha branch cannot exceed 100%.	1.5457(75)
^{178}Pt→ ^{174}Os	Q_α = 5573.0(22). %α = 7.7(3) (2009AC01). $T_{1/2}$ = 20.8 *s* (8). Iα_1 = 96.7(4), Iα_2 = 3.3(4) (2019HAAA). $T_{1/2}$: WA of 20 *s* (1) (2000KO16), 22 *s* (2) (1993ME13), 21 *s* (1) (1982BO04), 19 *s* (2) (1970HA18), 21.2 *s* (8) (1968DE01) and 21.3 *s* (15) (1966SI08).	1.5708(31)
^{178}Hg→ ^{174}Pt	Q_α = 6577.3(30). %α = 89(4) (2012VE04). $T_{1/2}$ = 266.6 *ms* (23). Iα = 98(2) (1999BR24). $T_{1/2}$: WA of 283 *ms* (23) (2004GOZZ), 269 *ms* (3) (2002RO17), 262 *ms* (4) (200KO01), 287 *ms* (23) (1996PA01), 250 *ms* (25) (1991SE01), 260 *ms* (30) (1979HA10) and 260 *ms* (30) (1976HOZD).	1.5409(29)
^{178}Pb→ ^{174}Hg	Q_α = 7790(14). %α = 100 (2009AC01). $T_{1/2}$ = 0.21 *ms* (+21-8), Iα = 100 (2016BA60).	1.545(35)
^{180}Pt→ ^{176}Os	Q_α = 5277(5). $T_{1/2}$ = 56 *s* (3) (2015MC03). %α = 0.52(5) (2020CU02). Iα_1 = 97.8(2), Iα_2 = 2.2(2) (2019CUBB). Q_α : From 2020CU02, based on E_α = 5160 (5) *keV* (30)	1.5468(62)
^{180}Hg→ ^{176}Pt	Q_α = 6258.5(24). %α = 48(2), $T_{1/2}$ = 2.59 *s* (1) (2015MC03). Iα_1 = 99.87(3), Iα_2 = 5.4x10^{-2}(9), Iα_3 = 7.9x10^{-2} (2006BA16).	1.5324(24)
^{180}Pb→ ^{176}Hg	Q_α = 7419 (5). %α = 100, $T_{1/2}$ = 4.1 *ms* (3) (2015MC03). Iα > 96 (2006BA16). Iα : 98(2) used to deduce radius parameter.	1.5184(43)
^{182}Pt→ ^{178}Os	Q_α = 4951(5). %α = 0.038(2), $T_{1/2}$ = 2.67 *min* (12) (2015SI18). Iα = 91(9) (2009AC01).	1.5539(68)
^{182}Hg→ ^{178}Pt	Q_α = 5996(5). %α = 13.8(9), $T_{1/2}$ = 10.83 *s* (6) (2015SI18). Iα_1 = 99.2(1), Iα_2 = 0.57(10), Iα_3 = 0.24 (6) (2009AC01). Iα_1 : Uncertainty deduced by authors using values of Iα_2 and Iα_3.	1.5176(41)
^{182}Pb→ ^{178}Hg	Q_α = 7066(6). %α = 99(1) (2015SI18). $T_{1/2}$ = 59 *ms* (6). Iα = 94(6) (1998AK04). $T_{1/2}$: WA of 55 *ms* (5) (1999TO11) and 68 *ms* (7) (2000JE09).	1.5093(64)
^{184}Pt→ ^{180}Os	Q_α = 4599(8). %α = 0.0017(7), $T_{1/2}$ = 17.3 *min* (2), Iα = 94(6) (2015MC03).	1.542(27)
^{184}Hg→ ^{180}Pt	Q_α = 5662(4). %α = 1.26(20), $T_{1/2}$ = 30.87 *s* (26), Iα_1 = 99.44(10), Iα_2 = 0.40(8), Iα_3 = 0.16(3) (2015MC03).	1.5120(81)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
$^{184}Pb \rightarrow {}^{180}Hg$	Q_α = 6774(3). %α = 80(15), $T_{1/2}$ = 490 *ms* (25) (2015MC03). Iα = 91(9) (1998AK04).	1.504(11)
$^{186}Os \rightarrow {}^{182}W$	Q_α = 2821.2(9). %α = 100, $T_{1/2}$ = 2.0x10^{15} *y* (11), Iα = 97.5(25) (2015SI18).	1.486(29)
$^{186}Pt \rightarrow {}^{182}Os$	Q_α = 4320(18). $T_{1/2}$ = 2.08 *h* (5). %α = 0.00018(10), Iα = 94(6) (2015SI18). $T_{1/2}$: WA of 2.10 *h* (5) (1991BE25), 2.0 *h* (1) (1972FI12) and 2.0 *h* (2)(1963GR08). %α : ≈ 0.00014% was deduced by 1963GR08 by assuming that neighboring mass nuclei were produced in equal quantities and their reported branching is estimated to be correct within a factor of 2. Therefore, the probable branching i.e. %α = 0.00014, 0.00028 and 0.00007 gives radius parameters as r_0 = 1.518 *fm*, r_0 = 1.574 *fm*, r_0 = 1.485 *fm*, respectively (2015SI18). The adopted value of %α is 0.00018(10).	1.536(30)
$^{186}Hg \rightarrow {}^{182}Pt$	Q_α = 5204(10). %α = 0.016(5), $T_{1/2}$ = 1.38 *min* (6), Iα = 94(6) (2015SI18).	1.500(17)
$^{186}Pb \rightarrow {}^{182}Hg$	Q_α = 6470(6). %α = 40(8), $T_{1/2}$ = 4.82 *s* (3), Iα_1 = 99.6(2), Iα_2 = 0.20(5), Iα_3 < 0.16 (2015SI18).	1.486(10)
$^{186}Po \rightarrow {}^{182}Pb$	Q_α = 8501(14). %α ≈ 100 (2015SI18). $T_{1/2}$ = 28 *μs* (+16–6) (2013AN13). Iα = 100.	1.488(19)
$^{188}Pt \rightarrow {}^{184}Os$	Q_α = 4007(5). $T_{1/2}$ = 10.2 *d* (3). %α = 2.6x10^{-5}(3), Iα = 95(5) (2010BA05). $T_{1/2}$: WA of 10.5 *d* (10) (1963KA17), 10.2 *d* (3) (1963GR08), 10.0 *d* (3) (1955SM42) and 10.3 *d* (4) (1954NA25).	1.4648(74)
$^{188}Hg \rightarrow {}^{184}Pt$	Q_α = 4707(16). %α = 3.7x10^{-5}(8), $T_{1/2}$ = 3.25 *min* (15) (2018KO15). Iα = 96(4) (2010BA05).	1.480(15)
$^{188}Pb \rightarrow {}^{184}Hg$	Q_α = 6109 (3). %α = 8.5 (5), $T_{1/2}$ = 25.5 *s* (1) (2018KO15). Iα_1 = 99(1), Iα_2 = 0.095, Iα_3 ≈ 1 (2010BA05).	1.4885(32)
$^{188}Po \rightarrow {}^{184}Pb$	Q_α = 8082(15). $T_{1/2}$ = 275 *μs* (30) (2003VA16). %α ≈ 100, Iα_1 = 80(4), Iα_2 = 20(4) (2010BA05).	1.4868(76)
$^{190}Pt \rightarrow {}^{186}Os$	Q_α = 3268.6(6). $T_{1/2}$ = 4.97x10^{11} *y* (16) (2017BR04). %α = 100, Iα = 100 (2003BA44).	1.4651(16)
$^{190}Pb \rightarrow {}^{186}Hg$	Q_α = 5698(5). %α = 0.40(4), $T_{1/2}$= 71 *s* (1), Iα_1 = 99.90(2), Iα_2 = 0.084(15), Iα_3 = 0.014(6) (2003BA44). Iα_1 : Uncertainty deduced by authors using values of Iα_2 and Iα_3.	1.4923(55)
$^{190}Po \rightarrow {}^{186}Pb$	Q_α = 7693(7). $T_{1/2}$ = 2.46 *ms* (5). %α = 100, Iα_1 = 96.4(4), Iα_2 = 3.3(4), Iα_3 = 0.3(1) (2003BA44). $T_{1/2}$: WA of 2.5 *ms* (1) (2003VA05), 2.45 *ms* (5) (2000AN14, 2001AN07) and 2.53 *ms* (33) (1999AN22).	1.5114(26)
$^{192}Pb \rightarrow {}^{188}Hg$	Q_α = 5221(5). %α = 0.0059(10). $T_{1/2}$ = 3.5 *min* (1) (2012BA36). Iα = 100 (2018KO15). %α : WA of 0.0057(10) (1979TO06) and 0.0061(11) (1992WA14).	1.5005(86)
$^{192}Po \rightarrow {}^{188}Pb$	Q_α = 7320(3). %α = 99.5(5), $T_{1/2}$ = 32.2 *ms* (3) (2012BA36). Iα_1 = 98.57(15), Iα_2 = 1.43(15) (2018KO15).	1.5137(13)
$^{194}Pb \rightarrow {}^{190}Hg$	Q_α = 4738(17). %α = 7.3x10^{-6}(29), $T_{1/2}$ = 10.7 *min* (6) (2006SI17). Iα = 99.9(1) (2003SI05).	1.437(24)
$^{194}Po \rightarrow {}^{190}Pb$	Q_α = 6987(3). %α = 93(7) (1993WA04). $T_{1/2}$ = 0.392 *s* (4) (2006SI17). Iα_1 = 99.71(6), Iα_2 = 0.24(3). Iα_3 = 0.05(5) (2003SI05).	1.5113(39)
$^{194}Rn \rightarrow {}^{190}Po$	Q_α = 7862(10). $T_{1/2}$ = 0.78 *ms* (16) (2006AN36). %α = 100, Iα = 100 (ENSDF updates Jan.-2014).	1.590(11)
$^{196}Po \rightarrow {}^{192}Pb$	Q_α = 6658.1(24). %α = 94(5), $T_{1/2}$ = 5.60 *s* (8), Iα_1 = 99.978, Iα_2 = 0.022, Iα_3 < 0.0065 (2012BA36).	1.5126(28)
$^{196}Rn \rightarrow {}^{192}Po$	Q_α = 7617(9). $T_{1/2}$ = 4.4 *ms* (+13-9) (2001KE06). %α = 99.80(20), Iα = 100 (2012BA36).	1.585(15)
$^{198}Po \rightarrow {}^{194}Pb$	Q_α = 6309.7(14). %α = 57(2), $T_{1/2}$ = 1.760 *min* (24) (2016HU04). Iα_1 = 99.9987(3), Iα_2 = 0.00133(24) (2006SI17).	1.4962(19)
$^{198}Rn \rightarrow {}^{194}Po$	Q_α = 7349(4). $T_{1/2}$ = 65 *ms* (3) (2016HU04). %α = 99.4(6), Iα_1 = 99.93(2), Iα_2 = 0.07(2) (2006SI17).	1.5455(27)
$^{200}Po \rightarrow {}^{196}Pb$	Q_α = 5981.6(18). %α = 11.1(3) (2007KO42). $T_{1/2}$ = 11.5 *min* (1), Iα = 100 (2007HU13).	1.4803(16)
$^{200}Rn \rightarrow {}^{196}Po$	Q_α = 7043.4(21). %α = 91(9), $T_{1/2}$ = 1.03 *s* (+20-11) (2007KO42). Iα_1 = 99.986(3), Iα_2 = 0.006(2), Iα_3 = 0.0081(7) (1998AK04).	1.5205(93)
$^{202}Po \rightarrow {}^{198}Pb$	Q_α = 5701.0(17). %α = 1.92(7), $T_{1/2}$ = 44.6 *min* (4), Iα = 100 (2016HU04).	1.4720(20)
$^{202}Rn \rightarrow {}^{198}Po$	Q_α = 6773.8(18). %α = 78(8), $T_{1/2}$ = 9.7 *s* (1), Iα_1 = 99.9982(6), Iα_2 < 0.018, Iα_3 = 0.0018(6) (2016HU04).	1.5106(49)
$^{202}Ra \rightarrow {}^{198}Rn$	Q_α = 7880(7). $T_{1/2}$ = 3.8 *ms* (+13-8) (2014KA23). %α = 100, Iα = 100 (2016HU04).	1.573(15)
$^{204}Po \rightarrow {}^{200}Pb$	Q_α = 5484.9(14). %α = 0.67(3), $T_{1/2}$ = 3.519 *h* (12) (2010CH02). Iα = 100 (2007KO42).	1.4625(22)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
^{204}Rn→ ^{200}Po	Q_α = 6546.7(18). %α = 72.4(9), $T_{1/2}$ = 74.5 *s* (14) (2010CH02). Iα = 100 (2007KO42).	1.5026(13)
^{204}Ra→ ^{200}Rn	Q_α = 7637(7). %α = 100 (2010CH02). $T_{1/2}$ = 54 *ms* (+19-11) (2005UU02). Iα = 100 (2007KO42).	1.525(14)
^{206}Po→ ^{202}Pb	Q_α = 5327.0(13). %α = 5.45(5), $T_{1/2}$ = 8.8 *d* (1) (2008KO21). Iα = 100 (2008ZH05).	1.4547(10)
^{206}Rn→ ^{202}Po	Q_α = 6383.7(16). %α = 62(3), $T_{1/2}$ = 5.67 *min* (17) (2008KO21). Iα = 100 (2008ZH05).	1.4917(27)
^{206}Ra→ ^{202}Rn	Q_α = 7415(4). %α = 99.3(7). $T_{1/2}$ = 0.24 *s* (2) (2008KO21). Iα = 100 (2008ZH05) %α : Based on theoretical $T_{1/2}(\alpha)$ = 0.20 *s* and $T_{1/2}(\beta^+)$ = 11.93 (s), which gives %ϵ+%$\beta^+\approx$1.5 (2019MO01) or %α = 99.3(7).	1.5287(42)
