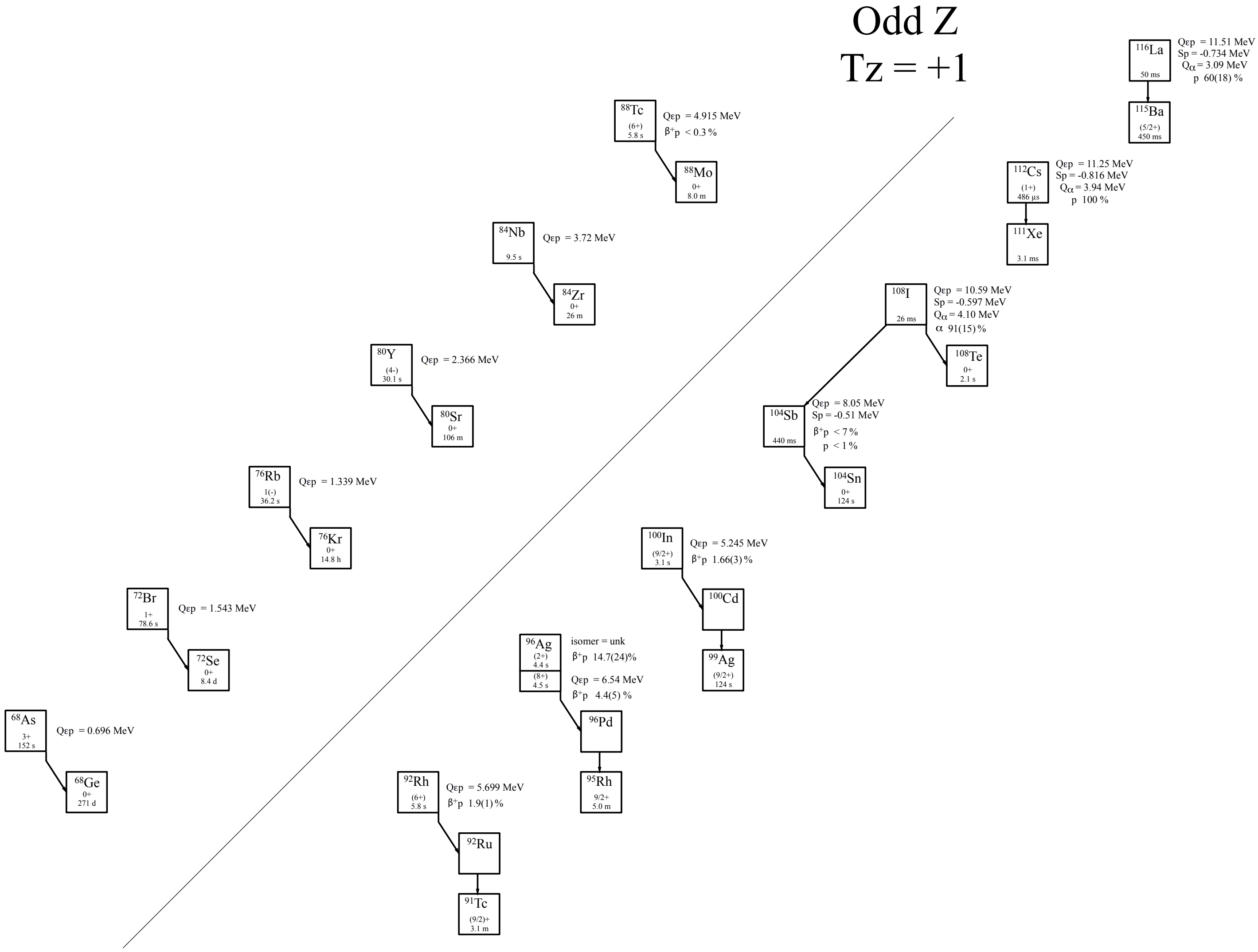

Fig. 1: Known experimental values for heavy particle emission of the odd-Z T_z= +1 nuclei.

