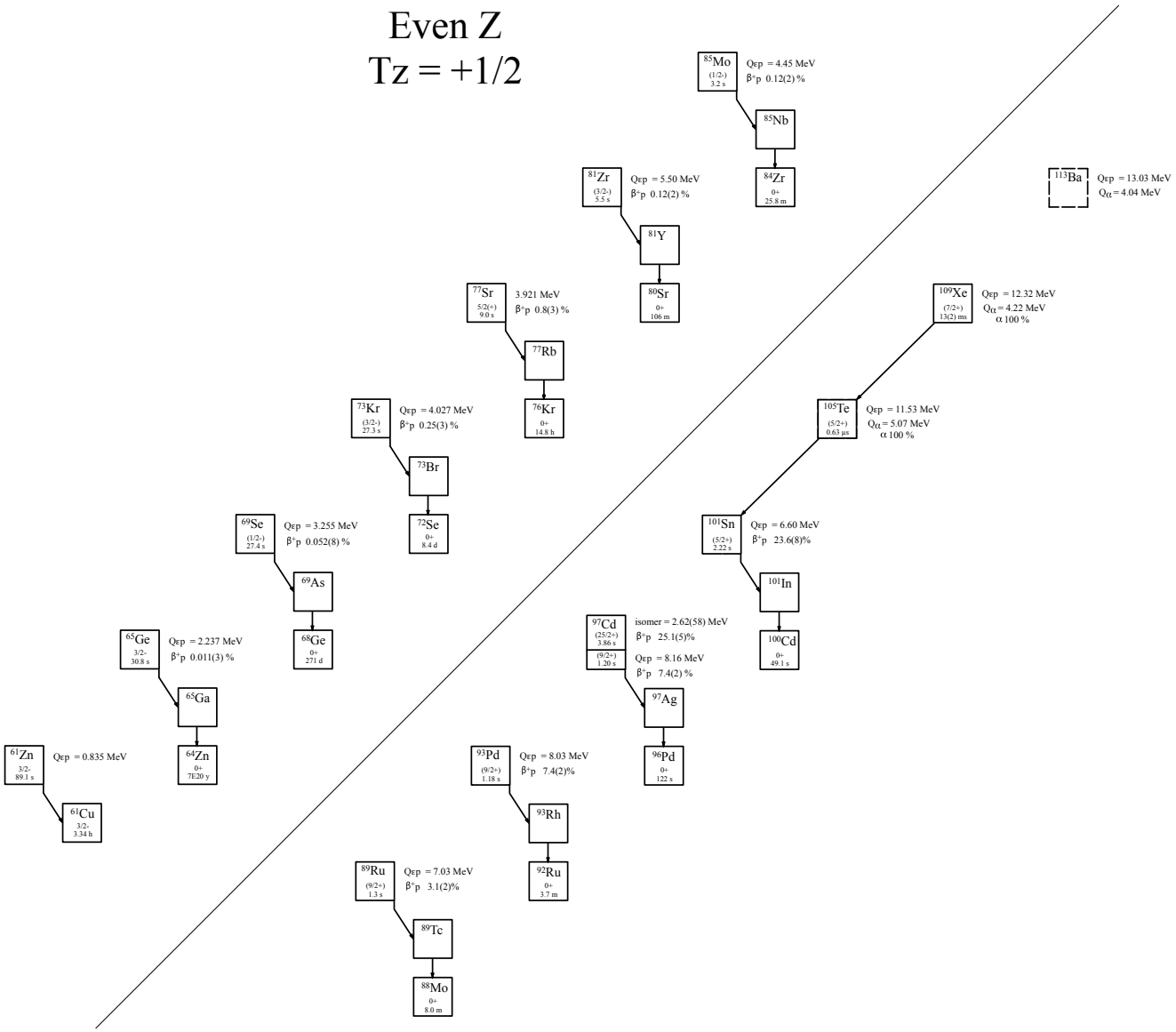

Fig. 1: Known experimental values for heavy particle emission of the even-Z T_z= +1/2 nuclei.

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Table 1
Observed and predicted β-delayed particle emission from the even-Z, T_z = +1/2 nuclei. Unless otherwise stated, all Q-values are taken from [2021Wa16] or deduced from values therein. The J^π value for ^{61}Zn is taken from ENSDF.