^{208}Po→ ^{204}Pb	Q_α = 5215.4(13). %α = 99.9960(4) (2007MA45). $T_{1/2}$ = 2.898 *y* (2), Iα_1 = 99.99976(7), Iα_2 = 0.00024(7) (2010CH02).	1.42967(74)
^{208}Rn→ ^{204}Po	Q_α = 6260.7(17). %α = 62(7), $T_{1/2}$ = 24.35 *min* (14), Iα_1 = 99.953(4), Iα_2 = 0.047(4) (2010CH02).	1.4755(52)
^{208}Ra→ ^{204}Rn	Q_α = 7273(5). $T_{1/2}$ = 1.110 *s* (45) (2010HE25). %α = 95(5), Iα = 100 (2010CH02). $T_{1/2}$: 1.1 *s* (+21−5) and 0.41 *s* (+75−16) (2015MA37) are not considered due to comparatively large uncertainties.	1.5029(36)
^{210}Pb→ ^{206}Hg	Q_α = 3792(20). %α = 1.9x10^{-6}(4), $T_{1/2}$ = 22.20 *y* (22) (2014BA41). Iα = 100 (2008KO21).	1.449(21)
^{210}Po→ ^{206}Pb	Q_α = 5407.53(7). %α = 100, $T_{1/2}$ = 138.376 *d* (14) (2014BA41). Iα_1 = 99.99885(9), Iα_2 = 0.00115(9) (2018SH12). $T_{1/2}$: Uncertainty of 0.002 *d* quoted in 2014BA41 evaluation increased to 0.014 *d*, as per guidelines for half-life evaluations for ENSDF, accepted at the 2015 NSDD meeting. $T_{1/2}$ = 138.43 *d* (21) (2015ZH41) and 140.6 *d* (15) (2014PO01) are imprecise, thus not considered here. Iα_1 : Uncertainty is deduced by authors using values of Iα_2.	1.408790(38)
^{210}Rn→ ^{206}Po	Q_α = 6159.0(22). %α = 96(1), $T_{1/2}$ = 2.4 *h* (1) (2014BA41). Iα_1 = 99.9944(3), Iα_2 = 0.0056(3) (2008KO21).	1.4568(22)
^{210}Ra→ ^{206}Rn	Q_α = 7151(3). %α = 95(5). $T_{1/2}$ = 3.9 *s* (1). Iα_1= 99.97, Iα_2= 0.03 (2008KO21). $T_{1/2}$: WA of 3.8 *s* (2) (1967VA22), 3.6 *s* (2) (1968LO15) and 4.0 *s* (1) (2008HA12). $T_{1/2}$: 6.6 *ms* (+317−30) and 1.4 *s* (+67−6) (2015MA37) are not considered due to comparatively large uncertainties. %α : Based on theoretical $T_{1/2}(\alpha)$ = 3.7 *s* and $T_{1/2}(\beta)$ = 68.9 (s), which gives %β = 5% (2019MO01) and allowing 100% uncertainty gives %β < 10% or %α = 95(5).	1.4861(29)
^{210}Th→^{206}Ra	Q_α = 8069(6). $T_{1/2}$ = 16.0 *ms* (36) (2010HE25). %$\alpha\approx$ 100, Iα = 100 (2008KO21).	1.507(11)
^{212}Po→ ^{208}Pb	Q_α = 8954.20(11). $T_{1/2}$ = 0.2956 μs (10). %α = 100, Iα = 100 (2007MA45). $T_{1/2}$: WA of 0.2939 μs (12) (2017AP03), 0.309 μs (11) (1981BO29), 0.296 μs (2) (1975SA06), 0.304 μs (8) (1972MC29), 0.305 μs (5) (1963AS02), 0.304 μs (4) (1949BU09), 0.2947 μs (10) (2013BE31) and 0.299 μs (2) (2010AS03).	1.52177(18)
^{212}Rn→ ^{208}Po	Q_α = 6385.1(26). %α = 100, $T_{1/2}$ = 23.9 *min* (12), Iα_1 = 99.950(5), Iα_2 = 0.050(5) (2007MA45).	1.4343(25)
^{212}Ra→ ^{208}Rn	Q_α = 7031.7(17). %α = 94(6). $T_{1/2}$ = 13.0 *s* (2), Iα_1 = 99.95, Iα_2 = 0.05 (2007MA45). $T_{1/2}$: 9.9 *s* (+46-24) (2014YA19) is not considered due to comparatively large uncertainty. %α : Based on theoretical $T_{1/2}(\alpha)$ = 2.9 *s* and $T_{1/2}(\beta)$ > 100 (s), which gives %β < 3% (2019MO01) but using experimental $T_{1/2}(\alpha)$ = 13.0 *s* gives %β < 12% or %α = 94(6).	1.4718(31)
^{212}Th→ ^{208}Ra	Q_α = 7958(5). $T_{1/2}$ = 31.7 *ms* (13)(ENSDF updates Dec.-2015). %α = 99.7(3), Iα = 98.8(12) (2007MA45). $T_{1/2}$: 22 *ms* (+22−7) and 28 *ms* (+51−11) (2015MA37) are not considered due to comparatively large uncertainties.	1.5058(26)
^{214}Po→ ^{210}Pb	Q_α = 7833.54(6). $T_{1/2}$ = 163.47 μs (4). %α =100, Iα_1 = 99.9895(6), Iα_2 = 0.0104(6), Iα_3 = 6x10^{-5}(2) (2014BA41). $T_{1/2}$: WA of 163.46 μs (4)(2016AL28), 163.58 μs (31)(2013BE31) and 164.2 μs (6)(2012SU11). The values 169.5 μs (94) (2015AL27) and 163.8 μs (30) (2013BE20) are imprecise, thus not considered here.	1.539616(24)
^{214}Rn→ ^{210}Po	Q_α = 9208(9). $T_{1/2}$ = 259 *ns* (3) (2019PA45). %α = 100, Iα = 99.95(5) (2014BA41). $T_{1/2}$: 0.27 *s* (2) (1970VA13) is not considered due to comparatively large uncertainty.	1.5340(25)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
^{214}Ra→ ^{210}Rn	Q_α = 7272.6(26). %α = 99.941(4) (2009WU02). $T_{1/2}$ = 2.44 *s* (4). $I\alpha_1$ = 99.84(3), $I\alpha_2$ = 0.16(3) (2014BA41). $T_{1/2}$: WA of 2.36 *s* (6) (2015KH09) and 2.46 *s* (3)(1973BE33).	1.4557(12)
^{214}Th→ ^{210}Ra	Q_α = 7827(5). %α = 99.90(10), $T_{1/2}$ = 87 *ms* (10) (2014BA41). $I\alpha$ = 99.5(5) (1998AK04). $T_{1/2}$: 68 *ms* (+93−25) and 67 *ms* (+322−31) (2015MA37) are not considered due to comparatively large uncertainties.	1.4986(56)
^{216}Po→ ^{212}Pb	Q_α = 6906.4(5). %α = 100, $T_{1/2}$ = 144.0 *ms* (6) (2017NA22). $I\alpha_1$ = 99.9981(3), $I\alpha_2$ = 0.0019(3) (2005BR03). $T_{1/2}$: 136 *ms* (6) (2018BA44), 175 *ms* (+13-11) (2012BE14), 144 *ms* (8) (2003DA24) and 145 *ms* (2) (1963DI05) are not considered due to comparatively large uncertainties.	1.54117(28)
^{216}Rn→ ^{212}Po	Q_α = 8197(6). %α = 100, $T_{1/2}$ = 45 μs (5) (2007WU02). $I\alpha$ = 99.6(4) (2005BR03).	1.5658(59)
^{216}Ra→ ^{212}Rn	Q_α = 9526(8). %α = 100 (2007WU02). $T_{1/2}$ = 172 *ns* (10). $I\alpha$ = 99.97(3) (2005BR03). $T_{1/2}$: WA of 161 *ns* (11) (2019PA45) and 182 *ns* (10)(1973NO09).	1.5433(36)
^{216}Th→ ^{212}Ra	Q_α = 8072(4). %α = 100, $T_{1/2}$ = 26.0 *ms* (2) (2007WU02). $I\alpha_1$ = 99.6(1), $I\alpha_2$ = 0.4(1) (2005KU31). $T_{1/2}$: 29 *ms* (+13-7) (2014YA19) is not considered due to comparatively large uncertainty.	1.4695(14)
^{216}U→ ^{212}Th	Q_α = 8531(26). $T_{1/2}$ = 4.7 *ms* (+47-16) (2015MA37). %α = 100, $I\alpha$ = 100 (ENSDF updates Dec.-2015). $T_{1/2}$: 3.8 *ms* (+88-32) (2015DE22) is not considered due to comparatively large uncertainty.	1.486(33)
^{218}Po→ ^{214}Pb	Q_α = 6114.75(9). $T_{1/2}$ = 3.098 *min* (12) (2006JA03). %α = 99.980(2), $I\alpha_1$ = 99.9989(11), $I\alpha_2$ = 0.0011 (ENSDF updates Feb.-2015).	1.53788(19)
^{218}Rn→ ^{214}Po	Q_α = 7262.5(19). $T_{1/2}$ = 33.75 *ms* (15) (2012SU11). %α = 100, $I\alpha_1$ = 99.87(1), $I\alpha_2$ = 0.127(10) (2009WU02).	1.56062(74)
^{218}Ra→ ^{214}Rn	Q_α = 8540(4). %α = 99.88(6) (2019PA45). $T_{1/2}$ = 25.91 μs (14). $I\alpha$ = 99.5 (5) (2009WU02). $T_{1/2}$: WA of 25.99 μs (10) (2019PA45), 25.2 μs (3) (2001Ku07), 26 μs (2) (1992WI14) and 25.6 μs (11) (1986TO02). Q_α : WA of Q_α = 8538 keV (4) based on E_α = 8810 keV (13) (2019PA45), Q_α = 8546 keV (6) based on E_α = 8385 keV (10) (1970VA13) and Q_α = 8392 keV (8) (1970TO07).	1.5655(13)
^{218}Th→ ^{214}Ra	Q_α = 9849(9). %α = 100 (2006JA03). $T_{1/2}$ = 122 *ns* (5). $I\alpha$ = 100 (2009WU02). $T_{1/2}$: NRM WA of 169 *ns* (+73-40) (2018BR13), 160 *ns* (40) (2015KH09), 96 *ns* (7) (1973NO09, 1973HI06), 122 *ns* (8) (1973HA32) and 125 *ns* (5) (1982CH29). The NRM method is preferred, as in 2019SI39 evaluation, because regular weighted average gives reduced χ^2 of 3.7 as compared to critical χ^2 = 2.4.	1.5487(30)
^{218}U→^{214}Th	Q_α = 8775(9). $T_{1/2}$ = 0.51 *ms* (+17-10) (2006JA03). %α = 100, $I\alpha$ = 100 (2009WU02). $T_{1/2}$: 1.15 *s* (+158−42)(2015MA37) is not considered due to comparatively large uncertainty.	1.512(14)
^{220}Rn→^{216}Po	Q_α = 6404.74(10). %α = 100, $T_{1/2}$ = 55.6 *s* (1) (2011BR05). $I\alpha_1$ = 99.886(17), $I\alpha_2$ = 0.114(17) (2007WU02). $T_{1/2}$: The values 58 *s* (4) (2018BA44) and 64 *s* (+19-12) (2012BE14) are imprecise, thus not considered here.	1.55548(10)
^{220}Ra→^{216}Rn	Q_α = 7592(6). %α = 100, $T_{1/2}$ = 18 *ms* (2) (2011BR05). $I\alpha_1$ = 99.0(4), $I\alpha_2$ = 1.0(4) (2007WU02). $I\alpha$: 3^{rd} alpha branch is also reported in 2007WU02, not considered here because of its highly tentative nature.	1.5539(57)
^{220}Th→^{216}Ra	Q_α = 8973(13). $T_{1/2}$ = 10.2 μs (4). %α = 100 (2011BR05). $I\alpha$ = 99.3(7) (2007WU02). $T_{1/2}$: WA of 10.4 μs (4) (2019PA45) and 9.7 μs (6) (1973HA32). Q_α : Based on E_α = 8810 keV (13) obtained from WA of E_α = 8818 keV (13) (2019PA45) and E_α = 8790 keV (30) (1973HA32).	1.6051(43)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