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Table 1
Observed and predicted β-delayed particle emission from the odd-Z, T_z = +1 nuclei. Unless otherwise stated, all Q-values are taken from [2021Wa16] or deduced from values therein. J$^\pi$values for ^{68}As, ^{72}Br, ^{76}Rb, ^{80}Y, ^{84}Tc are taken from ENSDF.

Nuclide	Ex	J^π	$T_{1/2}$	Q$_\varepsilon$	$Q_{\varepsilon p}$	$BR_{\beta p}$	$Q_{\varepsilon 2p}$	$Q_{\varepsilon\alpha}$	Experimental
^{68}As		3^+	151.5(9) s	8.0843(26)	0.6957(22)		-4.5733(19)	4.685(2)	[**1977Pa13**]
^{72}Br		1^+	78.6(24) s	8.8064(22)	1.543(4)		-3.0778(13)	5.492(2)	[**1974Co14**]
^{76}Rb		$1^{(-)}$	36.2(2) s	8.535(4)	1.339(4)		-2.8439(9)	4.964(2)	[**1993Al03**]
^{80}Y		(4^-)	30.1(5) s	9.163(7)	2.366(7)		-1.548(6)	5.441(7)	[**1998Do04**]
^{84}Nb			9.5(10) s	10.228(6)	3.723(19)		0.238(6)	6.692(3)	[**2003Do01**]
^{88}Tc		(6^+)	5.8(4) s*	11.016(6)	4.915(8)	<0.3%*	1.721(6)	7.327(6)	[**2019Pa16**]
^{92}Rh		(6^+)	5.7(1) s	11.302(5)	5.699(5)	1.9(1)%	2.596(5)	7.263(6)	[**2019Pa16**, 2012Lo08, 2005Xu04, 2001Xu05]
^{96}Ag		(8^+)	4.46(4) s	11.670(90)	6.540(90)	4.4(5) %	3.496(90)	7.366(90)	[**2019Pa16**, 2012Lo08, 2003Ba39, 1997Sc30]
^{96m}Ag	x	(2^+)	4.395(85) s	11.67+x	6.540+x	14.7(24)%	3.496+x	7.366+x	[**2019Pa16**, 2012Lo08, 2003Ba39, 1997Sc30]
^{100}In		(6^+)	5.62(6) s	10.164(28)	5.245(7)	1.66(3)%	2.565(6)	9.580(5)	[**2019Pa16**, 2012Lo08, 2002Pl03, 1995Sz01]
^{104}Sb			440^{+150}_{-110} ms	12.33(10)#	8.05(10)#	<7%	5.78(10)#	12.47(10)#	[**1996FaZZ**, 2019Au02, 1995Le14, 1995Sc28]
^{108}I			26.4(8) ms	13.01(10)#	10.59(10)#		10.01(10)#	16.43(10)#	[**2019Pa16**, 1996IkZZ, 1994Pa11, 1991Pa05]
^{112}Cs		(1^+)	486(37) μs**	13.61(12)#	11.25(12)#		11.24(12)#	16.94(12)#	[**2012Ca03, 2012Wa10**, 1996IkZZ, 1994Pa12]
^{116}La			50(22) ms	13.48(20)#$^@$	11.51(20)#$^@$		11.61(20)#$^@$	16.75(20)#$^@$	[**2022Zh76**]

* Combined result for ground state and isomer.
** Weighted average of 506(55) μs [2012Wa10] and 470(50) μs [2012Ca03].
$^@$ Mass excess of ^{116}La is calculated to be -40897(200)# keV (-40050(320)# keV in [2021Wa16]) from the emitted proton energy and the mass excess for ^{115}Ba of -48920(200)# keV [2021Wa16]. This value is compared to the mass excess of the daughter from [2021Wa16] to deduce the value shown.