Nuclide	Ex	J^π	$T_{1/2}$	Q_ε	$Q_{\varepsilon p}$	$BR_{\beta p}$	$Q_{\varepsilon 2p}$	$Q_{\varepsilon\alpha}$	Experimental
^{61}Zn		$3/2^-$	89.1(2) s	5.635(16)	0.835(16)		-8.67(16)	0.572(16)	[**1972Du09**]
^{65}Ge		$3/2^-$	30.8(7) s	6.1793(23)	2.2368(23)	0.011(3)%	-5.476(2)	3.045(2)	[**1987Vi01**, 2000Gi11, 1976Ha29]
^{69}Se		$(1/2^-)$	27.4(2) s	6.680(30)	3.2551(24)	0.052(8)%	-4.134(2)	3.798(2)	[**2000Gi11**, 1988De28, 1977Ma24, 1976Ha22, 1976Ha29]
^{73}Kr		$(3/2^-)$	27.3(10) s	7.094(9)	4.027(7)	0.25(3)%	-3.237(8)	4.133(31)	[**2000Gi11**, 1999Mi17, 1981Ha44, 1972Ho20, 1976Ha29]
^{77}Sr		$5/2^{(+)}$	9.0(2) s	7.027(8)	3.921(9)	0.08(3)%	-3.274(9)	3.418(11)	[**2000Gi11**, 1976Ha29]
^{81}Zr		$(3/2^-)$	5.5(4) s	8.190(90)	5.500(90)	0.12(2)%	-1.295(90)	4.886(90)	[**1999Hu05**, 2005Xu04, 1997Hu15, 1977Ce05, 1976HaWO]
^{85}Mo		$(1/2^-)$	3.2(2) s	8.770(16)	6.623(17)	0.14(2)%	0.118(25)	5.778(17)	[**1999Hu05**, 2005Xu04, 1997Hu15, 1976HaWO]
^{89}Ru		$(9/2^+)$	1.31(3) s	9.025(25)	7.028(25)	3.1(2) %	0.927(25)	5.486(24)	[**2019Pa16, 2012Lo08**, 2005Xu04, 1999Li33]
^{93}Pd		$(9/2^+)$	1.18(2) s	10.03(37)	8.03(37)	7.4(2)%	2.43(37)	5.990(30)	[**2019Pa16**, 2012Lo08, 2005Xu04, 2001Xu05, 2000Sc31]
^{97}Cd		$(9/2^+)$	1.20(7) s	10.17(42)	8.16(42)	7.4(2)%	3.03(42)	5.87(42)	[**2019Pa16**, 2012Lo08, 1982Ku15]
^{97m}Cd	2.62(58)	$(25/2^+)$	3.86(6) s	12.79(72)	10.78(72)	25.1(5)%	5.65(72)	8.49(72)	[**2019Pa16**, 2012Lo08,2011Lo09]
^{101}Sn		$(5/2^+)$	2.22(5) s	8.24(30)	6.60(30)	23.6(8)%	1.82(30)	8.17(30)	[**2019Pa16, 2012Lo08**, 2020Pa25, 2007Ka15, 2007Se04, 1995Ja16]
^{105}Te		$(5/2^+)$	0.62(7) μs	11.20(30)	11.53(30)		7.24(30)	13.31(30)	[**2006Li41**, 2010Da17, 2019Xi06, 2007Li83, 2007LiZP, 2006Se08]
^{109}Xe		$(7/2^+)$	13(2) ms	11.50(30)	12.32(30)		9.91(30)	15.42(30)	[**2006Li41**, 2019Xi06, 2010Da17, 2007Li83, 2007LiZP, 2006Li41, 2006Se08]
^{113}Ba				12.06(30)#	13.03(30)#		10.67(30)#	15.54(30)#	

* Excitation Energy = 2.62(58) MeV [2019Pa16].

Table 2
Particle emission from the even-Z, T_z = +1/2 nuclei. Unless otherwise stated, all Q-values and separation energies are taken from [2021Wa16] or deduced from values therein.

Nuclide	S_p	S_{2p}	Q_α	BR_α	Experimental
^{61}Zn	5.293(16)	9.770(16)	-2.690(16)	——	
^{65}Ge	4.9344(26)	8.8427(27)	-2.554(16)	——	
^{69}Se	4.8292(24)	8.339(5)	-2.3814(26)	——	
^{73}Kr	4.779(7)	7.983(7)	-2.542(7)	——	
^{77}Sr	4.613(8)	8.058(11)	-3.677(10)	——	
^{81}Zr	3.670(90)	6.620(90)	-2.150(90)	——	
^{85}Mo	3.605(16)	6.176(17)	-2.140(90)	——	
^{89}Ru	3.988(25)	6.063(24)	-3.285(29)	——	
^{93}Pd	3.270(37)	5.32(37)	-3.04(37)	——	
^{97}Cd	3.51(43)	5.35(42)	-4.18(56)	——	
^{97m}Cd	0.89(72)	2.73(72)	-1.56(81)	——	
^{101}Sn	3.42(30)	4.95(30)	-2.00(52)	——	
^{105}Te	0.81(32)	0.30(32)	5.069(3)	100%	[**2010Da17**, 2019Xi06, 2006Li41, 2006Se08]
^{109}Xe	0.69(32)	0.09(32)	4.217(7)	100%	[**2010Da17**, 2019Xi06, 2006Li41, 2006Se08]
^{113}Ba	0.58(32)#	-0.23(32)#	4.04(42)#		