^{222}Rn→^{218}Po	Q_α = 5590.4(3). $T_{1/2}$ = 3.8222 *d* (9). %α = 100, $I\alpha_1$ = 99.92(1), $I\alpha_2$ = 0.078(1), $I\alpha_3$ ≈ 0.0005 (2006JA03). $T_{1/2}$: WA of 3.82146 *d* (85) (2015BE07, quoted uncertainty of 0.00017 *d* increased to 0.00085 *d*, to have a maximum relative weight of 50%); 3.8195 *d* (30) (2004SC04, reanalysis of 2004SC04 data by 2018PO01 gave 3.825 *d* (5)); 3.8224 *d* (18) (1995CO34); 3.82351 *d* (170) (1972BU33, quoted uncertainty of 0.00034 *d* increased to 0.00170 *d* as in 1990HO28 evaluation); 3.83 *d* (3) (1958SH69); 3.82290 *d* (170) (1956MA64, quoted uncertainty of 0.00027 *d* increased to 0.00170 *d* as in 1990HO28); 3.825 *d* (5) (1956RO31, quoted uncertainty of 0.004 *d* increased to 0.005 *d* as in 1990HO28); 3.825 *d* (6) (1955TO07,1951TO25, quoted uncertainty of 0.005 *d* increased to 0.006 *d* as in 1990HO28); 3.823 *d* (3) (1924CU01, quoted uncertainty of 0.002 *d* increased to 0.003 *d* as in 1990HO28) and 3.825 *d* (4) (1923BO01).	1.54863(17)
^{222}Ra→^{218}Rn	Q_α = 6678(4). $T_{1/2}$ = 33.6 *s* (4) (2012PO13). %α = 100, $I\alpha_1$ = 96.9(1), $I\alpha_2$ = 3.05(5), $I\alpha_3$ = 0.0041(1), $I\alpha_4$ = 0.0041(2), $I\alpha_5$ = 0.0042(1) (2006JA03).	1.5492 (18)
^{222}Th→^{218}Ra	Q_α = 8127(5). %α = 100 (2011SI24). $T_{1/2}$ = 1.964 *ms* (2), $I\alpha_1$ = 98.16(5), $I\alpha_2$ = 1.81(1), $I\alpha_3$ = 1.8x10^{-2}(3), $I\alpha_4$ = 1.4x10^{-2}(4) (2016PA28).	1.5571(17)
^{222}U→^{218}Th	Q_α = 9480(50). %α = 100, $T_{1/2}$ = 4.7 *μs* (7) (2015KH09). Iα = 100. Q_α : Based on E_α = 9.31 MeV (5) (2015KH09).	1.529(15)
^{224}Ra→^{220}Rn	Q_α = 5788.92(15). %α = 100, $T_{1/2}$ = 3.6319 *d* (23) (2015SI19). $I\alpha_1$ = 94.92(5), $I\alpha_2$ = 5.06(5), $I\alpha_3$ = 0.0071, $I\alpha_4$ = 0.0076(11), $I\alpha_5$ = 0.0030(5) (2011BR05).	1.542177(86)
^{224}Th→^{220}Ra	Q_α = 7299(6). %α = 100, $T_{1/2}$ = 1.04 *s* (2) (2015SI19). $I\alpha_1$ = 79(2), $I\alpha_2$ = 19(2), $I\alpha_3$ = 1.2(4), $I\alpha_4$ = 0.3(1) (2011BR05).	1.5385(27)
^{224}U→^{220}Th	Q_α = 8628(7). %α = 100 (2015SI19). $T_{1/2}$ = 396 *μs* (17), $I\alpha_1$ = 96.6(8), $I\alpha_2$=3.4(8) (ENSDF updates Nov.-2014).	1.5514(30)
^{226}Ra→^{222}Rn	Q_α = 4870.70(25). %α = 100, $T_{1/2}$ = 1600 *y* (7) (2011SI24). $I\alpha_1$ = 94.07 (1), $I\alpha_2$ = 5.93 (1), $I\alpha_3$ = 0.0059(15) (2017MA22). $I\alpha_4$ = 0.0010(1), $I\alpha_5$ = 0.00027(5) (2011SI24).	1.53945(26)
^{226}Th→^{222}Ra	Q_α = 6452.5(10). %α = 100 (2011SI24). $T_{1/2}$ = 30.83 *min* (1). $I\alpha_1$ = 75.39(10), $I\alpha_2$ = 22.93(9), $I\alpha_3$ = 1.266(7), $I\alpha_4$ = 0.181(4), $I\alpha_5$ = 0.230 (5) (2012MA30). $I\alpha_6$ = 0.00023(2), $I\alpha_7$ = 0.00034(4), $I\alpha_8$ = 0.00017(4) (2011SI24). $T_{1/2}$: WA of 30.70 *min* (3) (2012PO13) , 30.57 *min* (10) (1987MI10) and 30.83 *min* (1) (1995KO54).	1.53749(45)
^{226}U→^{222}Th	Q_α = 7701(4). $T_{1/2}$ = 267 *ms* (9). %α = 100, $I\alpha_1$ = 85(5), $I\alpha_2$ = 15(5) (2011SI24). $T_{1/2}$: WA of 258 *ms* (13) (2002CAZZ), 260 *ms* (20) (2001KU07), 281 *ms* (9) (2000HE17), 260 *ms* (10) (1999GR28, 1998GR19) and 200 *ms* (50) (1990AN22). $I\alpha_1$: 2001Ku07 give $I\alpha_1$ = 85(11), which has been adjusted here as 85(5) from $I\alpha_1$ = 100-$I\alpha_2$.	1.5394(34)
^{228}Th→^{224}Ra	Q_α = 5520.15(22). %α = 100, $T_{1/2}$ = 1.9125 *y* (9), $I\alpha_1$ = 73.4(5), $I\alpha_2$ = 26.0(10), $I\alpha_3$ = 0.408(14), $I\alpha_4$ = 0.218(8), $I\alpha_5$ = 0.036(6), $I\alpha_6$ = 1.0x10^{-5}(3), $I\alpha_7$ = 2.4x10^{-5}(5), $I\alpha_8$ = 1.7x10^{-5}(3), $I\alpha_9$ ≈ 4.6x10^{-6} (2015SI19).	1.53389(32)
^{228}U→^{224}Th	Q_α = 6804(10). %α = 97.5(25), $T_{1/2}$ = 9.1 *min* (2), $I\alpha_1$ = 70(4), $I\alpha_2$ = 29(4), $I\alpha_3$ = 0.66(11), $I\alpha_4$ = 0.56(20) (2015SI19). Iα : $I\alpha_3$ and $I\alpha_4$ branches are questionable.	1.5237(51)
^{228}Pu→^{224}U	Q_α = 7940(18). %α = 100, $T_{1/2}$ = 1.1 *s* (+20-5) (2015SI19). Iα = 100 (1998AK04).	1.480(42)
^{230}Th→^{226}Ra	Q_α = 4769.9(15). %α = 100, $T_{1/2}$ = 7.54x10^4 *y* (3) (2012BR12). $I\alpha_1$ = 76.3(3), $I\alpha_2$ = 23.4(1), $I\alpha_3$ = 0.151(12), $I\alpha_4$ = 0.030(15), $I\alpha_5$ = 9.7x10^{-4}(13), $I\alpha_6$ = 8.0x10^{-6} (20), $I\alpha_7$ = 1.03x10^{-5}(22), $I\alpha_8$ ≈ 3.4x10^{-6}, $I\alpha_9$ = 1.4x10^{-6} (1998AK04).	1.5332 (11)
^{230}U→^{226}Th	Q_α = 5992.5(5). %α = 100, $T_{1/2}$ = 20.23 *d* (2) (2012BR12). $I\alpha_1$ = 67.40(23), $I\alpha_2$ = 31.95(22), $I\alpha_3$ = 0.38(9), $I\alpha_4$ = 0.26(9), $I\alpha_5$ = 0.013(1) (2012MA30). $I\alpha_6$ = 0.00054(5), $I\alpha_7$ ≈ 0.0001, $I\alpha_8$ ≈ 0.00007, $I\alpha_9$ ≈ 0.00025, $I\alpha_{10}$ ≈ 0.00030, $I\alpha_{11}$ ≈ 0.000069 (1998AK04).	1.53197(29)
^{230}Pu→^{226}U	Q_α = 7181(7). %α = 100, $T_{1/2}$ = 102 *s* (10) (2012BR12). $I\alpha_1$ = 81(4), $I\alpha_2$ = 19(4). (ENSDF updates March-2014).	1.5375(56)
^{232}Th→^{228}Ra	Q_α = 4081.6(14). %α = 100, $T_{1/2}$ = 1.40x10^{10} *y* (1), $I\alpha_1$ = 78.2(13), $I\alpha_2$ = 21.7(13), $I\alpha_3$ = 0.069(13) (2014AB04).	1.5370(14)
^{232}U→^{228}Th	Q_α = 5413.63(9). %α = 100, $T_{1/2}$ = 68.9 *y* (4), $I\alpha_1$ = 68.15(23), $I\alpha_2$ = 31.55(23), $I\alpha_3$ = 0.30(2), $I\alpha_4$ = 0.00616(8), $I\alpha_5$ = 5.1x10^{-5}(5), $I\alpha_6$ = 4.8x10^{-5}(4), $I\alpha_7$ = 5.6x10^{-5}(3), $I\alpha_8$ = 2.1x10^{-5}(2), $I\alpha_9$ = 3.9x10^{-6}(9) (2014AB04).	1.52885(29)
^{232}Pu→^{228}U	Q_α = 6716(10). %α = 11(9) (1952OR03, 1973JA06). $T_{1/2}$ = 33.8 *min* (7) (2006BR19). $I\alpha_1$ = 67(5), $I\alpha_2$ = 33(5) (2014AB04).	1.487(50)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
$^{234}U \to ^{230}Th$	Q_α = 4857.5(7). %α = 100, $T_{1/2}$ = 2.455×10^5 *y* (6), Iα_1 = 71.38(16), Iα_2 = 28.42(9), Iα_3 = 0.20(1), Iα_4 = 4x10^{-5}(1), Iα_5 = 2.6x10^{-5}(9), Iα_6 ≈ 0.7x10^{-5} (2012BR12).	1.52224(49)
$^{234}Pu \to ^{230}U$	Q_α = 6310(5). %α = 6(3), $T_{1/2}$ = 8.8 *h* (1), Iα_1 = 68, Iα_2 = 32, Iα_3 = 0.4 (2012BR12). I$\alpha_{1,2}$: Authors assigned 50% uncertainty to Iα_2 i.e. 32(16), which gives Iα_1 = 68(16) and used these values for the calculations of radius parameter.	1.518(27)
$^{236}U \to ^{232}Th$	Q_α = 4572.9(9). %α = 100, $T_{1/2}$ = 2.342x10^7 *y* (4) (2006BR19). Iα_1 = 74.20(5), Iα_2 = 25.68(5), Iα_3 = 0.123(5) (2014MA14)	1.52595(66)
$^{236}Pu \to ^{232}U$	Q_α = 5867.15(8). %α = 100, $T_{1/2}$ = 2.858 *y* (8), Iα_1 = 69.1(3), Iα_2 = 30.8(3), Iα_3 = 0.23, Iα_4 = 1.85x10^{-3}, Iα_5 = 1.3x10^{-5} (2), Iα_6 = 2.6x10^{-4}(1), Iα_7 = 5.8x10^{-4}(10), Iα_8 = 1.3x10^{-5}(1), Iα_9 = 2.46x10^{-6}, Iα_{10} = 6x10^{-7}, Iα_{11} = 1.21x10^{-5}(6), Iα_{12} = 1.33x10^{-5}, Iα_{13} = 1.53x10^{-5} (2006BR19).	1.51022(22)
$^{238}U \to ^{234}Th$	Q_α = 4269.9(21). %α = 100, $T_{1/2}$ = 4.468×10^9 *y* (6) (2004SC03). Iα_1 = 77.01(10), Iα_2 = 22.92(10), Iα_3 = 0.068(10) (2014PO02). $T_{1/2}$: 4.456x10^9 *y* (21) (2018PA45) is a preliminary result, thus not considered here.	1.5350(17)
$^{238}Pu \to ^{234}U$	Q_α = 5593.27(19). %α = 100, $T_{1/2}$ = 87.7 *y* (1) (2015BR06). Iα_1 = 70.91(10) , Iα_2 = 28.98(10), Iα_3 = 0.105(5), Iα_4 = 0.0030(1), Iα_5 = 6.8x10^{-6}(4), Iα_6 = 2.2x10^{-5}, Iα_7 = 5x10^{-5}, Iα_8 = 0.9x10^{-7}(4), Iα_9 = 5.93x10^{-6}(23) , Iα_{10} = 1.2x10^{-5}, Iα_{11} = 2.5x10^{-7}(8), Iα_{12} ≤ 1.3x10^{-7}, Iα_{13} = 1.2x10^{-6}(2), Iα_{14} ≈ 1.1x10^{-6} (2007BR04).	1.50745(13)
$^{238}Cm \to ^{234}Pu$	Q_α = 6670(10). %α = 3.84 (18), $T_{1/2}$ = 2.2 *h* (4) (2015BR06). Iα_1 = 69.5(8), Iα_2 = 30.5(8) (2007BR04).	1.4805(90)
$^{240}Pu \to ^{236}U$	Q_α = 5255.82(14). %α = 100, $T_{1/2}$ = 6561 *y* (7)(2008SI25). Iα_1 = 72.70(7), Iα_2 = 27.21(7), Iα_3 = 0.085(4), Iα_4 = 0.00097(9), Iα_5 = 1.72x10^{-6}(7), Iα_6 = 0.000032 (5) (2010SI30). Iα_7 = 1.3x10^{-8}(7), Iα_8 = 5.9x10^{-7}(7), Iα_9 < 1x10^{-7}, Iα_{10} < 5x10^{-8}, Iα_{11} < 5x10^{-8} (2006BR20).	1.51631(11)
