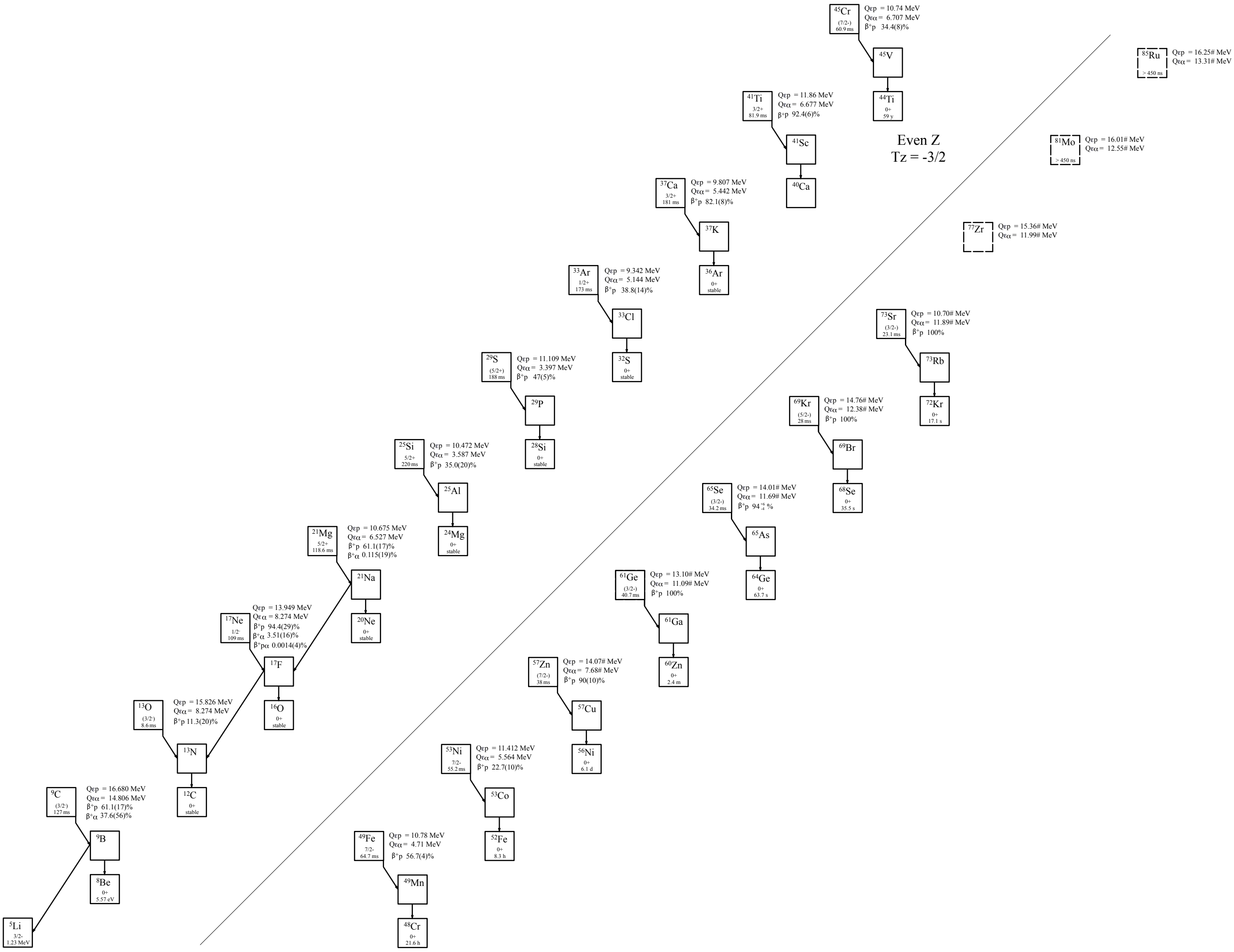

Fig. 1: Known experimental values for heavy particle emission of the even-Z T_z= -3/2 nuclei.

Last updated 7/27/23

Table 1
Observed and predicted β-delayed particle emission from the even-Z, T_z = -3/2 nuclei. Unless otherwise stated, all Q-values are taken from [2021Wa16] or deduced from values therein.

