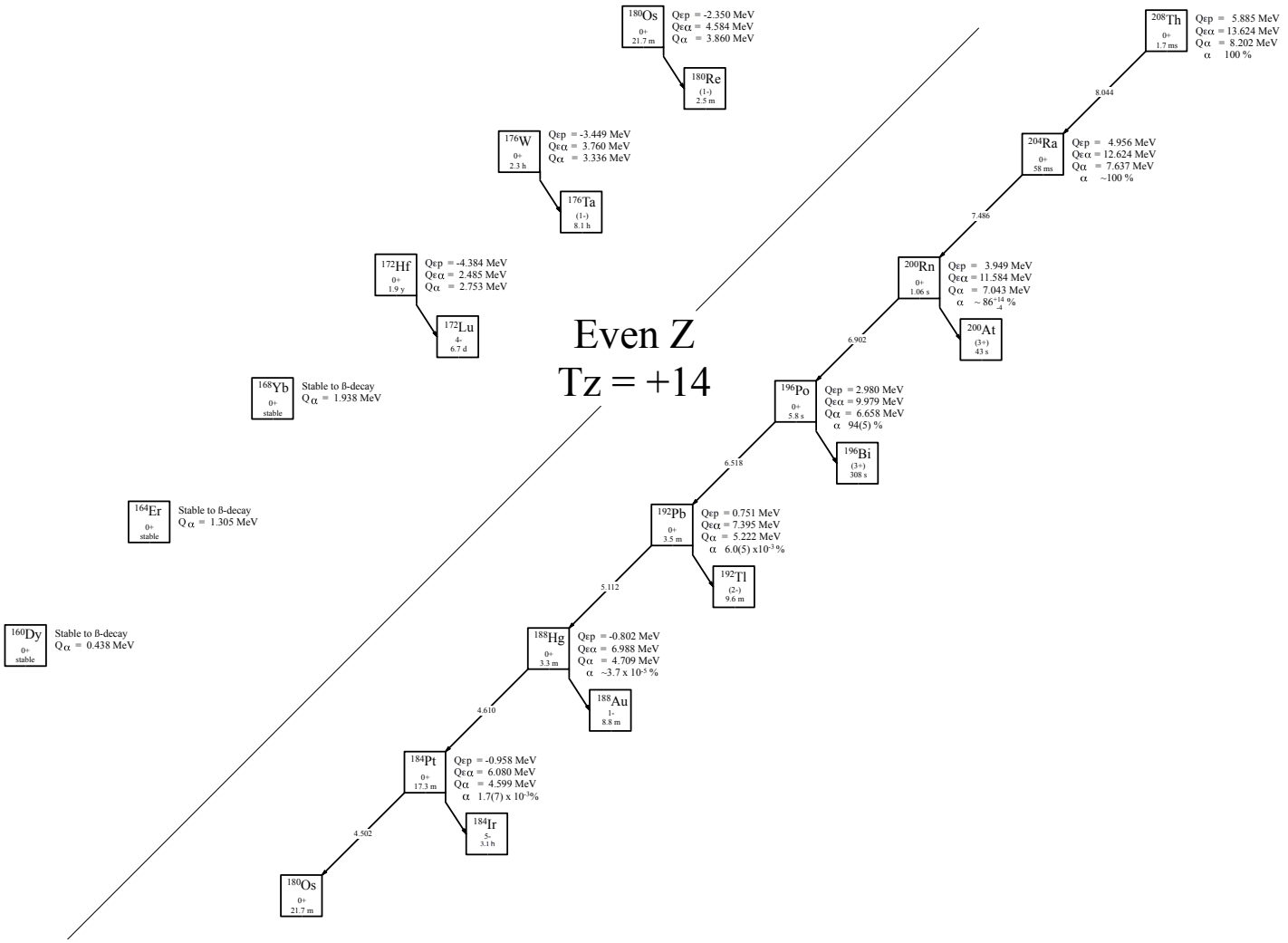

Fig. 1: Known experimental values for heavy particle emission of the even-Z T_z= +14 nuclei.

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Table 1
Observed and predicted β-delayed particle emission from the even-Z, $T_z = +14$ nuclei. Unless otherwise stated, all Q-values are taken from [2021Wa16] or deduced from values therein.