$^{240}Cm \to ^{236}Pu$	Q_α = 6397.8(6). %α > 99.5, $T_{1/2}$ = 27 *d* (1) (2008SI25). Iα_1 = 71.1(8), Iα_2 = 28.9(8), Iα_3 = 0.052, Iα_4 = 0.014 (2006BR20). %α : Given as > 99.5 in 2008SI25 but authors used 99.75(25) to conserve total alpha branching.	1.4947(17)
$^{240}Cf \to ^{236}Cm$	Q_α = 7711(4). %α = 98.5(23) (2010KH06). $T_{1/2}$ = 0.96 *min* (15) (2008SI25). Iα_1 = 68(3), Iα_2 = 32(3) (2006BR20).	1.5027(72)
$^{242}Pu \to ^{238}U$	Q_α = 4984.2(10). $T_{1/2}$ = 3.75x10^5 *y* (2) (1989HO24). %α = 100, Iα_1 = 76.5(6) , Iα_2 = 23.4(6), Iα_3 = 0.0304(14), Iα_4 = 6.20x10^{-4}(3) (2015BR06).	1.51448(75)
$^{242}Cm \to ^{238}Pu$	Q_α = 6215.63(8). $T_{1/2}$ = 162.84 *d* (7). %α = 100, Iα_1 = 74.08(7), Iα_2 = 25.92(6), Iα_3 = 0.035(2), Iα_4 = 0.0046(5), Iα_5 = 2x10^{-5}, Iα_6 = 2.5x10^{-4}(5), Iα_7 = 1.26x10^{-5}(24), Iα_8 = 2.2x10^{-7}(3), Iα_9 = 3.6x10^{-5}(7), Iα_{10} = 1.13x10^{-6}(21), Iα_{11} = 1.7x10^{-6}(4), Iα_{12} ≤ 2x10^{-7}, Iα_{13} = 3.7x10^{-6}(8) , Iα_{14} = 3.1x10^{-7}(8), Iα_{15} = 5.5x10^{-7}(15), Iα_{16} = 5.2x10^{-7}(15) (2015BR06). $T_{1/2}$: WA of 162.5 *d* (20) (1950HA14), 162.46 *d* (27) (1954GL37), 163.0 *d* (18) (1954HU32), 163.2 *d* (2) (1975KE02), 163.1 *d* (4) (1965FL02), 162.76 *d* (4) (1977DI04), 163.02 *d* (11) (1979CH41), 161.35 *d* (10) (1981US03), 163.00 *d* (11) (1982AG02) and 163.0 *d* (2) (1984WI14) is obtained by omitting 161.35(10) (1981US03) as an outlier and inflating the uncertainty in 1977DI04 to 0.06 to bring its weight down to 50%.	1.501258(57)
$^{242}Cf \to ^{238}Cm$	Q_α = 7517(4). %α = 61(3) (2011VE03). $T_{1/2}$ = 3.7 *min* (5) (2002AK06). Iα_1 ≈ 80, Iα_2 ≈ 20 (2015BR06). I$\alpha_{1,2}$: Authors assigned 50% uncertainty to Iα_2 i.e. 17(9), which gives Iα_1 = 83(9) and used these values for the calculations of radius parameter.	1.4986(78)
$^{244}Pu \to ^{240}U$	Q_α = 4665.6(10). %α = 99.877(6), $T_{1/2}$ = 8.13x10^7 *y* (3) (2017NE10). Iα_1 = 80.6(8), Iα_2 = 19.4(8) (2008SI25).	1.50549(82)
$^{244}Cm \to ^{240}Pu$	Q_α = 5901.60(3). %α = 100, $T_{1/2}$ = 18.11 *y* (3) (2017NE10). Iα_1 = 76.9(1), Iα_2 = 23.1(1), Iα_3 = 0.0204(15), Iα_4 = 0.00352(18), Iα_5 = 4x10^{-5}, Iα_6 = 5.6x10^{-5}(5), Iα_7 = 4x10^{-6}(3), Iα_8 = 1.49x10^{-4}(16), Iα_9 = 5.0x10^{-5}(5) (2008SI25).	1.498180(88)
$^{244}Cf \to ^{240}Cm$	Q_α = 7329.0(18). %α = 75(6), $T_{1/2}$ = 19.3 *min* (12) (2018KO05). Iα_1 = 75(8), Iα_2 = 25(8) (2008SI25). %α : 75(+12-6) is used in the calculation of radius parameter as reported alpha branching is somewhat higher than 75%(6) (2018KO05).	1.498(60)
$^{246}Cm \to ^{242}Pu$	Q_α = 5475.1(9). %α = 99.97385(7), $T_{1/2}$ = 4706 *y* (40) (2011BR11). Iα_1 = 79.08(22), Iα_2 = 20.9(4), Iα_3 = 0.020(2) (2007KO01).	1.49412(62)
$^{246}Cf \to ^{242}Cm$	Q_α = 6861.6(10). %α = 100, $T_{1/2}$ = 35.7 *h* (5) (2011BR11). Iα_1 = 79.3(10), Iα_2 = 20.6(10), Iα_3 = 0.15(2), Iα_4 ≈ 0.016 (2002AK06).	1.49528(88)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
^{246}Fm→^{242}Cf	Q_α = 8377(8). %α = 93.2(6), $T_{1/2}$ = 1.54 *s* (4) (2011BR11). $I\alpha_1$ = 80(20), $I\alpha_2$ = 20(20) (2002AK06). r_0 : Calculated radius parameter is based on systematically deduced Iα values.	1.506(12)
^{248}Cm→^{244}Pu	Q_α = 5161.81(25). %α = 91.61(16), $T_{1/2}$ = 3.48x10^5 *y* (6), $I\alpha_1$ = 81.89(41), $I\alpha_2$ = 18.03(19), $I\alpha_3$ = 0.076(12), $I\alpha_4 \leq$ 0.01 (2017NE10).	1.49627(74)
^{248}Cf→^{244}Cm	Q_α = 6361(5). %α = 99.9971 (3), $T_{1/2}$ = 333.5 *d* (28), $I\alpha_1$ = 80.0(10), $I\alpha_2$ = 19.6(10), $I\alpha_3$ = 0.4(2) (2017NE10).	1.4851(24)
^{248}Fm→^{244}Cf	Q_α = 7995(8). %α = 95(5). $T_{1/2}$ = 34.5 *s* (12), $I\alpha_1$ = 80(10), $I\alpha_2$ = 20(10) (2017NE10). $I\alpha_{1,2}$: Uncertainties assumed as 10 units.	1.4945(65)
^{250}Cf→^{246}Cm	Q_α = 6128.51(19). %α = 100, $T_{1/2}$ = 13.08(9) *y*, $I\alpha_1$ = 82.60(11), $I\alpha_2$ = 17.11(11), $I\alpha_3$ = 0.283(15), $I\alpha_4$ = 0.007(2) (2011BR11).	1.48260(30)
^{250}Fm→^{246}Cf	Q_α = 7557(8). %α > 90, $T_{1/2}$ = 30 *min* (2), $I\alpha_1$ = 83(3), $I\alpha_2$ = 17(3) (2011BR11). %α : Authors used %α = 95(5) in the calculations of radius parameter.	1.4789 (48)
^{252}Cf→^{248}Cm	Q_α = 6216.95(4). %α = 96.908(8), $T_{1/2}$ = 2.645 *y* (8), $I\alpha_1$ = 84.1(4), $I\alpha_2$ = 15.0(9), $I\alpha_3$ = 0.25(12), $I\alpha_4$ = 0.0020, $I\alpha_5 \approx$ 6x10^{-5} (2014MA86).	1.50113(23)
^{252}Fm→^{248}Cf	Q_α = 7152.7(20). %α = 99.9977(2) (2005NI22). $T_{1/2}$ = 25.39 *h* (4), $I\alpha_1$ = 84.0(5), $I\alpha_2$ = 15.0(2), $I\alpha_3$ = 0.97(4), $I\alpha_4$ = 0.023(5) (2014MA86).	1.46703(81)
^{252}No→^{248}Fm	Q_α = 8549(5). $T_{1/2}$ = 2.46 *s* (2). %α = 67.8(19), $I\alpha_1 \approx$ 75, $I\alpha_2 \approx$ 25 (2014MA86). $T_{1/2}$: WA of 2.44 *s* (4) (2001OG08), 2.46 *s* (5) (2006LE29), 2.42 *s* (6) (2007SU19), 2.47 *s* (2) (2011GA19) and 2.43 *s* (13) (2012SU22). $I\alpha_{1,2}$: Authors assigned 50% uncertainty to $I\alpha_2$ i.e. 25(13), which gives $I\alpha_1$ = 75(13) and used these values for the calculations of radius parameter.	1.4787(75)
^{254}Cf→^{250}Cm	Q_α = 5927(5). %α = 0.31(16) (1968BE21). $T_{1/2}$ = 60.5 *d* (2) (1963PH01). $I\alpha_1$ = 83(1), $I\alpha_2$ = 17(2) (2001AK11).	1.517(24)
^{254}Fm→^{250}Cf	Q_α = 7307.5(19). $T_{1/2}$ = 3.240 *h* (2) (1967FI03). %α = 99.9408 (3) (2019SI11). $I\alpha_1$ = 85.0(5), $I\alpha_2$ = 14.2(3), $I\alpha_3$ = 0.82(6), $I\alpha_4$ = 0.0066(8) (2001AK11).	1.48871(75)
^{254}No→^{250}Fm	Q_α = 8226(8). %α = 90 (4) (1988TU07). $T_{1/2}$ = 51.2 *s* (4) (2006HE19). $I\alpha_1$ = 86(2) $I\alpha_2$ = 14 (2) (1998AK04).	1.4672(33)
^{256}Fm→^{252}Cf	Q_α = 7027(5). %α = 8.1(3), $T_{1/2}$ = 157.1 *min* (13) (2017SI08). $I\alpha_1$ = 85(5), $I\alpha_2$ = 15(3) (2005NI22). r_0 : Calculated radius parameter is based on systematically deduced Iα values.	1.4989(35)
^{256}No→^{252}Fm	Q_α = 8582(5). %α = 99.47(6), $T_{1/2}$ = 2.91 *s* (5) (2017SI08). $I\alpha_1$ = 87(2), $I\alpha_2$ = 13(2) (2005NI22).	1.4762(19)
^{256}Rf→^{252}No	Q_α = 8926(15). %α = 0.32(17),$T_{1/2}$ = 6.67 *ms* (10)(2017SI08). Iα ≈ 100 (1997HE29). Iα : Only one alpha branch has been reported by 1997HE29. Based on systematics, 2005NI22 suggested 84(4)% branch to g.s. and 16(4)% to the first 2^+ state, which gives r_0 = 1.459(25).	1.466(26)
^{258}Rf→^{254}No	Q_α = 9190(30). %α = 4.9(16), $T_{1/2}$ = 12.0 *ms* (12) (2017SI20). Iα = 85(15) (2019SI11). Iα : 15(15)% is tentatively assigned to the alpha branch to the first 2^+ state in ^{254}No, based on observation of one event in 2008GA08. r_0 : 1.476(17) if 100% branch to the g.s. and none to the excited states.	1.470(18)
^{260}Sg→^{256}Rf	Q_α = 9901(10). %α = 29(3), $T_{1/2}$ = 4.95 *ms* (33), $I\alpha_1$ = 83(10), $I\alpha_2$ = 17(10) (2017SI08).	1.4562(75)
^{264}Hs→^{260}Sg	Q_α = 10591(20). %α = 83(17), $T_{1/2}$ = 0.61 *ms* (+47-19) (2011SA41). Iα = 100. %α : 83(17) is based on 5 alpha decay events observed in 2011Sa41 and 1 event for fission.	1.485(24)
^{266}Hs→^{262}Sg	Q_α = 10346(16). %α = 76(9), $T_{1/2}$ = 2.97 *ms* (+78-51) (2012AC04). Iα = 100.	1.481(12)
^{268}Hs→^{264}Sg	Q_α = 9623(16). %α = 100. $T_{1/2}$ = 0.38 *s* (+180-17) (2010NI14). Iα = 100.	1.458(48)
^{270}Ds→^{266}Hs	Q_α = 11117(28). %α = 100 (2019SI12). $T_{1/2}$ = 0.20 *ms* (+7-4) (2012AC04). Iα = 100.	1.472(12)
^{270}Hs→^{266}Sg	Q_α = 9070(40), %α = 75(25), $T_{1/2}$ = 7.6 *s* (+49-22) (2013OG03). Iα = 100.	1.471(27)
^{286}Fl→^{282}Cn	Q_α = 10370(30). %α = 60(11) (2017OG01). $T_{1/2}$ = 166 *ms* (+40-27) (2016HO09). Iα = 100.	1.441(15)
^{288}Fl→^{284}Cn	Q_α = 10072(13). %α = 100, $T_{1/2}$ = 0.64 *s* (+14-10) (2016HO09). Iα = 100.	1.476(10)
^{290}Lv→^{286}Fl	Q_α = 11000(70). %α = 100 (2016HO09). $T_{1/2}$ = 8.3 *ms* (+35-19) (2017OG01). Iα = 100.	1.486(28)
^{292}Lv→^{288}Fl	Q_α = 10774(15). %α = 100, $T_{1/2}$ = 12.8 *ms* (+70-33) (2016HO09). Iα = 100.	1.516(18)