Nuclide	J^π	$T_{1/2}$	Q_ε	$Q_{\varepsilon p}$	$BR_{\beta p}$	$Q_{\varepsilon 2p}$	$Q_{\varepsilon 3p}$	$Q_{\varepsilon\alpha}$	$BR_{\beta\alpha}$	Experimental
^{9}C	(3/2$^-$)	126.5(9) ms	16.495(23)	16.680(2)	61.1(17)%*	-0.574(2)	-10.548(2)	14.806(50)	37.6(56)%**	[**2001Be51, 2001Bu05, 1972Es05**, 2004Ti06, 2000Ge09, 1988Mi03, 1972Es05, 1971EsZR, 1971EsZW, 1965Ha09]
^{13}O	(3/2$^-$)	8.58(5) ms	17.770(10)	15.826(10)	11.3(20)%	-0.131(10)	-11.360(10)	8.274(10)	0.078(6)%***	[**2023Bi03, 2005Kn02, 1990As01**, 1971EsZR, 1970Es03, 1966Ce02, 1965Mc09, 1963Ba63]
^{17}Ne	1/2$^-$	109.3(6) ms	14.5488(4)	13.9485(4)	94.4(29)%	1.8211(4)	-8.3865(4)	8.7300(5)	3.51(16)%@	[**2002Mo19, 1988Bo39**, 2002Ch61, 1971EsZR, 1971Ha05, 1967Es02, 1966Es04, 1965Ha20, 1964Da13, 1964Fl03, 1964Mc16, 1963Ba63, 1963Ka36]
^{21}Mg	5/2$^+$	118.6(5) ms	13.0887(8)	10.657(1)	20.9(13)%	-2.187(1)	-10.180(1)	6.527(1)	0.115(19)%@@	[**2015Lu12**, 2015Lu13, 1992Go10, 1985Zh05, 1974ScZL, 1973Go06, 1973GoZL, 1973Se08, 1973SeYM, 1965Ha20, 1965Mc01, 1964Fl03, 1963Ba63, 1963Ka36]
^{25}Si	5/2$^+$	220(4) ms	12.743(10)	10.472(10)	35.0(20)%	-1.221(10)	-10.015(10)	3.587(10)		[**2021Su03**, 2004Th09, 1993Ro06, 1992Ha28, 1985Zh05, 1975ScZC, 1974SeZL, 1974SeZM, 1973GoZL, 1973SeYM, 1966Ha22, 1966Re07, 1966Re15, 1965Ha20, 1965Mc01 1963Ba63, 1963Mc08]
^{29}S	(5/2$^+$)	187(6) ms	13.858(13)	11.109(13)	47(5)%	-0.475(13)	-8.747(13)	3.397(13)		[**1985Zh05, 1979Vi01**, 1978ViZT, 1978ViZT, 1973Go06, 1973GoZL 1964Ha45, 1967Fi10]
^{33}Ar	1/2$^+$	173.0(20) ms	11.6190(6)	9.3423(4)	38.8(14)%	0.4782(4)	-6.8183(4)	5.1435(6)		[**2010Ad03**, 2014Ko17, 2002Fy01, 2000Ga61, 1999Th09, 1996Ho24, 1993Sc16, 1987Bo21, 1971EsZR, 1971Ha05, 1966Po12, 1965Ha08, 1964Re08]
^{37}Ca	3/2$^+$	181.1(10) ms	11.6641(6)	9.8065(6)	82.1(8)%	1.299(1)	-5071(1)	5.442(1)		[**1997Tr05, 1991Ga23**, 2015Su01, 1997Ka10, 1995Tr03, 1974Se11, 1966Po12, 1964Ha42, 1964Re08]
^{41}Ti	3/2$^+$	81.9(5) ms	12.945(28)	11.860(28)	92.4(6)%@@@	3.531(28)	-2.850(28)	6.677(28)		[**2015Sh16, 2007Do17,1998Bh12, 1998Li46, 1974Se11, 1997Tr11**, 2014Ka01, 1997Ho12, 1998Jo20, 1985Zh05, 1973Go06, 1966Po12, 1964Re08]
^{45}Cr	(7/2$^-$)	60.9(4) ms	12.370(40)	10.74(4)	34.4(8)%	2.100(40)	-2.830(40)	6.707(40)		[**2007Do17**, 1987Ki14, 1974Ja10]
^{49}Fe	7/2$^-$	64.7(3) ms	12.869(24)	10.782(25)	56.7(4)%	2.678(24)	-2.490(24)	4.710(24)		[**2007Do17**, 2002Pf03, 1996Fa09, 1970Ce02]
^{53}Ni	7/2$^-$	55.2(7) ms	13.029(25)	11.412(13)	22.7(10)%[a]	4.0354(25)#	-1.237(25)	5.564(25)		[**2016Su10, 2007Do17**, 2013Su07, 1993Xu04, 1978ViZT]
^{57}Zn	(7/2$^-$)	43.6(2) ms	14.76(20)#	14.07(20)#	90(10)%	6.90(20)#	1.84(20)#	7.68(20)#		[**2022Sa20, 2020Ci04, 2007Bl09, 2002Jo09** 2002Lo13, 1979Vi01]
^{61}Ge	(3/2$^-$)	40.7(4) ms	13.35(30)#	13.10(30)#	78(3)%	7.99(30)#	4.57(30)#	11.09(30)#		[**2017GoZT, 2007Bl09**, 2002Lo13, 1987Ho01, 1978ViZT]
^{65}Se	(3/2$^-$)	34.2(2) ms	13.92(31)#	14.01(30)#	94^{+6}_{-4}%	8.95(30)#	6.28(30)#	11.69(30)#		[**2017GoZT, 2011Ro47**, 1993Ba12, 1978ViZT]
^{69}Kr	(5/2$^-$)	28(1) ms	14.12(30)#	14.76(30)#	100%[b]	9.87(30)#	7.60(30)#	12.38(30)#		[**2011Ro47, 2014De41**, 2017GoZT]
^{73}Sr	(3/2$^-$)	23.1(14) ms	14.06(40)#	14.70(40)#	100%[c]	9.97(40)#	8.11(40)#	11.89(40)#		[**2019Si33, 2020Ho17**, 2020Ho06, 1993Ba61]
^{77}Zr			14.84(45)#	15.36(40)#		11.04(40)#	8.87(40)#	11.99(40)#		
^{81}Mo		>450 ns	14.90(64)#	16.01(58)#		11.76(51)#	9.85(50)#	12.55(54)#		[**2017Su26**]
^{85}Ru		>450 ns	15.22(64)#	16.25(58)#		12.40(53)#	11.12(50)#	13.31(64)#		[**2017Su26**]

* Branching ratio is taken from [2001Bu05], normalized to the 54.1(15)% proton transition from the ground state of ^{9}B from Ref. [2001Be51]. The β-delayed p emission from ^{9}C ends in ^{8}Be which then decays into 2 α particles. Therefore this decay can be called β-p2α emission.

