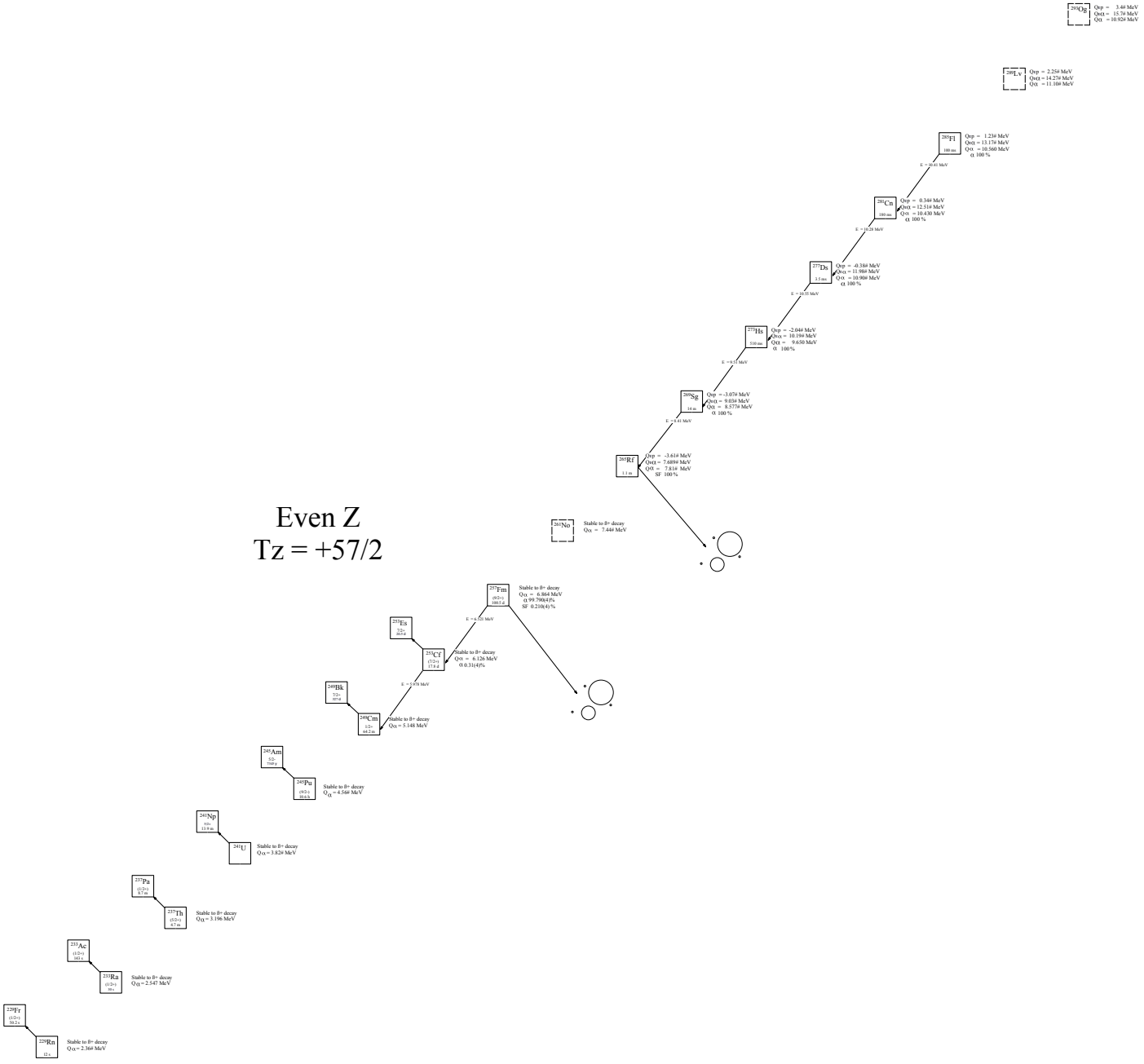

Fig. 1: Known experimental values for heavy particle emission of the even-Z T_z= +57/2 nuclei.

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Table 1
Observed and predicted β-delayed particle emission from the even-Z, T_z = +57/2 nuclei. Unless otherwise stated, all Q-values are taken from [2021Wa16] or deduced from values therein. J^π values are taken from ENSDF.