Continuation of Table II

Alpha Decay	Input Parameters	r_0 (fm)
$^{294}Og \rightarrow ^{290}Lv$	Q_α = 11860(30). %α = 100 (2016HO09). $T_{1/2}$ = 0.58 *ms* (+44-18) (2018BR13). Iα = 100. Q_α : Based on E_α = 11700 keV (30) (2018BR13).	1.461(24)

REFERENCES FOR TABLE II

1923Bo01 W.Bothe - Z.Physik 16, 266 (1923).
Eichmethoden fur Emanationselektrometer.

1924Cu01 I.Curie, C.Chamie - J.Phys.Radium 5, 238 (1924).
Sur la Constante Radioactive du Radon.

1949Bu09 D.E.Bunyan, A.Lundby, W.Walker - Proc.Phys.Soc.(London) 62A, 253 (1949).
Experiments with the Delayed Coincidence Method, Including a Search for Short-Lived Nuclear Isomers.

1950Ha14 G.C.Hanna, B.G.Harvey, N.Moss - Phys.Rev. 78, 617 (1950).
The Half-Life of Cm^{242}.

1951To25 J.Tobailem - Compt.Rend. 233, 1360 (1951).
Mesure Precise de la Periode de Quelques Radioelements.

1952Or03 D.A.Orth - Thesis, Univ.California (1952); UCRL-1059 (Rev.) (1952).
Isotopes of Neptunium and Plutonium.

1954Gl37 K.M.Glover, J.Milsted - Nature 173, 1238 (1954).
Half-Life of Curium-242.

1954Hu32 W.P.Hutchinson, A.G.White - Nature 173, 1238 (1954).
Comment on 1954Gl37.

1954Na25 R.A.Naumann - Phys.Rev. 96, 90 (1954).
Identification of Platinum-188.

1955Sm42 W.G.Smith, J.M.Hollander - Phys.Rev. 98, 1258 (1955).
Radiochemical Study of Neutron-Deficient Chains in the Noble Metal Region.

1955To07 J.Tobailem - J.Phys.Radium 16, 48 (1955).
Mesures Precises de Periodes Radioactives.

1956Ma64 P.C.Marin - Brit.J.Appl.Phys. 7, 188 (1956).
Measurement of the Half-Life of Radon with a Curie-Type Ionization Chamber.

1956Ro31 J.Robert - J.Phys.Radium 17, 605 (1956).
Mesure de la Periode du Radon (^{222}Rn) par Calorimetrie.

1958Sh69 N.S.Shimanskaia - Pribory i Tekh.Ekspt. No.2, 95 (1958); Instr.Exptl. Techniques No.2, 283 (1958).
Determination of the Half-Life Periods of Radioactive Isotopes with the Help of a Double Static Calorimeter.

1961Ma05 R.D.Macfarlane, T.P.Kohman - Phys.Rev. 121, 1758 (1961).
Natural Alpha Radioactivity in Medium-Heavy Elements.

1963As02 G.Astner, I.Bergstrom, L.Eriksson, U.Fagerquist et al. - Nucl.Phys. 45, 49 (1963).
A Hindered E2 Ground State Transition in Po^{207}.

1963Di05 H.Diamond, J.E.Gindler - J.Inorg.Nucl.Chem. 25, 143 (1963).
Alpha Half-Lives of ^{216}Po, ^{217}At and ^{218}Rn.

1963Gr08 G.Graeffe - Ann.Acad.Sci.Fennicae, Ser. A VI, No.128 (1963); Priv.Comm. (1963).
On the Alpha Activity of Platinum Isotopes.

1963Ka17 M.Karras, G.Andersson, M.Nurmia - Arkiv Fysik 23, 57 (1963).
Search for Alpha Activity in Neutron Deficient Isotopes of Pb, Tl, Hg, Pt, and Te.

1963Ph01 L.Phillips, R.C.Gatti, R.Brandt, S.G.Thompson - J.Inorg.Nucl.Chem. 25, 1085 (1963).
Spontaneous Fission Half Lives of Cf^{254}, Fm^{255}, and Cf^{250}.

1965Fl02 K.F.Flynn, L.E.Glendenin, E.P.Steinberg - Nucl.Sci.Eng. 22, 416 (1965).
Half-Life Determinations by Direct Decay.

1965Is01 A.Isola, M.Nurmia - Z.Naturforsch. 20a, 541 (1965).
Alpha Activity of Natural Neodymium.

1966Si08 A.Siivola - Nucl.Phys. 84, 385 (1966).
Alpha-Active Platinum Isotopes.

1967Fi03 P.R.Fields, H.Diamond, A.M.Friedman, J.Milsted et al. - Nucl.Phys. A96, 440 (1967).
Some New Properties of ^{254}Es and ^{255}Es.

1967Va22 K.Valli, W.Treytl, E.K.Hyde - Phys.Rev. 161, 1284 (1967).
On-Line Alpha Spectroscopy of Neutron-Deficient Radium Isotopes.

1968Be21 C.E.Bemis, Jr., J.Halperin - Nucl.Phys. A121, 433 (1968).
The Alpha Decay of ^{253}Cf and ^{254}Cf.

1968De01 A.G.Demin, T.Fenyes, I.Mahunka, V.G.Subbotin, L.Tron - Nucl.Phys. A106, 337 (1968).
New Mercury Isotopes.

1968Lo15 Y.V.Lobanov, V.A.Durin - Yadern.Fiz. 8, 849 (1968); Soviet J.Nucl.Phys. 8, 493 (1969).
Properties of the Isotopes $Ra^{214-206}$.

1970Ha18 P.G.Hansen, H.L.Nielsen, K.Wilsky, M.Alpsten et al. - Nucl.Phys. A148, 249 (1970).
Studies of the α-Active Isotopes of Mercury, Gold, and Platinum.

1972Be89 E.E.Berlovich, Y.S.Blinnikov, P.P.Vaishnis, V.D.Vitman et al. - Izv.Akad.Nauk SSSR, Ser.Fiz. 36, 2490 (1972); Bull.Acad.Sci.USSR, Phys.Ser. 36, 2165 (1973).
Short-Lived Osmium Isotopes.

1972Bu33 D.K.Butt, A.R.Wilson - J.Phys.(London) A5, 1248 (1972).

REFERENCES FOR TABLE II (CONTINUED)

A Study of the Radioactive Decay Law.

1972Fi12 M.Finger, R.Foucher, J.P.Husson, J.Jastrzebski et al. - Nucl.Phys. A188, 369 (1972).
Properties of Low-Lying Levels in the Even Platinum Nuclei (182 < A <192).

1972Mc29 G.W.McBeth, R.A.Winyard - Int.J.Appl.Radiat.Isotop. 23, 527 (1972).
Isotope Identification and Radioassay by Time Interval Analysis.

1973Be33 C.E.Bemis, Jr., R.J.Silva, D.C.Hensley et al. - Phys.Rev.Lett. 31, 647 (1973).
X-Ray Identification of Element 104.

1973Be67 E.E.Berlovich, P.P.Vaishnis, V.D.Vitman, Y.V.Elkin et al. - Izv.Akad.Nauk SSSR, Ser.Fiz. 37, 1052 (1973); Bull.Acad.Sci.USSR, Phys.Ser. 37, No.5, 122 (1974).
Spectroscopic Studies of Short-Lived Neutron-Deficient Nuclei Using the Synchrocyclotron at the Leningrad Institute for Nuclear Physics.

1973Bi06 C.R.Bingham, D.U.O′Kain, K.S.Toth, R.L.Hahn - Phys.Rev. C7, 2575 (1973).
Measurement of α-Decay Branching Ratios for ^{150},^{151}Dy and ^{149m}Tb.

1973Ga08 H.Gauvin, R.L.Hahn, Y.Le Beyec, M.Lefort, J.Livet - Nucl.Phys. A208, 360 (1973).
Reactions of ^{40}Ar with ^{159}Tb, ^{142}Nd and ^{144}Sm; New α-Activities from ^{189}Bi, ^{173}Pt and ^{177}Au.

1973Ha32 O.Hausser, W.Witthuhn, T.K.Alexander, A.B.McDonald et al. - Phys.Rev.Lett. 31, 323 (1973).
Short-Lived α Emitters of Thorium; New Isotopes $^{218-220}$Th.

1973Hi06 K.Hiruta, T.Nomura, T.Inamura, M.Odera - Phys.Lett. 45B, 244 (1973).
Alpha-Particle Decay of ^{218}Th, a New Isotope.

1973Ja06 U.Jager, H.Munzel, G.Pfennig - Z.Phys. 258, 337 (1973).
The Decay of the Neutron Deficient Plutonium Isotopes 232, 233 and 234.

1973No09 T.Nomura, K.Hiruta, T.Inamura, M.Odera - Nucl.Phys. A217, 253 (1973).
Ground-State α-Decay of $N = 128$ Isotones ^{216}Ra, ^{217}Ac and ^{218}Th.

1975Ke02 W.J.Kerrigan, C.J.Banick - J.Inorg.Nucl.Chem. 37, 641 (1975).
Calorimetric Measurement of Alpha Half-Life of ^{242}Cm.

1975Sa06 S.Sanyal, R.K.Garg, S.D.Chauhan, S.L.Gupta, S.C.Pancholi - Phys.Rev. C12, 318 (1975).
Half-Life Measurement of the ^{212}Po Ground State.

1976HoZD P.Hornshoj, P.G.Hansen, E.Hagberg, B.Jonson et al. - Proc.Int.Conf.Nuclei Far from Stability, 3rd, Cargese, France, R.Klapisch, Ed., CERN-76-13, p.171 (1976).
Alpha Decay of Neutron-Deficient Isotopes Studied at 'ISOLDE', CERN.

1977Di04 H.Diamond, W.C.Bentley, A.H.Jaffey, K.F.Flynn - Phys.Rev. C15, 1034 (1977).
Half-Lives of ^{238}Pu and ^{242}Cm.

1978Ro19 E.Roeckl, R.Kirchner, O.Klepper, G.Nyman et al. - Phys.Lett. 78B, 393 (1978).
A New Island of α-Emission: α-Decay Energies and Widths of Neutron Deficient Tellurium, Iodine and Xenon Isotopes.

1979Ch41 Chang Huan-Qiao, Xu Jin-Cheng, Wen Tong-Qing - Chin.J.Nucl.Phys. 1, 21 (1979).
Determination of the Half-Lives of α Disintegration and Spontaneous Fission of ^{242}Cm.

1979Ha10 E.Hagberg, P.G.Hansen, P.Hornshoj, B.Jonson et al. - Nucl.Phys. A318, 29 (1979).
Alpha Decay of Neutron-Deficient Mercury Isotopes and their Daughters.

1979To06 K.S.Toth, M.A.Ijaz, C.R.Bingham, L.L.Riedinger et al. - Phys.Rev. C19, 2399 (1979).
Anomalous α-Decay Rate of ^{192}Pb.

1981Bo29 H.Bohn, E.Endres, T.Faestermann, P.Kienle - Z.Phys. A302, 51 (1981).
Spectroscopy of Excited States in ^{212}Po,^{210}Pb,and ^{213}At Empolying ^{18}O Induced Few-Nucleon Transfer Reactions.

1981De22 S.Della Negra, C.Deprun, D.Jacquet, Y.Le Beyec - Z.Phys. A300, 251 (1981).
Alpha Decay Characteristics of Neutron Deficient Isotopes of Pt Isotopes Produced in ^{63}Cu Induced Reactions on ^{112}Sn and ^{113}In Targets.

1981Ho10 S.Hofmann, G.Munzenberg, F.Hessberger, W.Reisdorf et al. - Z.Phys. A299, 281 (1981).
New Neutron Deficient Isotopes in the Range of Elements Tm to Pt.

1981Pr06 R.J.Prestwood, D.B.Curtis, J.H.Cappis - Phys.Rev. C24, 1346 (1981).
Half-Life of ^{148}Gd.

1981Sc17 D.Schardt, T.Batsch, R.Kirchner, O.Klepper et al. - Nucl.Phys. A368, 153 (1981).
Alpha Decay of Neutron-Deficient Isotopes with $52 \leq Z \leq 55$, Including the New Isotopes ^{106}Te ($T_{1/2}$ = 60 μs) and ^{110}Xe.

1981Us03 S.Usuda, H.Umezawa - J.Inorg.Nucl.Chem. 43, 3081 (1981).
Half-Life of ^{242}Cm.

1982Ag02 S.K.Aggarwal, A.V.Jadhav, S.A.Chitambar, A.R.Parab et al. - Radiochem.Radioanal.Lett. 54, 99 (1982).
Half-Life of ^{242}Cm.

1982Bo04 J.D.Bowman, R.E.Eppley, E.K.Hyde - Phys.Rev. C25, 941 (1982).
Alpha Spectroscopy of Nuclides Produced in the Interaction of 5 GeV Protons with Heavy Element Targets.

1982Ch29 A.Chevallier, J.Chevallier, S.Khazrouni, L.Kraus et al. - J.Phys.(Paris) 43, 1597 (1982).
Low-Lying Yrast States in ^{218}Th.

REFERENCES FOR TABLE II (CONTINUED)

1982En03 H.A.Enge, M.Salomaa, A.Sperduto, J.Ball et al. - Phys.Rev. C25, 1830 (1982).
Neutron Deficient Platinum and Osmium Isotopes Produced in the $^{32}S+{}^{144}Sm$ *Fusion Reaction.*

1984Wi14 R.A.P.Wiltshire - Nucl.Instrum.Methods 223, 535 (1984).
Alpha Spectrometry - A Tool for Nuclear Data Measurements.