** The β-delayed α emission from ^{9}C ends in ^{5}Li which is proton unbound. Therefore this decay can be called β-αp emission.

*** [2023Bi03] report a value of 0.078(6)% for β-delayed 3αp decay. This value is a combination of both $^{13}\mathrm{O}\xrightarrow{\beta}{}^{13}\mathrm{N}\xrightarrow{p}{}^{12}\mathrm{C}\xrightarrow{\alpha}{}^{8}\mathrm{Be}\xrightarrow{2\alpha}$ and $^{13}\mathrm{O}\xrightarrow{\beta}{}^{13}\mathrm{N}\xrightarrow{\alpha}$-$^{9}\mathrm{B}\xrightarrow{p}{}^{8}\mathrm{Be}\xrightarrow{2\alpha}$.

@ In addition a $BR_{\beta p\alpha}$ = 0.0014(4)% is reported [2002Mo19].

@@ In addition a $BR_{\beta p\alpha}$ = 0.016(3)% is reported [2015Lu12].

@@@ Weighted average of 91.6(6)% [2007Do17], 95.3(23)% [1998Bh12], and 100.3(22)% [1997Tr11].

[a] Weighted average of 23.4(10)% [2007Do17] and 22.0(10)% [2016Su10].

[b] Expected to be 100% as the daughter ^{69}Br is unbound by 640(40) keV [2017Wa10].

[c] Expected to be 100% as the daughter ^{73}Rb is unbound by 570(20) keV [2017Wa10].

Table 2

Particle emission from the even-Z, T_z = -3/2 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	Experimental
^{9}C	1.2996(24)	1.436(2)	-10.65(200)#	
^{13}O	1.512(10)	2.112(10)	-8.220(10)	
^{17}Ne	1.464(5)	0.933(1)	-9.040(10)	
^{21}Mg	3.2356(13)	5.4261(8)	-8.0215(8)	
^{25}Si	3.413(10)	5.277(10)	-9.501(19)	
^{29}S	3.236(13)	5.288(13)	-9.347(16)	
^{33}Ar	3.3386(7)	4.9197(5)	-8.715(13)	
^{37}Ca	3.0079(7)	4.667(1)	-6.177(1)	
^{41}Ti	2.463(28)	2.993(28)	-4.986(28)	
^{45}Cr	3.000(40)	4.780(40)	-6.240(50)	
^{49}Fe	2.743(25)	4.766(25)	-7.660(40)	
^{53}Ni	2.576(26)	4.020(25)	-7.310(30)	
^{57}Zn	1.21(20)#	1.79(20)#	-5.34(20)#	
^{61}Ge	1.49(36)#	1.15(30)#	-3.67(36)#	
^{65}Se	0.78(36)#	0.68(30)#	-1.66(42)#	
^{69}Kr	0.64(40)#	0.14(31)#	-1.55(42)#	
^{73}Sr	0.91(64)#	0.20(42)#	-2.24(50)#	
^{77}Zr	0.64(50)#	-0.44(46)#	-2.08(57)#	
^{81}Mo	0.33(64)#	-0.73(58)#	-2.29(64)#	
^{85}Ru	0.22(64)#	-1.13(64)#	-1.60(71)#	

Table 3

β-p Emission from ^{9}C, $T_{1/2}$=126.5(9) ms@@, $BR_{\beta p}$ = 61.1(17)%**

E_p*	I_p(rel)	I_p(abs)**	$E_{emitter}$ (^{9}B)***	$E_{daughter}$(^{8}Be)***	coincident γ-rays
0.1858(9)	100	58(11)	0	0	100% α
2.529(30)	0.23(3)	0.136(14)	2.34(3)	0	100% α
3.113(20)	0.18(1)	0.112(6)	2.93(20)	0	100% α
3.25(30)	8.6(9)	5.0(5)	3.10(30)	0	100% α
5.4(14)	1.2(6)	0.72(36)	$5.3^{+1.4}_{-0.5}$	0	100% α
9.32(40)	2.1(7)	1.2(4)	$12.16^{+0.03}_{-0.4}$	3.03	100% α
12.35(40)	0.084(19)	0.049(6)	$12.16^{+0.03}_{-0.4}$	0	100% α
13.526(20)	1.7(9)x 10^{-5}	9.3(5)x 10^{-6}	13.34(20)	0	100% α
14.22(10)	0.069(7)	0.07(2)	14.03(10)	0	100% α
@	0.38(20)	0.22(12)			100% α

* E_p values calculated from E_{level} (emitter) [2001Bu05] and S_p = -0.1858(9) MeV [2021HWa16].