Table 3
β-p emission from ^{93}Pd*, $T_{1/2}$ = 1.18(2) s, $BR_{\beta p}$ = 7.4(2)%.

E_p	I_p(rel)%	I_p(abs)%	$E_{emitter}$ (^{93}Rh)	$E_{daughter}$(^{92}Ru)	coincident γ-rays
**	< 5.5	<0.3		2.672	0.817, 0.865, 0.990
**	14(3)	0.74(15)		1.855	0.865, 0.990
**	100(7)	5.3(4)		0.865	0.865
**	≈25(7)	≈1.3(4)		0.0	

* All values taken from [2019Pa16].

** Unresolved multiplet (Ep ≈ 1.5-5 MeV) - see Fig 8 in ref. [2019Pa16].

Table 4
β-p emission from ^{97}Cd*, $T_{1/2}$ = 1.20(7) s, $BR_{\beta p}$ = 7.4(2)%.

E_p	I_p(rel)%	I_p(abs)%	$E_{emitter}$ (^{97}Ag)	$E_{daughter}$(^{96}Pd)	coincident γ-rays
**	4.7(23)	0.16(7)		3.342	1.415, 1.972
**	19.6(52)	0.64(17)		2.391	0.192, 0.684, 1.415
**	100(23)	3.3(8)		2.099	0.684, 1.415
**	73(27)	2.4(9)		1.415	1.415
**	30(27)	1.0(9)		0.0	——

* All values taken from [2019Pa16].
** Unresolved multiplet (Ep ≈ 1.5-6 MeV) - see Fig 8 in ref. [2019Pa16].

Table 5
β-p emission from ^{97m}Cd*, Ex = 2.62(58) MeV, $T_{1/2}$ = 3.86(6) s, $BR_{\beta p}$ =25.1(5)%.

E_p	I_p(rel)%	I_p(abs)%	$E_{emitter}$ (^{97}Ag)	$E_{daughter}$(^{96}Pd)	coincident γ-rays
**	15.4(18)	2.16(25)		5.282	0.106, 0.423, 0.684, 1.253, 1.415, 1.499
**	58.4(13)	8.18(24)		4.574	0.106, 0.423, 0.684, 0.790, 1.253, 1.415
**	100(7)	14(1)		3.784	0.106, 0.423, 0.684, 1.253, 1.415

* All values taken from [2019Pa16].
** Unresolved multiplet (Ep ≈ 1.5-5 MeV) - see Fig 8 in ref. [2019Pa16].

Table 6
direct α emission from ^{105}Te*, J^π = 5/2$^+$, $T_{1/2}$ = 0.62(7) μs**, BR_α =100%.

E_α(c.m.)	E_α(lab)	I_α(rel)	I_α(abs)	J^π_f	$E_{daughter}$(^{101}Sn)	coincident γ-rays	R_0 (fm)	HF
4.898(3)	4.711(3)	100(4)%	89(4)%	5/2$^+$	0.172(2)	0.172	1.696(74)	3^{+5}_{-2}
5.073(20)	4.880(20)	12(4)%	11(4)%	7/2$^+$	0.0	——	1.696(74)	100^{+18}_{-7}

* All values from [2010Da17], except where noted
** [2006Li47]

Table 7
direct α emission from ^{109}Xe*, J^π = 5/2$^+$, $T_{1/2}$ = 13(2) ms**, BR_α =100%.

E_α(c.m.)	E_α(lab)	I_α(rel)	I_α(abs)	J^π_f	$E_{daughter}$(^{105}Te)	coincident γ-rays	R_0 (fm)	HF
4.059(10)	3.910(10)	45(8)%	31(7)%	7/2$^+$	0.150(3)	0.150	1.65(12)	3^{+12}_{-3}
4.218(4)	4.063(4)	100(10)%	69(7)%	5/2$^+$	0.0	——	1.65(12)	7^{+30}_{-6}

* All values from [2010Da17], except where noted.
** [2006Li41].

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