Nuclide	J^π	$T_{1/2}$	Q_ε	$Q_{\varepsilon p}$	$Q_{\varepsilon\alpha}$	Experimental
^{160}Dy	0^+	stable	——	——	——	
^{164}Er	0^+	stable	——	——	——	
^{168}Yb	0^+	stable	——	——	——	
^{172}Hf	0^+	1.86(3) y	0.334(25)	-4.384(24)	2.485(24)	[**1971Ch57**]
^{176}W	0^+	2.3(1) h	0.720(40)	-3.449(28)	3.670(28)	[**1963Va20**]
^{180}Os	0^+	21.7(6) m	1.481(27)	-2.350(21)	4.584(35)	[**1966Ho16**]
^{184}Pt	0^+	17.3(2) m	2.280(30)	-0.958(52)	6.080(26)	[**1972Fi12**]
^{188}Hg	0^+	3.25(15) m	2.173(7)	-0.802(25)	6.988(29)	[**1972Fi12**]
^{192}Pb	0^+	3.5(1) m	3.320(30)	0.751(23)	7.395(6)	[**1979To06**]
^{196}Po	0^+	5.8(2) s	4.540(25)	2.980(7)	9.979(32)	[**1985Va03**]
^{200}Rn	0^+	1.06(2) s	4.987(25)	3.949(8)	11.584(25)	[**1984Ca32**]
^{204}Ra	0^+	58^{+10}_{-7} ms*	5.454(26)	4.956(11)	12.624(26)	[**2005Uu02, 1996Le09**]
^{208}Th	0^+	$1.7^{+1.7}_{-0.6}$ ms	5.930(70)	5.885(66)	13.656(40)	[**2010He25**]

* Weighted average of 54^{+19}_{-11} ms [2005Uu02] and 59^{+12}_{-9} ms [1996Le09].

Table 2
Particle separation, Q-values, and measured values for direct particle emission of the even-Z, $T_z = +14$ nuclei. Unless otherwise stated, all S and Q-values are taken from [2021Wa16] or deduced from values therein.

Nuclide	S_p	S_{2p}	Q_α	BR_α	Experimental
^{160}Dy	7.429(1)	13.560(1)	0.438(1)		
^{164}Er	6.854(0)	12.339	1.305(0)		
^{168}Yb	6.326(1)	11.234	1.938(1)		
^{172}Hf	5.863(24)	10.216(24)	2.753(24)		
^{176}W	5.522(40)	9.375(28)	3.336(37)		
^{180}Os	5.061(29)	8.527(22)	3.860(32)		
^{184}Pt	4.419(29)	7.301(26)	4.599(8)	$1.7(7)\times10^{-3}$%	[**1995Bi01**, 1993BiZY, 1966Si08, 1963Gr08]
^{188}Hg	4.459(24)	6.912(23)	4.709(15)	$\approx3.7\times10^{-5}$%	[**1979Ha10**, 1993ToZY]
^{192}Pb	3.558(9)	5.759(17)	5.222(5)	$6.0(5)\times10^{-3}$%*	[**1992Wa14, 1979To06**, 1992WaZV, 1984To09, 1974Ho16, 1974Le02]
^{196}Po	2.732(8)	3.839(18)	6.658(2)	94(5)%	[**1996Ta18, 1993Wa04, 1985Va03**, 2016Tr07, 1993WaZO, 1992WaZV, 1967Si09, 1967Tr06, 1965Si22]
^{200}Rn	2.466(8)	3.105(18)	7.043(2)	86^{+14}_{-4}%	[**1995Bi17, 1993Wa04, 1984Ca32**, 2015We15, 2005Uu02 1995BiZY, 1992WaZV, 1971Ho01]
^{204}Ra	2.104(11)	2.242(20)	7.637(7)	$\approx$ 100%**	[**2005Uu02, 1996Le09, 1995Le04**, 1995Le15, 1995LeZY]
^{208}Th	1.747(65)	1.456(37)	8.202(31)	100%	[**2010He25**]

* Weighted average of $6.2(6)\times10^{-3}$% [1992Wa14] and $5.7(10)\times10^{-3}$% [1979To06].
** Based on short half-life.