** Branching ratio is taken from [2001Bu05], normalized to the 54.1(15)% proton transition from the ground state of ^{9}B from Ref. [2001Be51].

*** From (table 3 and figure 7) in [2001Bu05].

@ Background states [2001Be51].

@@ [1972Es05]

Table 4
β-α emission from ^{9}C, $BR_{\beta\alpha}$ = 37.6(56)%**

E_α*	I_α (rel)	I_α (abs)***	$E_{emitter}$ (^{9}B)***	$E_{daughter}$(^{5}Li)	coincident γ-rays
0.653(58)	100(19)	29.3(56)	2.34(3)	0	100% proton
1.237(53)	0.61(33)	0.18(9)	2.93(20)	0	100% proton
1.37(30)	0.11(3)	0.031(4)	3.1(3)	0	100% proton
$3.6^{+1.4}_{-0.5}$	1.7(9)	0.49(25)	$5.3^{+1.4}_{-0.5}$	0	100% proton
10.47(40)	12.0(10)	3.5(3)	12.16(40)	0	100% proton
12.34(11)	0.61(33)	0.18(9)	14.03(10)	0	100% proton
10.58@	0.18(12)	0.06(4)@	12.16(40)	1.49@	100% proton
#	0.105(5)	0.035(2)			100% proton

* E_α values deduced from $E_{emitter}$ (^{9}B) [2001Bu05] and Q_α = -1.690(50) MeV [2021Wa16].
** Branching ratio is taken from [2001Bu05], normalized to the 54.1(15)% proton transition from the ground state of ^{9}B from Ref. [2001Be51].
*** From (table 3 and figure 7) in [2001Bu05] unless otherwise stated.
# Background states [2001Be51].
@ From [2001Be51].

Table 5
β-p emission from ^{13}O*, $T_{1/2}$= 8.58(5) ms@, $BR_{\beta p}$ = 10.9(20)%.

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{13}N)	$E_{daughter}$(^{12}C)**	coincident γ-rays**
1.006(6)	2.4(3)	0.23(5)	7.376(9)***	4.4389(3)	4.438
1.5597(10)	100	9.5	3.502(2)***	0	——
2.591(6)	4.5(3)	0.43(8)	8.918(11)***	4.4389(3)	4.438
3.175(6)	1.06(11)	0.10(2)	9.476(8)***	4.4389(3)	4.438
5.445(6)	0.09(4)	0.009(4)	7.376(9)***	0	——
7.030(6)	5.3(4)	0.50(10)	8.918(11)***	0	——
7.396(53)	0.011(2)	0.0010(3)	15.300(200)	7.6542(2)	3.215, 4.438
7.614(6)	1.40(13)	0.13(3)	9.476(8)***	0	——
8.714(53)	0.030(5)	0.003(1)	15.0646(4)***	4.4389(3)	4.438
9.78(6)	0.15(4)	0.040(14)	11.700(30)***	0	——
11.32(9)	0.11(9)	0.010(9)	13.26(10)	0	——
13.152(53)	0.049(7)	0.005(1)	15.0646(4)***	0	——
13.5(4)	0.04(3)	0.004(3)	15.300(200)	0	——

* All values taken from [2005Kn02], except where noted.
** Values from adopted levels in ENSDF [2017Ke05].
*** Values from adopted levels in ENSDF [1991Aj01].
@ [1990As01]

Table 6
β-p Emission from ^{17}Ne*, $T_{1/2}$ = 109.3(5) ms$^{@}$, $BR_{\beta p}$ = 94.4(29)%