Nuclide	J^π	$T_{1/2}$	Q_ε	Q_{β^-}	$Q_{\beta^- \alpha}$	Experimental
^{229}Rn*		$12.0^{+1.2}_{-1.3}$ s	-5.53(40)#	3.694(14)	6.82(30)#	[**2009Ne03**]
^{233}Ra*	$(1/2^+)$	30(5) s	-4.586(21)	3.026(16)	6.421(10)	[**1990Me13**]
^{237}Th*	$(5/2^+)$	4.69(60) m	-4.07(40)#	2.427(21)	6.402(21)	[**2000Xu02**]
^{241}U*		obs	-3.54(36)#	1.88(22)#	6.43(20)#	[**2023Ni04**]
^{245}Pu*	$(9/2^-)$	10.59(2) h	-2.67(20)#	1.278(14)	6.61(10)	[**1967Bu09**]
^{249}Cm*	$1/2^+$	64.15(3) m	-2.35(30)#	0.904(3)	6.605(3)	[**1973DrZM**]
^{253}Cf	$(7/2^+)$	17.81(8) d	-1.63(36)#	0.291(4)	7.211(4)	[**1969DrZZ**]
				$Q_{\varepsilon p}$	$Q_{\varepsilon \alpha}$	
^{257}Fm	$(9/2^+)$	100.5(2) d	-0.81(41)#	—	—	[**1973Wi03**]
^{261}No			-0.12(55)#	—-	—	
^{265}Rf		$1.1^{+0.8}_{-0.3}$ m	0.46(66)#	-3.61(69)#	7.689(66)#	[**2018Ut02**]
^{269}Sg		14^{+10}_{-4} m	0.54(72)#	-3.07(76)#	9.03(72)#	[**2018Ut02**]
^{273}Hs		$0.51^{+0.30}_{-0.14}$ s	1.08(75)#	-2.04(79)#	10.19(75)#	[**2018Ut02**]
^{277}Ds		$3.5^{+2.1}_{-0.9}$ ms	2.08(77)#	-0.38(82)#	11.98(77)#	[**2018Ut02**]
^{281}Cn		180^{+100}_{-50} ms	2.61(87)#	0.34(85)#	12.51(77)#	[**2018Ut02**]
^{285}Fl		100^{+60}_{-30} ms	3.16(87)#	1.23(86)#	13.17(87)#	[**2018Ut02**]
^{289}Lv			3.77(93)#	2.25(91)#	14.27(92)#	
^{293}Og			4.4(11)#	3.4(10)#	15.7(11)#	

* 100% β^--emitter.

Table 2
Particle separation, Q-values, and measured values for direct particle emission of the even-Z, T_z = +57/2 nuclei. Unless otherwise stated, all S and Q-values are taken from [2021Wa16] or deduced from values therein.

Nuclide	S_p	Q_α	BR_α	BR_{SF}	Experimental
^{229}Rn	9.81(40)#	2.36(30)#			
^{233}Ra	9.028(16)	2.547(16)			
^{237}Th	8.555(41)	3.196(18)			
^{241}U	8.10(28)#	3.82(20)#			
^{245}Pu	7.35(10)#	4.56(20)#			
^{249}Cm	7.10(20)#	5.148(13)			
^{253}Cf	6.52(20)#	6.126(4)	0.31(4)%		[**1968Be21, 1966Rg01**, 1968BeZY, 1966Rg01]
^{257}Fm	5.88(10)#	6.864(1)	99.790(4)%	0.210(4)%	[**1982Ah01, 1973Wi03**, 2000Ho27, 1998SiZX, 1985Wi10, 1974BaXU, 1973BaTX, 1973Ve10, 1971Ba03, 1971Ch14, 1971Jo13, 1967As02, 1966Rg01, 1965Si14, 1964Hu02, 1962Br45, 1962Ga24]
^{261}No	5.38(37)#	7.44(20)#			
^{265}Rf	4.97(57)#	7.81(30)#		100%	[**2018Ut02, 2015Ut02, 2010El06**]
^{269}Sg	4.66(65)#	8.577(75)	100%*		[**2018Ut02, 2015Ut02, 2010El06**]
^{273}Hs	4.301(65)#	9.650(64)	100%*		[**2018Ut02, 2015Ut02, 2010El06**]
^{277}Ds	3.51(66)#	10.90(12)#	100%*		[**2018Ut02, 2015Ut02, 2010El06**]
^{281}Cn	3.23(66)#	10.430(64)	100%*		[**2018Ut02, 2015Ut02, 2010El06**]
^{285}Fl	2.95(67)#	10.560(71)	100%*		[**2018Ut02, 2015Ut02, 2010El06**]
^{289}Lv	2.50(74)#	11.10(30)#			
^{293}Og	2.11(98)#	11.92(50)#			

* Only α-decay has been observed.