Table 3
direct α emission from ^{184}Pt*, $J_i^\pi = 0^+$, $T_{1/2}$ = 17.3(2) m**, $BR_\alpha = 1.7(7)\times10^{-3}$%.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{180}Os)	coincident γ-rays	R_0 (fm)	HF
4.602(10)	4.502(10)	$1.7(7)\times10^{-3}$%	0^+	0.0	——	1.542(27)	$1.0^{+0.7}_{-0.3}$

* All values from [1995Bi01], except where noted.
** [1972Fi12].

Table 4
direct α emission from ^{188}Hg*, $J_i^\pi = 0^+$, $T_{1/2}$ = 3.25(15) m**, $BR_\alpha = \approx3.7\times10^{-5}$%.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{184}Pt)	coincident γ-rays	R_0 (fm)	HF
4.710(20)	4.610(20)	$1.7(7)\times10^{-3}$%	0^+	0.0	——	1.480(15)	1.01

* All values from [1979Ha10], except where noted.
** [1972Fi12].

Table 5
direct α emission from ^{192}Pb*, $J_i^\pi = 0^+$, $T_{1/2}$ = 3.5(1) m, $BR_\alpha = 6.0(5)\times10^{-3}$%**.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{188}Hg)	coincident γ-rays	R_0 (fm)	HF
5.221(5)	5.112(5)	$6.0(5)\times10^{-3}$%**	0^+	0.0	——	1.5126(28)	0.98(9)

* All values from [1979To06], except where noted.
** Weighted average of $6.2(6)\times10^{-3}$% [1992Wa14] and $5.7(10)\times10^{-3}$% [1979To06].

Table 6
direct α emission from ^{196}Po, $J_i^\pi = 0^+$, $T_{1/2}$ = 5.8(2) s*, BR_α = 94(5)%**.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{192}Pb)	coincident γ-rays	R_0 (fm)	HF
6.654(1)	6.518(1)***	94(5)%**	0^+	0.0	——	1.5005(86)	1.00(6)

Table 7
direct α emission from ^{200}Rn, $J_i^\pi = 0^+$, $T_{1/2}$ = 1.06(2) s*, $BR_\alpha = 86^{+14}_{-4}$%**.

E_α(c.m.)	E_α(lab)	I_α(abs)	I_α(abs)	J_f^π	$E_{daughter}$(^{196}Po)	coincident γ-rays	R_0 (fm)	HF
6.485(6)	6.355(6)	$6(2)\times10^{-3}$%	$5.2^{+10}_{-5}\times10^{-3}$%	0^+	0.558(7)		1.5205(93)	140^{+90}_{-40}
6.586(4)	6.454(4)	$8.1(7)\times10^{-3}$%	$7.0^{+14}_{-9}\times10^{-3}$%	2^+	0.4631(1)$^@$	0.4631(1)$^@$	1.5205(93)	242^{+60}_{-24}
7.0433(25)	6.9024(25)	100%	86^{+14}_{-4}%	0^+	0.0	——	1.5205(93)	1.3^{+4}_{-1}

* [1984Ca32].
** [1993Wa04].
*** [1996Tr18].
$^@$ [2007Hu13].

Table 8
direct α emission from ^{204}Ra, $J_i^\pi = 0^+$, $T_{1/2} = 58^{+10}_{-7}$ ms*, $BR_\alpha = \approx 100\%$.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{200}Rn)	coincident γ-rays	R_0 (fm)	HF
7.636(6)	7.486(6)**	$\approx$ 100%	0^+	0.0	——	1.525(14)	1.07(19)

* Weighted average of 54^{+19}_{-11} ms [2005Uu02] and 59^{+12}_{-9} ms [1996Le09].
** Weighted average of 7.486(8) MeV [2005Uu02], 7.484(10) MeV [1996Le09], and 7.488(12) MeV [1995Le04].

Table 9
direct α emission from ^{208}Th*, $J_i^\pi = 0^+$, $T_{1/2} = 1.7^{+1.7}_{-0.6}$ ms, BR_α = 100%.

E_α(c.m.)	E_α(lab)	I_α(abs)	J_f^π	$E_{daughter}$(^{204}Ra)	coincident γ-rays	R_0 (fm)	HF
8.202(30)	8.044(30)	100%	0^+	0.0	——	1.555(18)	$0.66^{+0.66}_{-0.24}$

* All values from [2010He25].

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