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{17}F)***	$E_{daughter}$(^{16}O)$^{@@}$	coincident γ-rays$^{@}$
0.358	<0.10	<0.049	8.075	7.1169(1)	7.115
0.47	0.066(59)	0.033(29)	10.655	9.585(11)	9.582, 6.916, 2.688
0.48	3.06(24)	1.51(9)	8.197	7.1169(1)	7.115
0.557	< 0.12	<0.058	8.074	6.9171(6)	6.916
0.560	<0.0037	<0.0018	10.032	8.8719(5)	2.742, 6.129, 1.755, 7.115
0.680	3.61(27)	1.78(13)	8.197	6.9171(6)	6.916
0.719	1.28(6)	0.63(3)	8.436	7.1169(1)	7.115
0.720	$< 2.8 \times 10^{-6}$	$< 1.4 \times 10^{-6}$	10.905	9.585(11)	9.582, 6.916, 2.688
0.918	1.28(6)	0.63(3)	8.435	6.9171(6)	6.916
1.002	0.029(8)	0.014(4)	11.187	9.585(11)	9.582, 6.916, 2.688
1.108	2.53(10)	1.25(5)	8.825	7.1169(1)	7.115
1.19	< 0.020	< 0.02	10.662	8.8719(5)	2.742, 6.129, 1.755, 7.115
1.307	2.47(11)	1.22(5)	8.824	6.9171(6)	6.916
1.344	0.16(15)	0.080(7)	8.075	6.129(89)	6.129
1.425	0.91(6)	0.45(3)	8.075	6.0494(1)	**
1.44	$< 3.1 \times 10^{-4}$	<0.00015	10.912	8.8719(5)	2.742, 6.129, 1.755, 7.115
1.47	0.97(23)	0.48(12)	8.200	6.129(89)	6.129
1.55	$< 3.3 \times 10^{-5}$	$< 1.6 \times 10^{-5}$	8.200	6.0494(1)	**
1.706	4.83(17)	2.38(8)	8.436	6.1299	6.129
1.721	0.24(4)	0.12(2)	11.193	8.8719(5)	2.742, 6.129, 1.755, 7.115
1.73	0.62(4)	0.31(2)	9.447	7.1169(1)	7.115
1.786	0.70(3)	0.35(2)	8.436	6.0494(1)	**
1.93	1.83(7)	0.90(4)	9.447	6.9171(6)	6.916
2.095	0.16(2)	0.08(1)	8.825	6.1299	6.129
2.175	3.45(20)	1.7(1)	8.825	6.0494(1)	**
2.313	< 0.026	<0.013	10.027	7.1169(1)	7.115
2.504	0.31(3)	0.15(2)	3.104	0	
2.51	0.22(2)	0.11(1)	10.030	6.9171(6)	6.916
2.72	0.295(20)	0.15(1)	9.450	6.1299	6.129
2.8	0.93(5)	0.46(3)	9.450	6.0494(1)	**
2.94	< 0.011	<0.006	10.657	7.1169(1)	7.115
3.14	< 0.015	<0.008	10.657	6.9171(6)	6.916
3.19	0.23(2)	0.112(8)	10.907	7.1169(1)	7.115
3.3	0.034(10)	0.017(5)	10.030	6.1299	6.129
3.38	0.90(5)	0.45(3)	10.030	6.0494(1)	**
3.39	0.12(2)	0.057(9)	10.907	6.9171(6)	6.916
3.476	0.37	0.18	11.193	7.1169(1)	7.115
3.676	0.009(3)	0.004(1)	11.193	6.9171(6)	6.916
3.93	< 0.07	<0.035	10.660	6.1299	6.129
4.01	1.20(7)	0.59(4)	10.660	6.0494(1)	**
4.04	28.6(6)	14.1(8)	4.640	0	
4.18	< 0.07	<0.035	10.910	6.1299	6.129
4.26	1.20(7)	0.59(3)	10.910	6.0494(1)	**
4.463	0.50(2)	0.245(10)	11.193	6.1299	6.129
4.543	0.090(7)	0.045(3)	11.193	6.0494(1)	**
4.888	100(5)	49.4(27)	5.488	0	——
5.437	15.1(8)	7.5(4)	6.037	0	——
7.475	9.7(5)	4.8(3)	8.075	0	——
7.6	0.39(3)	0.19(1)	8.200	0	——
7.836	1.25(7)	0.62(4)	8.436	0	——
8.225	0.81(5)	0.40(2)	8.825	0	——
8.85	0.043(4)	0.022(2)	9.450	0	——
9.43	0.043(4)	0.021(2)	10.030	0	——
10.06	0.004(2)	0.0021(2)	10.660	0	——
10.31	0.028(4)	0.014(2)	10.910	0	——
10.5924	0.13(1)	0.063(4)	11.193	0	——
11.65	0.004(2)	0.0021(8)	12.250	0	——

* All values taken from [2002Mo19], error bars for energies are not given.
** E0 transition
*** Calculated from alpha energies and S_p (^{17}F) = 600.27(25) keV [2021Wa16].
@ [1988Bo39]
@@ Values from adopted levels in ENSDF [1993Ti07].

Table 7
β-α emission from ^{17}Ne*, $BR_{\beta\alpha}$ = 3.51(16)%.

E_α	I_α (rel)	I_α (abs)	$E_{emitter}$ (^{17}F)***	$E_{daughter}$(^{13}N)[@]	coincident γ-rays
1.827	0.08(4)**	0.002(1)**	11.193	3.547(4)	3.547
1.872			11.193	3.502(2)	3.502
2.256	100(6)	2.7(2)	8.075	0	
2.381	10.3(8)	0.28(2)	8.2	0	
2.617	4.4(3)	0.12(1)	8.436	0	
3.006	8.5(6)	0.23(2)	8.825	0	
3.63	2.7(2)	0.074(5)	9.45	0	
4.21	2.4(2)	0.065(5)	10.03	0	
4.84	0.031(28)	0.00085(76)	10.66	0	
5.09	0.55(7)	0.025(2)	10.91	0	
5.374	0.12(3)	0.003(1)	11.193	0	

* All values taken from [2002Mo19], error bars for energies are not given.
** Sum of I_α for E_α = 1.827 and 1.872.
*** Calculated from proton energies and S_α (^{17}F) = 5818.7(4) keV [2021Wa16].
[@] Values from adopted levels in ENSDF [1991Aj01]

Table 8
β-αp emission from ^{17}Ne*, $Q_{\varepsilon\alpha p}$ = 6.787(1) MeV, $BR_{\beta\alpha p}$ = 0.0014(4)%.

E_α	$E_{\alpha-emitter}$(^{17}F)	E_p	$E_{p-emitter}$(^{13}N)	E_{final}(^{12}C)	coincident γ-rays
3.0089	11.193	0.422	2.365	0	——

* All values taken from [2002Mo19], uncertainties for energies are not given.