Table 3
direct α emission from ^{253}Cf*, J^{π} = (7/2$^+$), $T_{1/2}$ = 17.81(8) d**, BR_{α} = 0.31(4)%***.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(rel)	I_{α}(abs)	J^{π}_f	$E_{daughter}$(^{249}Cm)	coincident γ-rays (keV)	HF	
6.015(5)	5.920(5)	5.5(20)%	0.016(6)%	(9/2$^+$)	0.110		1.509(12)	11^{+8}_{4}
6.076(5)	5.978(5)	100%	0.29(4)%	(7/2$^+$)	0.050		1.509(12)	$1.3^{+0.5}_{-0.4}$

* All values from [1993Mo18], except where noted. E_{α} values are adjusted by -0.6 keV as recommended in [1991Ry01].
** [1969DrZZ].
*** [1966Ryg01].

Table 4
direct α emission from ^{257}Fm*, J^{π} = (9/2$^+$), $T_{1/2}$ = 100.5(2) d**, BR_{α} = 99.790(4)%**.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(rel)	I_{α}(abs)	J^{π}_f	$E_{daughter}$(^{253}Cf)	coincident γ-rays (keV)	HF	
6.447(5)	6.347(5)	0.3(1)%	0.3(1)%	(13/2$^+$)	0.417		1.5040(53)	60^{+32}_{-17}
6.544(3)	6.442(3)	2.1(2)%	2.0(2)%	(7/2$^+$)	0.3212	61.6, 75.0, 80.2, 104.4, 136.7, 179.4, 241.0	1.5040(53)	26^{+5}_{-4}
6.624(2)	6.521(2)	100%	93.6(10)%	(11/2$^+$)	0.2410	61.6, 75.0, 104.4, 136.7, 179.4, 241.0	1.5040(53)	1.3(2)
6.802(3)	6.696(3)	3.7(3)%	3.5(3)%	(9/2$^+$)	0.0616	61.6	1.5040(53)	230(40)
6.864(3)	6.757(3)	0.64(6)%	0.60(6)%	(7/2$^+$)	0.0	——	1.5040(53)	$2.5^{+0.5}_{-0.4}\times10^3$

* All values from [1982Ah01], except where noted. E_{α} values are adjusted by +0.5 keV as recommended in [1991Ry01].
** [1973Wi03].

Table 5
direct α emission from ^{269}Sg*, $T_{1/2} = 14^{+10}_{-4}$ m, BR_{α} = 100%**.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(abs)	J^{π}_f	$E_{daughter}$(^{265}Rf)	coincident γ-rays (keV)	HF
8.54(4)	8.41(4)	100%				

* All values from [2018Ut02]. The reported values are from that work and [2015Ut02, 2010El06].
** Only α-decay has been observed.

Table 6
direct α emission from ^{273}Hs*, $T_{1/2} = 0.51^{+0.30}_{-0.14}$ s, BR_{α} = 100%**.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(abs)	J^{π}_f	$E_{daughter}$(^{269}Sg)	coincident γ-rays (keV)	HF
9.65(4)	9.51(4)	100%				

* All values from [2018Ut02]. The reported values are from that work and [2015Ut02, 2010El06].
** Only α-decay has been observed.

Table 7
direct α emission from ^{277}Ds*, $T_{1/2} = 3.5^{+2.1}_{-0.9}$ ms, BR_{α} = 100%**.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(abs)	J^{π}_f	$E_{daughter}$(^{273}Hs)	coincident γ-rays (keV)	HF
10.70(4)	10.55(4)	100%				

* All values from [2018Ut02]. The reported values are from that work and [2015Ut02, 2010El06].
** Only α-decay has been observed.

Table 8
direct α emission from ^{281}Cn*, $T_{1/2} = 180^{+100}_{-50}$ ms, BR_{α} = 100%**.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(abs)	J^{π}_f	$E_{daughter}$(^{277}Ds)	coincident γ-rays (keV)	HF
10.43(4)	10.28(4)	100%				

* All values from [2018Ut02]. The reported values are from that work and [2015Ut02, 2010El06].
** Only α-decay has been observed.

Table 9
direct α emission from ^{285}Fl*, $T_{1/2} = 100^{+60}_{-30}$ ms, $BR_\alpha = 100\%$**.

E_α(c.m.)	E_α(lab)	I_α(abs)	J^π_f	$E_{daughter}(^{277}Ds)$	coincident γ-rays (keV)	HF
10.56(4)	10.41(4)	100%				

* All values from [2018Ut02]. The reported values are from that work and [2015Ut02, 2010El06].
** Only α-decay has been observed.

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