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

Nuclide	S$_p$	BR$_{1p}$	S$_{2p}$	Q$_\alpha$	BR$_\alpha$	Experimental
^{68}As	3.510(5)	—	9.7487(21)	-2.4866(23)	—	
^{72}Br	3.2042(30)	—	9.3057(17)	-2.5921(21)	—	
^{76}Rb	3.444(8)	—	9.769(6)	-3.8423(14)	—	
^{80}Y	2.957(10)	—	8.791(7)	-3.094(6)	—	
^{84}Nb	2.571(6)	—	7.708(6)	-2.471(6)	—	
^{88}Tc	2.074(5)	—	7.114(7)	-2.901(4)	—	
^{92}Rh	2.048(5)	—	6.852(4)	-3.754(6)	—	
^{96}Ag	1.83(9)	—	6.18(9)	-2.93(64)	—	
^{96m}Ag	1.83-x		6.18-x	-2.93+x	—	
^{100}In	1.5360(27)	—	5.690(30)	-2.090(90)	—	
^{104}Sb	-0.510(20	<1%	3.18(10)#	2.46(10)#		[**2019Au02**]
^{108}I	-0.597(13)	<1%	0.88(10)#	4.099(5)	100%	[**2019Au02**, 1994Pa11]
^{112}Cs	-0.816(4)	100%	0.53(13)#	3.940(20)**		[**2012Ca03, 2012Wa10**, 1996IkZZ, 1994Pa12]
^{116}La	-0.734(9)**	60(18)%	0.79(20)#$^@$	3.09(20)#$^@$		[**2022Zh76**]

* [2019Au02]
** From [2022Zh76], -1.58(38)# in [2021Wa16].
$^@$ Mass excess of ^{116}La is calculated to be -40897(200)# keV (-40050(320)# keV in [2021Wa16]) from the emitted proton energy and the mass excess for ^{115}Ba of -48920(200)# keV [2021Wa16]. This value is compared to the mass excess of the daughter from [2021Wa16] to deduce the value shown.

Table 3
direct α emission from ^{108}I*, J^{π} = , $T_{1/2}$= 26.4(8) ms, BR_{α} = 99.50(21)%.

E_{α}(c.m.)	E_{α}(lab)	I_{α}(abs)	J^{π}_{f}	$E_{daughter}$(^{105}Te)	coincident γ-rays
4.097(10)	3.945(10)	99.50(21)%		0.0	—

* All values from [2019Au02].

Table 4
direct proton emission from ^{108}I*, J^{π} = , BR_{p} =0.50(21)%.

E_{p}(c.m.)	E_{p}(lab)	I_{p}(absb)	J^{π}_{f}	$E_{daughter}$(^{111}Xe)	coincident γ-rays
0.597(13)	0.591(13)	0.50(21)%	(5/2^{+})	0.0	—

* All values from [2019Au02].

Table 5
direct proton emission from ^{112}Cs*, J^{π} = $T_{1/2}$ = 486(37) μs**, BR_{p} =100%.

E_{p}(c.m.)	E_{p}(lab)	I_{p}(rel)	I_{p}(abs)	J^{π}_{f}	$E_{daughter}$(^{111}Xe)	coincident γ-rays
0.716(20)	0.710(20)	≈ 10%	≈ 9%			
0.817(5)	0.810(5)	100%	≈91%		0.0	—

* All values from [2012Wa10], except where noted.
** Weighted average of 506(55) μs [2012Wa10] and 470(50) μs [2012Ca03].

Table 6
direct proton emission from ^{116}La*, J^{π} = $T_{1/2}$ = 50(22) ms, BR_{p} = 60(18)%.

E_{p}(c.m.)	E_{p}(lab)	I_{p}(abs)	J^{π}_{f}	$E_{daughter}$(^{115}Ba)	coincident γ-rays
0.734(9)	0.718(9)	60(18)%	(5/2^{+})	0.0	—

* All values from [2022Zh76].

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