Table 9
β-p emission from ^{21}Mg*, $T_{1/2}$ = 118.6(5) ms, $BR_{\beta p}$ = 20.9(13)%.

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{21}Na)***	$E_{daughter}$(^{20}Ne)[@]	coincident γ-rays[@]
0.396(10)	3.91(45)	0.22(3)	4.468(10)	1.6337	1.634
0.906(10)	2.0(5)	0.11(3)	8.303(10)	4.9665(2)	1.634, 3.333
0.919(21)	0.28(3)	0.016(2)	8.975(10)[a]	5.6214(17)	1.634, 3.987
0.937(10)	19.4(5)	1.10(3)	7.609(10)	4.2477(11)	1.634, 2.614
1.102(10)	3.34(6)	0.19(3)	3.544(10)	0	——
1.316(10)	20.01(15)	1.13(1)	5.380(10)	1.6337	1.634
1.427(10)	2.84(11)	0.16(1)	8.135(10)	4.2477(11)	1.634, 2.614
1.564(10)	4.66(9)	0.26(1)	8.975(10)[a]	4.9665(2)	1.634, 3.333
1.630(10)	2.95(17)	0.17(1)	8.303(10)	4.2477(11)	1.634, 2.614
1.861(10)	44.05(24)	2.50(2)	4.294(10)	0	——
2.037(10)	100.0(4)	5.66(2)	4.468(10)	0	——
2.144(10)	4.58(14)	0.26(1)	6.165(10)	1.6337	1.634
2.263(11)	3.79(55)	0.22(3)	6.341(11)	1.6337	1.634
2.302(10)	0.73(20)	0.04(1)	8.975(10)[a]	4.247(11)	1.634, 2.614
2.587(10)	20.89(24)	1.18(2)	5.020(10)	0	——
3.443(10)	34.6(31)	1.96(18)	5.884(10)	0	——
3.585(11)	8.0(15)	0.45(9)	7.609(11)	1.6337	1.634
4.055(10)	33.58(2.45)	1.90(14)	6.468(10)	0	——
4.257(10)	1.99(20)	0.11(1)	8.303(10)	1.6337	1.634
4.356(10)	1.94(19)	0.11(1)	8.397(10)	1.6337	1.634
4.769(10)	10.9(8)	0.62(5)	8.827(10)	1.6337	1.634
4.913(10)	24.29(176)	1.4(1)	8.975(10)[a]	1.6337	1.634
5.171(12)	5.63(75)	0.32(4)	7.609(12)	0	——
5.868(10)	1.56(18)	0.09(1)	8.303(10)	0	——
5.983(10)	1.37(13)	0.078(7)	8.397(10)	0	——
6.388(11)	2.86(29)	0.16(2)	8.827(11)	0	——
6.537(10)	8.85(65)	0.50(4)	8.975(10)[a]	0	——
7.20(30)	0.05(2)	0.003(1)	9.725(30)	0	——

* All values are taken from [2015Lu12], except where noted.
*** Energy levels from 2015Lu12 based on proton energies and known resonances in ^{20}Ne [1981Fe05, 1969Bl03, 1964Va10, 2004Fi10].
[@] Values from adopted levels in ENSDF [1998Ti06].
[a] IAS [2015Lu12].

Table 10
β-α emission from ^{21}Mg*, $BR_{\beta\alpha}$ = 0.115(19)%.

E_α	I_α (rel)	I_α (abs)	$E_{emitter}$ (^{21}Na)	$E_{daughter}$(^{17}F)	coincident γ-rays
2.201(27)	0.11(1)	0.0062(5)	8.827(27)	0	——
2.397(10)	1.79(5)	0.100(3)	8.975(10)	0	——
2.700(43)	0.10(1)	0.0056(6)	9.725(30)	0.495	0.495
3.060(81)	0.04(1)	0.0022(6)	9.725(30)	0	——

* Values are taken from [2015Lu12].

Table 11
β-$p\alpha$ emission from ^{21}Mg*, $Q_{\varepsilon p\alpha}$ = 5.927(1) MeV, $BR_{\beta p\alpha}$ = 0.016(3)%.

E_p (c.m.)	$E_{p-emitter}$ (^{21}Na)	E_α(c.m.)	$E_{\alpha-emitter}$ (^{20}Ne)	E_{final}(^{16}O)	coincident γ-rays
0.921(21)	8.975(10)	0.882(18)	8.054(18)	0	

* Values are taken from [2015Lu12].

Table 12
β-p emission from ^{25}Si*, $T_{1/2}$ = 220(4) ms[@], $BR_{\beta p}$ = 35.0(20)%