1986To02 K.S.Toth, H.J.Kim, M.N.Rao, R.L.Mlekodaj - Phys.Rev.Lett. 56, 2360 (1986).
^{218}Ra *α Reduced Width and Its Consequences for α Clustering in the Heavy Elements.*

1987Al28 B.Al-Bataina, J.Janecke - Radiochim.Acta 42, 159 (1987).
Half-Lives of Long-Lived Alpha Emitters.

1987Mi10 G.J.Miller, J.C.McGeorge, I.Anthony, R.O.Owens - Phys.Rev. C36, 420 (1987).
Half-Lives of the Actinide Nuclei ^{225}Th, ^{226}Th, ^{223}Ac, *and* ^{226}Ac.

1988Tu07 A.Turler, H.W.Gaeggeler, D.T.Jost, P.Armbruster et al. - Z.Phys. A331, 363 (1988).
Determination of the Partial Electron Capture- and Spontaneous-Fission Half-Lives of ^{254}No.

1989Ho24 N.E.Holden - Pure Appl.Chem. 61, 1483 (1989).
Total and Spontaneous Fission Half-Lives for Uranium,Plutonium,Americium and Curium Nuclides.

1989Wo02 P.J.Woods, S.J.Bennett, M.Freer, B.R.Fulton et al. - Nucl.Instrum.Methods Phys.Res. A276, 195 (1989).
A Detection System for the Study of Alpha and Proton Radioactivity onthe Daresbury Recoil Mass Separator.

1990An22 A.N.Andreev, D.D.Bogdanov, V.I.Chepigin, A.P.Kabachenko et al. - Z.Phys. A337, 231 (1990).
The New Nuclide ^{230}Pu.

1990Ho28 N.E.Holden - Pure Appl.Chem. 62, 941 (1990).
Total Half-Lives for Selected Nuclides.

1991Be25 A.Ben Braham, C.Bourgeois, P.Kilcher, F.Le Blanc et al. - Nucl.Phys. A533, 113 (1991).
Structure of Low-Spin States in ^{186}Ir.

1991Se01 P.J.Sellin, P.J.Woods, R.D.Page, S.J.Bennett et al. - Z.Phys. A338, 245 (1991).
The Limit of Stability of Proton-Rich Thallium Isotopes: A search forthe decay of ^{177}Tl.

1992KaZP V.G.Kalinnikov, Sh.Zh.Zaparov, S.V.Evtisov, E.V.Kulikov et al. - Program and Thesis, Proc.42nd Ann.Conf.Nucl.Spectrosc.Struct.At.Nuclei, Alma-Ata, p.80 (1992).
Alpha-Decay of ^{156}Er.

1992Wa14 J.Wauters, P.Dendooven, P.Decrock, M.Huyse et al. - Z.Phys. A342, 277 (1992).
The Alpha-Branching Ratios of the $^{188},^{190},^{192}Pb$ *Isotopes.*

1992Wi14 M.Wieland, J.Fernandez Niello, B.von Fromberg, F.Riess et al. - Phys.Rev. C46, 2628 (1992).
Search for the $I(\pi) = 1^-$ *State in* ^{218}Ra.

1993Me13 F.Meissner, H.Salewski, W.-D.Schmidt-Ott, U.Bosch-Wicke et al. - Phys.Rev. C48, 2089 (1993).
Excited States in Neutron-Deficient Iridium Nuclei Populated in Radioactive Decays of $^{177-181}Pt$.

1993Wa04 J.Wauters, P.Dendooven, M.Huyse, G.Reusen et al. - Phys.Rev. C47, 1447 (1993).
α-Decay Properties of Neutron-Deficient Polonium and Radon Nuclei.

1994Pa11 R.D.Page, P.J.Woods, R.A.Cunningham, T.Davinson et al. - Phys.Rev. C49, 3312 (1994).
Alpha Radioactivity above ^{100}Sn *Including the Decay of* ^{108}I.

1995Co34 R.Colle - Radioact. Radiochem. 6, 16 (1995).
A Precise Determination of the ^{222}Rn *Half-Life by 4π-$\alpha\beta$ Liquid Scintillation Measurements.*

1995Hi02 T.Hild, W.-D.Schmidt-Ott, V.Kunze, F.Meissner et al. - Phys.Rev. C51, 1736 (1995).
α and β Decays of $^{169-173}Os$ *and the Nuclear Structure of the Daughter Isotopes.*

1995KaZS V.G.Kalinnikov, B.P.Osipenko, F.Prazak, A.A.Solnyshkin et al. - Proc.Intern.Conf. on Exotic Nuclei and Atomic Masses, Arles, France, June 19-23, 1995, p.D22 (1995).
The Isomeric State of ^{156m}Ho $(T_{1/2} = 9.5\ s)$.

1995Ko54 A.Koua Aka, V.Barci, G.Ardisson, R.Righetti et al. - Radiochim.Acta 68, 155 (1995).
Reinvestigation of Decay Properties of Nuclei Belonging to the ^{230}U *Series using Continuous Radiochemical Separations.*

1996Bi07 C.R.Bingham, K.S.Toth, J.C.Batchelder, D.J.Blumenthal et al. - Phys.Rev. C54, R20 (1996).
Identification of ^{166}Pt *and* ^{167}Pt.

1996ByZY V.A.Bystrov, I.N.Izosimov, V.G.Kalinnikov, N.Yu.Kotovsky et al. - Program and Thesis, Proc.46th Ann.Conf.Nucl.Spectrosc.Struct.At.Nuclei, Moscow, p.71 (1996).
Alpha-Decay of ^{156}Er *and* ^{157}Tm*. Energy of Beta-Decay of* ^{156}Ho.

1996Le09 M.Leino, J.Uusitalo, R.G.Allatt, P.Armbruster et al. - Z.Phys. A355, 157 (1996).
Alpha Decay Studies of Neutron-Deficient Radium Isotopes.

1996Pa01 R.D.Page, P.J.Wood, R.A.Cunningham, T.Davinson et al. - Phys.Rev. C53, 660 (1996).
Radioactivity of Neutron Deficient Isotopes in the Region $N > 82 > Z$.

1997He29 F.P.Hessberger, S.Hofmann, V.Ninov, P.Armbruster et al. - Z.Phys. A359, 415 (1997).
Spontaneous Fission and Alpha-Decay Properties of Neutron Deficient Isotopes $^{257-253}104$ *and* $^{258}106$.

1997Ja12 Z.Janas, A.Plochocki, J.Szerypo, R.Collatz et al. - Nucl.Phys. A627, 119 (1997).
Decay Studies of the Neutron-Deficient Isotopes $^{114-118}Ba$.

1998Ak04 Y.A.Akovali - Nucl.Data Sheets 84, 1 (1998).
Review of Alpha-Decay Data from Doubly-Even Nuclei.

REFERENCES FOR TABLE II (CONTINUED)

1998Gr19 P.T.Greenlees, N.Amzal, P.A.Butler, K.J.Cann et al. - J.Phys.(London) G24, L63 (1998).
First Observation of Excited States in ^{226}U*.*

1998Mu25 M.Muikku, J.F.C.Cocks, K.Helariutta, P.Jones et al. - Phys.Rev. C58, R3033 (1998).
Probing the Shape of ^{176}Hg *Along the Yrast Line.*

1999Ak02 Y.A.Akovali - Nucl.Data Sheets 87, 249 (1999).
Nuclear Data Sheets for A = 248,252,256,260,264.

1999An22 A.N.Andreyev, N.Bijnens, M.Huyse, P.Van Duppen et al. - J.Phys.(London) G25, 835 (1999).
α-Decay Characteristics of Neutron-Deficient $^{190,192}Po$ *Nuclei andAlpha Branching Ratios of* $^{186,188}Pb$ *Isotopes.*

1999Br24 E.Browne, J.Huo - Nucl.Data Sheets 87, 15 (1999).
Nuclear Data Sheets for A = 174.

1999Gr28 P.T.Greenlees, P.Kuusiniemi, N.Amzal, A.Andreyev et al. - Eur.Phys.J. A 6, 269 (1999).
Fine Structure in the Alpha Decays of ^{226}U *and* ^{230}Pu*.*

1999Po09 G.L.Poli, C.N.Davids, P.J.Woods, D.Seweryniak et al. - Phys.Rev. C59, R2979 (1999).
Proton and α Radioactivity below the Z = 82 Shell Closure.

1999To11 K.S.Toth, C.R.Bingham, J.C.Batchelder, L.T.Brown et al. - Phys.Rev. C60, 011302 (1999).
α-Decay Rates of $^{180,182,184}Pb$ *and the Z = 82 Shell Closure.*

2000An14 A.N.Andreyev, M.Huyse, P.Van Duppen, L.Weissman et al. - Nature(London) 405, 430 (2000).
A Triplet of Differently Shaped Spin-Zero States in the Atomic Nucleus ^{186}Pb*.*

2000Bl21 J.Blachot - Nucl.Data Sheets 91, 135 (2000).
Nuclear Data Sheets for A = 108.

2000He17 F.P.Hessberger, S.Hofmann, D.Ackermann, V.Ninov et al. - Eur.Phys.J. A 8, 521 (2000); Erratum Eur.Phys.J. A 9, 433 (2000).
Decay Properties of Neutron-Deficient Nuclei in the Region Z = 86-92.

2000Je09 D.G.Jenkins, M.Muikku, P.T.Greenlees, K.Hauschild et al. - Phys.Rev. C62, 021302 (2000).
First Observation of Excited States in ^{182}Pb*.*

2000Ko16 F.G.Kondev, M.P.Carpenter, R.V.F.Janssens, I.Wiedenhover et al. - Phys.Rev. C61, 044323 (2000).
High-Spin Collective Structures in ^{178}Pt*.*

2001Ak11 Y.A.Akovali - Nucl.Data Sheets 94, 131 (2001).
Nuclear Data Sheets for A = 250,254,258,262,266.

2001An07 A.N.Andreyev, M.Huyse, P.Van Duppen, L.Weissman et al. - Nucl.Phys. A682, 482c (2001).
The Discovery of a Prolate-Spherical Shape Triple of Spin 0^+ *States in the Atomic Nucleus* ^{186}Pb*.*

2001Ju09 R.Julin, K.Helariutta, M.Muikku - J.Phys.(London) G27, R109 (2001).
Intruder States in Very Neutron-Deficient Hg, Pb and Po Nuclei.

2001Ke06 H.Kettunen, J.Uusitalo, M.Leino, P.Jones et al. - Phys.Rev. C63, 044315 (2001).
α Decay Studies of the Nuclides ^{195}Rn *and* ^{196}Rn*.*

2001Ku07 P.Kuusiniemi, J.F.C.Cocks, K.Eskola, P.T.Greenlees et al. - Acta Phys.Pol. B32, 1009 (2001).
Studies of $^{225,226}U$ *Alpha Decay Chains.*

2001Og08 Yu.Ts.Oganessian, V.K.Utyonkov, Yu.V.Lobanov, F.Sh.Abdullin et al. - Phys.Rev. C64, 054606 (2001).
Measurements of Cross Sections for the Fusion-Evaporation Reactions $^{204,206,207,208}Pb$ + ^{48}Ca *and* ^{207}Pb + ^{34}S*: Decay properties of the even-even nuclides* ^{238}Cf *and* ^{250}No*.*

2002Ak06 Y.A.Akovali - Nucl.Data Sheets 96, 177 (2002).
Nuclear Data Sheets for A = 242.

2002CaZZ P.Cagarda, S.Antalic, D.Ackermann, F.P.Hessberger et al. - GSI 2002-1, p.15 (2002).
New Isotopes ^{233}Cm *and* ^{234}Cm*.*

2002KaZR V.G.Kalinnikov, I.N.Izosimov, J.Adam, Yu.A.Vaganov et al. - Program and Thesis, Proc.52nd Ann.Conf.Nucl.Spectrosc.Struct.At.Nuclei, Moscow, p.83 (2002).
Mass of ^{156}Ho*,* ^{156}Er *and* ^{158}Er *Nuclides.*

2002Ma19 C.Mazzocchi, Z.Janas, L.Batist, V.Belleguic et al. - Phys.Lett. 532B, 29 (2002).
Alpha Decay of ^{114}Ba*.*

2002Ro17 M.W.Rowe, J.C.Batchelder, T.N.Ginter, K.E.Gregorich et al. - Phys.Rev. C65, 054310 (2002).
Decay of ^{178}Tl*.*

2003Ba44 C.M.Baglin - Nucl.Data Sheets 99, 1 (2003).
Nuclear Data Sheets for A = 186.

2003Da06 M.Danchev, D.J.Hartley, F.G.Kondev, M.P.Carpenter et al. - Phys.Rev. C 67, 014312 (2003).
In-beam γ-ray spectroscopy of ^{172}Pt*.*

2003Da24 F.A.Danevich, A.Sh.Georgadze, V.V.Kobychev, B.N.Kropivyansky et al. - Phys.Rev. C 68, 035501 (2003).
Search for 2β decay of cadmium and tungsten isotopes: Final results of the Solotvina experiment.

2003Fu10 Zs.Fulop, L.Bartha, Gy.Gyurky, E.Somorjai et al. - Nucl.Phys. A718, 688c (2003).
The half-life of ^{148}Gd*.*

2003Si05 B.Singh - Nucl.Data Sheets 99, 275 (2003).
Nuclear Data Sheets for A = 190.

REFERENCES FOR TABLE II (CONTINUED)

2003Va05 K.Van de Vel, A.N.Andreyev, R.D.Page, H.Kettunen et al. - Eur.Phys.J. A 17, 167 (2003).
In-beam γ-ray spectroscopy of ^{190}Po: First observation of a low-lying prolate band in Po isotopes.