E_p	I_p(rel)%[b]	I_p(abs)%	$E_{emitter}$ (^{25}Al)**	$E_{daughter}$(^{24}Mg)***	coincident γ-rays**
0.4020(9)	59(17)	6.1(15)	2.6733(6)	0	——
0.554(10)	4.8(25)	0.49(25)	4.192(4)	1.369	1.369
0.724(4)	0.3(15)	0.036(15)	7.240(3)	4.238	1.369, 2.870, 4.238
0.9437(11)	17(5)	1.7(5)	4.582(2)	1.369	1.369
1.037(16)	1.6(6)	0.16(6)	7.422(5)	4.123	1.369, 2.754
1.268(5)	4.0(22)	0.41(22)	4.906(4)	1.369	1.369
1.380(5)	3.7(14)	0.38(14)	7.901(2)	4.238	1.369, 2.870, 4.238
1.492(6)	2.5(13)	0.26(13)	7.901(2)	4.123	1.369, 2.754
1.584(3)	2.9(16)	0.30(16)	3.8591(8)	0	——
1.684(12)	1.7(10)	0.18(10)	8186(3)	4.238	1.369, 2.870, 4.238
1.794(3)	5.0(20)	0.51(19)	8.186(3)	4.123	1.369, 2.754
1.9243(20)	25(8)	2.6(7)	4.192(4)	0	——
2.164(3)	17(5)	1.7(4)	5804(4)	1.369	1.369
2.3100(9)	15(4)	1.5(3)	4.582(2)	0	——
2.453(25)	0.40(12)	0.040(11)	6063(7)	1.369	1.369
2.486(25)	1.0(3)	0.10(3)	6.170(2)	1.369	1.369
2.632(10)	0.50(12)	0.048(10)	4.906(4)	0	
3.006(11)	4.1(25)	0.42(25)	6.650(5)	1.369	1.369
3.236(6)	4.1(16)	0.42(16)	6.877(7)	1.389	1.369
3.327(4)	5(3)	0.5(3)	5.597(6)	0	——
3.464(3)	35(15)	3.6(15)	7.118(5)	1.369	1.369
3.606(4)	10(5)	1.0(5)	7.240(3)	1.369	1.369
3.896(8)	2.9(10)	0.3(1)	6.170(2)	0	——
4.257(3)	100(14)	10.3(14)	7.901(2)	1.369	1.369
4.345(17)	4.4(16)	0.45(15)	7.936(20)	1.369	1.369
4.551(5)	2.9(10)	0.3(1)	8.186(3)	1.369	1.369
4.614(9)	0.30(12)	0.035(11)	6.909(10)	0	——
4.614(9)	0.30(12)	0.035(11)	6.909(10)	0	——
4.845(4)	11(8)	1.1(8)	7.118(5)	0	——
4.980(4)	2.7(23)	0.28(23)	7.240(3)	0	——
5.382(11)	2.2(14)	0.23(14)	7.646	0	——
5.549(15)	3.1(10)	0.32(9)	7.819(20)	0	——
5.6288(15)	21(7)	2.2(6)	7.901(2)	0	——
6.798(5)	1.3(10)	0.13(10)	9.073(7)	0	——
7.000(25)	0.10(2)	0.0127(17)	9.275(25)[@@]	0	——
7.141(30)	0.10(2)	0.0127(17)	9.415(30)[@@]	0	——

* average of all data from [2021Su03], [1993Ro06], [1992Ha28], [1985Zh05], taken from table 3 of [2021Su03],
** Values from adopted levels in ENSDF [2009Fi05] except where noted.
*** Values from adopted levels in ENSDF [2007Fi14].
[@] Weighted average of 225(6) ms [1965Mc01] and 218(4) ms [1966Re07].
[@@] [1985Zh05].

Table 13
β-p emission from ^{29}S*, $T_{1/2}$ = 187(6) ms, $BR_{\beta p}$ = 47(5)%.

E_p(c.m.)	I_p(rel)%	I_p(abs)%@@	$E_{emitter}$ (^{29}P)	$E_{daughter}$(^{28}Si)**	coincident γ-rays**
0.766@	22(2)	3.4(3)	5.294(6)	1.779	1.779
1.042(25)	1.0(4)	0.16(6)	8.389(13)	4.619	1.779, 2.838
1.302(10)	24(3)	3.8(4)	5.826(8)	1.779	1.779
1.829(15)	2.4(3)	0.38(5)	6.357(15)	1.779	1.779
1.978(15)	1.9(3)	0.30(4)	6.506(15)	1.779	1.779
2.206@	75(3)	11.9(4)	4.955(9)	0	——
2.545@	3.4(3)	0.53(4)	5.294(6)	0	——
2.621(10)	6.8(5)	1.08(7)	7.149(10)	1.779	1.779
2.986(15)	0.52(10)	0.082(15)	7.514(15)	1.779	1.779
3.067(15)	1.14(13)	0.18(2)	5.826(8)	0	
3.212(15)	1.14(13)	0.18(2)	5.961(15)	0	——
3.326(15)	1.01(13)	0.16(2)	6.075(15)	0	——
3.414(15)	2.2(2)	0.34(3)			
3.579(15)	2.4(3)	0.38(5)	6.328(15)	0	——
3.715(15)	1.3(3)	0.21(4)	8.243(11)	1.779	1.779
3.853@	14.8(9)	2.34 12	8.389(13)	1.779	1.779
3.905(15)	4.5(4)	0.71(6)	6.654(15)	0	——
4.008(20)	1.7(4)	0.27(6)	8.535(14)	1.779	1.779
4.335(20)	6.8(5)	1.08(7)	7.085(20)	0	——
4.493(20)	2.1(3)	0.33(4)	7.242(20)	0	——
4.640(25)	1.6(3)	0.25(4)	7.389(25)	0	——
4.852(20)	1.7(3)	0.27(4)	9.394(17)	1.779	1.779
5.008(20)	1.5(3)	0.23(4)	7.757(20)	0	——
5.359(15)	4.4(5)	0.69(7)	8.108(15)	0	——
5.493(15)	5.8(5)	0.92(7)	8.243(11)	0	——
5.632@	100(3)	15.8(4)	8.389(13)	0	——
5.784(20)	5.5(5)	0.87(7)	8.535(14)	0	——
6.062(30)	0.89(19)	0.14(3)	8.811(20)	0	——
6.676(30)	1.0(2)	0.16(3)	9.394(17)	0	——
6.965(50)***	0.10(2)***	0.016(3)	9.714(50)	0	——
7.105(30)***	0.21(2)***	0.033(3)	9.854(30)	0	——
7.343(30)***	0.12(1)***	0.019(2)	10.092(30)	0	——
7.789(30)***	0.18(1)***	0.028(2)	10.538(30)	0	——