2003Va16 K.Van de Vel, A.N.Andreyev, D.Ackermann, H.J.Boardman et al. - Phys.Rev. C 68, 054311 (2003).
Fine structure in a α decay of ^{188,192}Po.

2004GoZZ J.TM.Goon - Thesis, University of Tennessee, Knoxville (2004).
Alpha and Gamma-ray Spectroscopic Studies of Au, Pt, and Ir Nuclei Near the Proton Dripline.

2004Sc03 R.Schon, G.Winkler, W.Kutschera - Appl.Radiat.Isot. 60, 263 (2004).
A critical review of experimental data for the half-lives of the uranium isotopes ^{238}U and ^{235}U.

2004Sc04 H.Schrader - Appl.Radiat.Isot. 60, 317 (2004).
Half-life measurements with ionization chambers - A study of systematic effects and results.

2005Bh12 A.Bhagwat, N.J.Thompson, J.K.Tuli - Nucl.Data Sheets 105, 959 (2005).
Nuclear Data Sheets for A = 254.

2005Br03 E.Browne - Nucl.Data Sheets 104, 427 (2005).
Nuclear Data Sheets for A = 212.

2005Ja03 Z.Janas, C.Mazzocchi, L.Batist, A.Blazhev et al. - Eur.Phys.J. A 23, 197 (2005).
Measurements of ^{110}Xe and ^{106}Te decay half-lives.

2005Ku31 P.Kuusiniemi, F.P.Hessberger, D.Ackermann, S.Hofmann et al. - Eur.Phys.J. A 25, 397 (2005).
Decay studies of $^{215-217}$Th using ER-γ-α-γ coincidences.

2005Ni22 N.Nica - Nucl.Data Sheets 106, 813 (2005).
Nuclear Data Sheets for A = 252.

2005Re18 C.W.Reich - Nucl.Data Sheets 105, 557 (2005).
Nuclear Data Sheets for A = 160.

2005Uu02 J.Uusitalo, M.Leino, T.Enqvist, K.Eskola et al. - Phys.Rev. C 71, 024306 (2005).
α decay studies of very neutron-deficient francium and radium isotopes.

2006An36 A.N.Andreyev, S.Antalic, M.Huyse, P.Van Duppen et al. - Phys.Rev.C 74, 064303 (2006).
α decay of the new isotopes ^{193,194}Rn.

2006Ba16 M.S.Basunia - Nucl.Data Sheets 107, 791 (2006).
Nuclear Data Sheets for A = 176.

2006Br19 E.Browne - Nucl.Data Sheets 107, 2579 (2006).
Nuclear Data Sheets for A = 232.

2006Br20 E.Browne, J.K.Tuli - Nucl.Data Sheets 107, 2649 (2006).
Nuclear Data Sheets for A = 236.

2006He19 R.D.Herzberg, P.T.Greenlees, P.A.Butler, G.D.Jones et al. - Nature(London) 442, 896 (2006).
Nuclear isomers in superheavy elements as stepping stones towards theisland of stability.

2006Ja03 A.K.Jain, B.Singh - Nucl.Data Sheets 107, 1027 (2006).
Nuclear Data Sheets for A = 218.

2006Le29 A.-P.Leppanen, J.Uusitalo, P.T.Greenlees, R.-D.Herzberg et al. - Eur.Phys.J. A 28, 301 (2006).
Recoil-fission tagging of the transfermium nucleus ^{252}No.

2006Si17 B.Singh - Nucl.Data Sheets 107, 1531 (2006).
Nuclear Data Sheets for A = 194.

2007Bl18 J.Blachot - Nucl.Data Sheets 108, 2035 (2007).
Nuclear Data Sheets for A = 104.

2007Br04 E.Browne, J.K.Tuli - Nucl.Data Sheets 108, 681 (2007).
Nuclear Data Sheets for A = 234.

2007Hu13 X.Huang - Nucl.Data Sheets 108, 1093 (2007).
Nuclear Data Sheets for A = 196.

2007Ko01 F.G.Kondev, I.Ahmad, J.P.Greene, M.A.Kellett, A.L.Nichols - Appl.Radiat.Isot. 65, 335 (2007).
Measurements of the half-life of ^{246}Cm and the α-decay emission probabilities of ^{246}Cm and ^{250}Cf.

2007Ko42 F.G.Kondev, S.Lalkovski - Nucl.Data Sheets 108, 1471 (2007).
Nuclear Data Sheets for A = 200.

2007Ma45 M.J.Martin - Nucl.Data Sheets 108, 1583 (2007).
Nuclear Data Sheets for A = 208.

2007Re16 C.W.Reich - Nucl.Data Sheets 108, 1807 (2007).
Nuclear Data Sheets for A = 162.

2007Su19 B.Sulignano, S.Heinz, F.P.Hessberger, S.Hofmann et al. - Eur.Phys.J. A 33, 327 (2007).
Identification of a K isomer in ^{252}No.

2007Wu02 S.-C.Wu - Nucl.Data Sheets 108, 1057 (2007).
Nuclear Data Sheets for A = 216.

2008Ba14 C.M.Baglin - Nucl.Data Sheets 109, 1103 (2008).
Nuclear Data Sheets for A = 166.

2008Bi15 L.Bianco, R.D.Page, D.T.Joss, J.Simpson et al. - Nucl.Instrum.Methods Phys.Res. A597, 189 (2008).
α-Decay branching ratios measured by γ-ray tagging.

REFERENCES FOR TABLE II (CONTINUED)

2008De09 D.De Frenne, A.Negret - Nucl.Data Sheets 109, 943 (2008).
Nuclear Data Sheets for A = 106.

2008Ga08 J.M.Gates, M.A.Garcia, K.E.Gregorich, Ch.E.Dullmann et al. - Phys.Rev. C 77, 034603 (2008).
Synthesis of rutherfordium isotopes in the $^{238}U(^{26}Mg, xn)^{264-x}Rf$ *reaction and study of their decay properties.*

2008Ha12 K.Hauschild, A.Lopez-Martens, A.V.Yeremin, O.Dorvaux et al. - Phys.Rev. C 77, 047305 (2008); Erratum Phys.Rev. C 79, 019902 (2009).
Half-life and excitation energy of the $I^{\pi} = 13/2^{+}$ *isomer in* ^{209}Ra.

2008Ko21 F.G.Kondev - Nucl.Data Sheets 109, 1527 (2008).
Nuclear Data Sheets for A = 206.

2008Si25 B.Singh, E.Browne - Nucl.Data Sheets 109, 2439 (2008); Erratum Nucl.Data Sheets 110, 1689(2009).
Nuclear Data Sheets A = 240.

2008Zh05 S.Zhu, F.G.Kondev - Nucl.Data Sheets 109, 699 (2008).
Nuclear Data Sheets for A = 202.

2009Ac01 E.Achterberg, O.A.Capurro, G.V.Marti - Nucl.Data Sheets 110, 1473 (2009).
Nuclear Data Sheets for A = 178.

2009An20 A.N.Andreyev, S.Antalic, D.Ackermann, T.E.Cocolios et al. - Phys.Rev. C 80, 054322 (2009).
α *decay of* $^{180,181}Pb$.

2009De21 D.De Frenne - Nucl.Data Sheets 110, 1745 (2009).
Nuclear Data Sheets for A = 102.

2009Re14 C.W.Reich - Nucl.Data Sheets 110, 2257 (2009).
Nuclear Data Sheets for A = 154.

2009Sa27 M.Sandzelius, E.Ganioglu, B.Cederwall, B.Hadinia et al. - Phys.Rev. C 79, 064315 (2009).
First observation of excited states in ^{172}Hg.

2009Wu02 S.-C.Wu - Nucl.Data Sheets 110, 681 (2009).
Nuclear Data Sheets for A = 214.

2010As03 A.Astier, P.Petkov, M.-G.Porquet, D.S.Delion, P.Schuck - Eur.Phys.J. A 46, 165 (2010).
Coexistence of "a + ^{208}Pb*" cluster structures and single-particle excitations in* $^{212}84Po128$.

2010Ba05 C.M.Baglin - Nucl.Data Sheets 111, 275 (2010).
Nuclear Data Sheets for A = 184.

2010Ba27 C.M.Baglin - Nucl.Data Sheets 111, 1807 (2010).
Nuclear Data Sheets for A = 168.

2010Ch02 C.J.Chiara, F.G.Kondev - Nucl.Data Sheets 111, 141 (2010).
Nuclear Data Sheets for A = 204.

2010He25 J.A.Heredia, A.N.Andreyev, S.Antalic, S.Hofmann et al. - Eur.Phys.J. A 46, 337 (2010).
The new isotope ^{208}Th.

2010Kh06 J.Khuyagbaatar, F.P.Hessberger, S.Hofmann, D.Ackermann et al. - Eur.Phys.J. A 46, 59 (2010).
The new isotope ^{236}Cm *and new data on* ^{233}Cm *and* $^{237,238,240}Cf$.

2010Ni14 K.Nishio, S.Hofmann, F.P.Hessberger, D.Ackermann et al. - Phys.Rev. C 82, 024611 (2010).
Nuclear orientation in the reaction $^{34}S+^{238}U$ *and synthesis of the new isotope* ^{268}Hs.

2010Si30 G.Sibbens, S.Pomme, T.Altzitzoglou, E.Garcia-Torano et al. - Appl.Radiat.Isot. 68, 1459 (2010).
Alpha-particle emission probabilities in the decay of ^{240}Pu.

2011Br05 E.Browne, J.K.Tuli - Nucl.Data Sheets 112, 1115 (2011).
Nuclear Data Sheets for A = 220.

2011Br11 E.Browne, J.K.Tuli - Nucl.Data Sheets 112, 1833 (2011).
Nuclear Data Sheets for A = 246.

2011Ga19 J.M.Gates, Ch.E.Dullmann, M.Schadel, A.Yakushev et al. - Phys.Rev. C 83, 054618 (2011).
First superheavy element experiments at the GSI recoil separator TASCA: The production and decay of element 114 in the $^{244}Pu(^{48}Ca,3\text{-}4n)$ *reaction.*

2011Jo05 T.D.Johnson, D.Symochko, M.Fadil, J.K.Tuli - Nucl.Data Sheets 112, 1949 (2011).
Nuclear Data Sheets for A = 142.

2011Sa41 N.Sato, H.Haba, T.Ichikawa, D.Kaji et al. - J.Phys.Soc.Jpn. 80, 094201 (2011).
Production and Decay Properties of ^{264}Hs *and* ^{265}Hs.

2011Si24 S.Singh, A.K.Jain, J.K.Tuli - Nucl.Data Sheets 112, 2851 (2011).
Nuclear Data Sheets for A = 222.

2011Ve03 M.Venhart, F.P.Hessberger, D.Ackermann, S.Antalic et al. - Eur.Phys.J. A 47, 20 (2011).
Decay study of ^{246}Fm *at SHIP.*

2012Ac04 D.Ackermann - Prog.Theor.Phys.(Kyoto), Suppl. 196, 255 (2012).
Superheavy Elements - A Probe for Nuclear Matter at the Extremes.

2012Ba36 C.M.Baglin - Nucl.Data Sheets 113, 1871 (2012).
Nuclear Data Sheets for A = 192.

2012Be14 P.Belli, R.Bernabei, R.S.Boiko, V.B.Brudanin et al. - Phys.Rev. C 85, 044610 (2012).
Search for double-β *decay processes in* ^{106}Cd *with the help of a* $^{106}CdWO_4$ *crystal scintillator.*

REFERENCES FOR TABLE II (CONTINUED)

2012Br12 E.Browne, J.K.Tuli - Nucl.Data Sheets 113, 2113 (2012).
Nuclear Data Sheets for A = 230.

2012Gu09 G.Gurdal, F.G.Kondev - Nucl.Data Sheets 113, 1315 (2012).
Nuclear Data Sheets for A = 110.

2012Ma30 M.Marouli, S.Pomme, J.Paepen, R.Van Ammel et al. - Appl.Radiat.Isot. 70, 2270 (2012).
High-resolution alpha-particle spectrometry of the ^{230}U decay series.

2012Po13 S.Pomme, G.Suliman, M.Marouli, R.Van Ammel et al. - Appl.Radiat.Isot. 70, 1913 (2012).
Measurement of the ^{226}Th and ^{222}Ra half-lives.

2012Re18 C.W.Reich - Nucl.Data Sheets 113, 2537 (2012).
Nuclear Data Sheets for A = 156.

2012Su11 G.Suliman, S.Pomme, M.Marouli, R.Van Ammel et al. - Appl.Radiat.Isot. 70, 1907 (2012).
Measurements of the half-life of ^{214}Po and ^{218}Rn using digital electronics.

2012Su22 B.Sulignano, Ch.Theisen, J.-P.Delaroche, M.Girod et al. - Phys.Rev. C 86, 044318 (2012).
Investigation of high-K states in ^{252}No.

2012Ve04 M.Venhart, A.N.Andreyev, S.Antalic, L.Bianco et al. - Eur.Phys.J. A 48, 101 (2012).
Determination of α-decay branching ratios for ^{178,179}Hg.

2013An13 A.N.Andreyev, M.Huyse, P.Van Duppen, C.Qi et al. - Phys.Rev.Lett. 110, 242502 (2013).
Signatures of the Z = 82 Shell Closure in α-Decay Process.

2013Ba31 S.K.Basu, A.A.Sonzogni - Nucl.Data Sheets 114, 435 (2013).
Nuclear Data Sheets for A = 150.

2013Be20 V.A.Belov, E.V.Brakhman, O.Ya.Zeldovich, A.K.Karelin et al. - Phys.Atomic Nuclei 76, 397 (2013); Yad.Fiz. 76, 434 (2013).
Measurement of the ^{214}Po Half-Life by the DEVIS Track Setup.

2013Be31 G.Bellini, for the Borexino Collaboration - Eur.Phys.J. A 49, 92 (2013).
Lifetime measurements of ^{214}Po and ^{212}Po with the CTF liquid scintillator detector at LNGS.

2013Ma77 M.J.Martin - Nucl.Data Sheets 114, 1497 (2013).
Nuclear Data Sheets for A = 152.

2013Og03 Yu.Ts.Oganessian, V.K.Utyonkov, F.Sh.Abdullin, S.N.Dmitriev et al. - Phys.Rev. C 87, 034605 (2013).
Synthesis and study of decay properties of the doubly magic nucleus ^{270}Hs in the ^{226}Ra + ^{48}Ca reaction.

2014Ab04 K.Abusaleem - Nucl.Data Sheets 116, 163 (2014).
Nuclear Data Sheets for A=228.

2014Ba41 M.S.Basunia - Nucl.Data Sheets 121, 561 (2014).
Nuclear Data Sheets for A = 210.

2014Ka23 Z.Kalaninova, S.Antalic, A.N.Andreyev, F.P.Hessberger et al. - Phys.Rev. C 89, 054312 (2014).
Decay of $^{201-203}$Ra and $^{200-202}$Fr.

2014Ma14 M.Marouli, S.Pomme, V.Jobbagy, R.Van Ammel et al. - Appl.Radiat.Isot. 87, 292 (2014).
Alpha-particle emission probabilities of ^{236}U obtained by alpha spectrometry.

2014Ma86 M.J. Martin - Nucl.Data Sheets 122, 377 (2014).
Nuclear Data Sheets for A = 248.

2014Ni05 N.Nica - Nucl.Data Sheets 117, 1 (2014).
Nuclear Data Sheets for A = 148.

2014Pe02 P.Peura, C.Scholey, D.T.Joss, S.Juutinen et al. - Phys.Rev. C 89, 024316 (2014).
Quasiparticle alignments and α-decay fine structure of ^{175}Pt.

2014Po01 P.Poml, F.Belloni, E.D′Agata, E.Colineau et al. - Phys.Rev. C 89, 024320 (2014).
Comparison of the α-decay half-life of ^{210}Po implanted in a copper matrix at 4.2 and 293 K.

2014Po02 S.Pomme, E.Garcia-Torano, M.Marouli, M.T.Crespo et al. - Appl.Radiat.Isot. 87, 315 (2014).
High-resolution alpha-particle spectrometry of ^{238}U.

2014Ya19 H.Yang, L.Ma, Z.Zhang, L.Yu et al. - J.Phys.(London) G41, 105104 (2014).
Experiment for synthesis of neutron-deficient protactinium isotopes.

2015Al27 J.B.Albert, for the EXO-200 Collaboration - Phys.Rev. C 92, 045504 (2015).
Measurements of the ion fraction and mobility of α- and β-decay products in liquid xenon using the EXO-200 detector.

2015Be07 E.Bellotti, C.Broggini, G.Di Carlo, M.Laubenstein, R.Menegazzo - Phys.Lett. B 743, 526 (2015).
Precise measurement of the ^{222}Rn half-life: A probe to monitor thestability of radioactivity.

2015Br06 E.Browne, J.K.Tuli - Nucl.Data Sheets 127, 191 (2015).
Nuclear Data Sheets for A = 238.

2015De22 H.M.Devaraja, S.Heinz, O.Beliuskina, V.Comas et al. - Phys.Lett. B 748, 199 (2015).
Observation of new neutron-deficient isotopes with Z≥92 in multinucleon transfer reactions.

2015Kh09 J.Khuyagbaatar, A.Yakushev, Ch.E.Dullmann, D.Ackermann et al. - Phys.Rev.Lett. 115, 242502 (2015).
New Short-Lived Isotope ^{221}U and the Mass Surface Near N = 126.

2015La02 S.Lalkovski, F.G.Kondev - Nucl.Data Sheets 124, 157 (2015).
Nuclear Data Sheets for A = 112.

REFERENCES FOR TABLE II (CONTINUED)

2015Ma37 L.Ma, Z.Y.Zhang, Z.G.Gan, H.B.Yang et al. - Phys.Rev. C 91, 051302 (2015).
α-decay properties of the new isotope ^{216}U.

2015Mc03 E.A.McCutchan - Nucl.Data Sheets 126, 151 (2015).
Nuclear Data Sheets for A = 180.

2015Si18 B.Singh - Nucl.Data Sheets 130, 21 (2015).
Nuclear Data Sheets for A = 182.

2015Si19 S.Singh, B.Singh - Nucl.Data Sheets 130, 127 (2015).
Nuclear Data Sheets for A = 224.

2015Zh41 Q.Z.Zhao, X.M.Wang, W.Wang, M.He et al. - Phys.Rev. C 92, 054616 (2015).
Determination of the α-decay half-life of ^{210}Po based on film andslice bismuth samples at room temperature.

2016Al28 E.N.Alexeyev, Yu.M.Gavrilyuk, A.M.Gangapshev, V.V.Kazalov et al. - Physics of Part.and Nuclei 47, 986 (2016).
Results of a search for daily and annual variations of the ^{214}Po half-life at the two year observation period.

2016Ba60 H.Badran, C.Scholey, K.Auranen, T.Grahn et al. - Phys.Rev. C 94, 054301 (2016).
Confirmation of the new isotope ^{178}Pb.

2016Ca33 L.Capponi, J.F.Smith, P.Ruotsalainen, C.Scholey et al. - Phys.Rev. C 94, 024314 (2016).
Direct observation of the $^{114}Ba \to {}^{110}Xe \to {}^{106}Te \to {}^{102}Sn$ triple α-decay chain using position and time correlations.

2016Ca43 N.Casali, A.Dubovik, S.Nagorny, S.Nisi et al. - J.Low Temp.Physics 184, 952 (2016).
Cryogenic Detectors for Rare Alpha Decay Search: A New Approach.

2016Ho09 S.Hofmann, S.Heinz, R.Mann, J.Maurer et al. - Eur.Phys.J. A 52, 180 (2016).
Review of even element super-heavy nuclei and search for element.

2016Hu04 X.Huang, M.Kang - Nucl.Data Sheets 133, 221 (2016).
Nuclear Data Sheets for A = 198.

2016Kh07 Yu.Khazov, A.Rodionov, G.Shulyak - Nucl.Data Sheets 136, 163 (2016).
Nuclear Data Sheets for A = 146.

2016Pa28 E.Parr, J.F.Smith, P.T.Greenlees, M.Smolen et al. - Phys.Rev. C 94, 014307 (2016).
Identification of the $J^{\pi} = 1^-$ state in ^{218}Ra populated via α decay of ^{222}Th.

2016So01 A.H.M.Solieman, M.Al-Abyad, F.Ditroi, Z.A.Saleh - Nucl.Instrum.Methods Phys.Res. B366, 19 (2016).
Experimental and theoretical study for the production of ^{51}Cr using p, d, ^{3}He and ^{4}He projectiles on V, Ti and Cr targets.

2017Ap03 E.Aprile, for the XENON Collaboration - Phys.Rev. D 95, 072008 (2017).
Results from a calibration of XENON100 using a source of dissolved radon-220.

2017Br04 M.Braun, Y.M.Georgiev, T.Schonherr, H.Wilsenach, K.Zuber - Phys.Lett. B 768, 317 (2017).
A new precision measurement of the α-decay half-life of ^{190}Pt.

2017Ma22 M.Marouli, S.Pomme, R.Van Ammel, E.Garcia-Torano et al. - Appl.Radiat.Isot. 125, 196 (2017).
Direct measurement of alpha emission probabilities in the decay of ^{226}Ra.

2017Na22 L.J.Nadderd, K.M.Subotic, Yu.S.Tsyganov, J.M.Puzovic et al. - Nucl.Instrum.Methods Phys.Res. A868, 119 (2017).
Measurement of the life-times distribution of ^{216}Po.

2017Ne10 C.D.Nesaraja - Nucl.Data Sheets 146, 387 (2017).
Nuclear Data Sheets for A=244.

2017Ni05 N.Nica - Nucl.Data Sheets 141, 1 (2017).
Nuclear Data Sheets for A=158.

2017Og01 Y.T.Oganessian, A.Sobiczewski, G.M.Ter-Akopian - Phys.Scr. 92, 023003 (2017).
Superheavy nuclei: from predictions to discovery.

2017Si08 B.Singh - Nucl.Data Sheets 141, 327 (2017).
Nuclear Data Sheets for A=256.

2017Si20 B.Singh - Nucl.Data Sheets 144, 297 (2017).
Nuclear Data Sheets for A = 258.

2017Su18 M.D.Sun, Z.Liu, T.H.Huang, W.Q.Zhang et al. - Phys.Lett. B 771, 303 (2017).
New short-lived isotope ^{223}Np and the absence of the Z = 92 subshell closure near N = 126.

2017Wa10 M.Wang, G.Audi, F.G.Kondev, W.J.Huang et al. - Chin.Phys. C 41, 030003 (2017).
The AME2016 atomic mass evaluation.

2018Ba41 C.M.Baglin, E.A.McCutchan, S.Basunia, E.Browne - Nucl.Data Sheets 153, 1 (2018).
Nuclear Data Sheets for A=170.

2018Ba44 A.S.Barabash, P.Belli, R.Bernabei, F.Cappella et al. - Phys.Rev. D 98, 092007 (2018).
Final results of the Aurora experiment to study 2β decay of $^{116}Cd$with enriched $^{116}CdWO_4$ crystal scintillators.

2018Br13 N.T.Brewer, V.K.Utyonkov, K.P.Rykaczewski, Yu.Ts.Oganessian et al. - Phys.Rev. C 98, 024317 (2018).
Search for the heaviest atomic nuclei among the products from reactions of mixed-Cf with a ^{48}Ca beam.

2018Ko05 J.Konki, B.Sulignano, P.T.Greenlees, Ch.Theisen et al. - Phys.Rev. C 97, 024306 (2018).
In-beam spectroscopic study of ^{244}Cf.

REFERENCES FOR TABLE II (CONTINUED)

2018Ko15 F.G.Kondev, S.Juutinen, D.J.Hartley - Nucl.Data Sheets 150, 1 (2018).
Nuclear Data Sheets for A=188.

2018Ni16 N.Nica - Nucl.Data Sheets 154, 1 (2018).
Nuclear Data Sheets for A=140.

2018Pa45 T.Parsons-Davis, J.Wimpenny, C.B.Keller, K.Thomas et al. - J.Radioanal.Nucl.Chem. 318, 711 (2018).
New measurement of the ^{238}U decay constant with inductively coupled plasma mass spectrometry.

2018Po01 S.Pomme, G.Lutter, M.Marouli, K.Kossert, O.Nahle - Astropart.Phys. 97, 38 (2018).
On the claim of modulations in radon decay and their association withsolar rotation.

2018Sh12 A.Shor, L.Weissman, O.Aviv, Y.Eisen et al. - Phys.Rev. C 97, 034303 (2018).
Branching ratio to the 803 keV level in ^{210}Po α decay.

2018Si01 B.Singh, J.Chen - Nucl.Data Sheets 147, 1 (2018).
Nuclear Data Sheets for A=164.

2019Hi06 J.Hilton, J.Uusitalo, J.Saren, R.D.Page et al. - Phys.Rev. C 100, 014305 (2019).
α-spectroscopy studies of the new nuclides ^{165}Pt and ^{170}Hg.

2019Mo01 P.Moller, M.R.Mumpower, T.Kawano, W.D.Myers - At.Data Nucl.Data Tables 125, 1 (2019).
Nuclear properties for astrophysical and radioactive-ion-beam applications (II).

2019Pa45 E.Parr, J.F.Smith, P.T.Greenlees, K.Auranen et al. - Phys.Rev. C 100, 044323 (2019).
α-decay spectroscopy of the N=130 isotones ^{218}Ra and ^{220}Th: Mitigation of α-particle energy summing with implanted nuclei.

2019Si11 B.Singh - Nucl.Data Sheets 156, 1 (2019).
Nuclear Data Sheets for A=254.

2019Si12 B.Singh - Nucl.Data Sheets 156, 70 (2019).
Nuclear Data Sheets for A=266,270,274,278,282,286,290,294,298.

2019Si39 B.Singh, M.S.Basunia, M.Martin, E.A.McCutchan et al. - Nucl.Data Sheets 160, 405 (2019).
Nuclear Data Sheets for A=218.

2020Cu02 J.G.Cubiss, R.D.Harding, A.N.Andreyev, N.Althubiti et al. - Phys.Rev. C 101, 014314 (2020).
α-decay branching ratio of ^{180}Pt.

2019HaAA R.D. Harding, paper in preparation (2019), and priv. comm. (Dec 12, 2019).

2019CuBB J. G. Cubiss et al., paper in preparation (2019), and priv. comm. (Dec 12, 2019).

2020Ca15 V.Caracciolo, S.S.Nagorny, P.Belli, R.Bernabei et al. - Nucl.Phys. A 1002, 121941 (2020).
Search for α decay of naturally occuring Hf-nuclides using a Cs_2HfCl_6 scintillator.