* All values taken from [1979Vi01] except where noted.
** Values from adopted levels in ENSDF [2013Ba53].
*** [1985Zh05].
@ Proton peaks that were used as energy calibrations.
@@ Deduced by evaluator from beta branching (table 2 in [1979Vi01]) and proton branching ratios from these states (tables 3 and 4 in [1979Vi01]).

Table 14
β-p emission from ^{33}Ar*, $T_{1/2}$ = 173(2) ms, $BR_{\beta p}$ = 38.8(14)%**

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{33}Cl)***	$E_{daughter}$(^{32}S)[@]	coincident γ-rays[@]
0.786(10)	0.065(6)	0.0202(17)	5.307(4)	2.2306(2)	2.230
1.358(8)	0.54(4)	0.168(9)	5.866(8)	2.2306(2)	2.230
1.696(2)	1.33(64)	0.41(20)	3.973(2)	0	——
1.717(6)	0.019(4)	0.0060(11)	7.762(3)	3.7784(10)	1.549, 2.230
1.744(6)	0.107(11)	0.0332(32)	6.254(3)	2.2306(2)	2.230
1.819(5)	0.026(4)	0.0081(13)	6.326(5)	2.2306(2)	2.230
1.837(2)	1.52(10)	0.471(22)	4.113(2)	0	——
2.087(5)	0.014(2)	0.0043(7)	6.595(5)	2.2306(2)	2.230
2.166(3)	8.81(56)	2.73(12)	4.442(3)	0	——
2.442(6)	0.004(1)	0.0012(3)	8.491(5)	3.7784(10)	1.549, 2.230
2.444(5)	0.049(4)	0.0153(12)	6.951(5)	2.2306(2)	2.230
2.559(2)	1.17(8)	0.362(17)	4.835(2)	0	——
2.795(7)	0.022(4)	0.0069(12)	7.292(3)	2.2306(2)	2.230
2.830(3)	0.156(16)	0.0483(44)	5.107(3)	0	——
2.898(10)	0.045(5)	0.00141(14)	7.405(10)	2.2306(2)	2.230
2.976(7)	0.121(13)	0.0376(35)	7.484(7)	2.2306(2)	2.230
3.033(4)	0.24(2)	0.0748(55)	5.310(4)	0	
3.049(7)	0.116(12)	0.0359(32)	7.557(7)	2.2306(2)	2.230
3.110(10)	0.0023(7)	0.0007(2)	9.153(4)	3.7784(10)	1.549, 2.230
3.162(6)	0.0145(65)	0.0045(20)	7.666(3)	2.2306(2)	2.230
3.272(3)	100	31.0(14)	5.549(3)	0	——
3.455(4)	0.296(16)	0.0918(48)	5.731(4)	0	——
3.577(6)	0.171(15)	0.0531(40)	8.077(3)	2.2306(2)	2.230
3.625(6)	0.048(8)	0.0150(25)	8.132(6)	2.2306(2)	2.230
3.688(5)	0.027(5)	0.0085(16)	8.183(3)	2.2306(2)	2.230
3.978(3)	2.37(15)	0.735 (34)	6.254(3)	0	——
4.049(5)	0.026(4)	0.0082(13)	8.558(4)	2.2306(2)	2.230
4.341(5)	0.021(3)	0.00645(80)	8.848(5)	2.2306(2)	2.230
4.465(8)	0.0046(13)	0.00142(40)	8.969(5)	2.2306(2)	2.230
4.614(5)	0.0118(19)	0.00367(55)	9.119(4)	2.2306(2)	2.230
4.646(6)	0.0151(21)	0.00467(62)	9.153(4)	2.2306(2)	2.230
4.866(5)	0.0025(3)	0.00079(10)	7.143(5)	0	——
5.012(4)	0.031(3)	0.0097(8)	7.292(3)	0	——
5.077(6)	0.0021(5)	0.00066(16)	9.584(6)	2.2306(2)	2.230
5.196(4)	0.723(51)	0.224(12)	7.473(4)	0	——
5.260(4)	0.152(18)	0.047(5)	7.537(4)	0	——
5.388(4)	0.0742(84)	0.0234(24)	7.666(3)	0	——
5.483(3)	0.0268(41)	0.0083(12)	7.760(3)	0	——
5.799(3)	0.400(29)	0.124(7)	8.077(3)	0	——
5.902(3)	0.297(21)	0.092(5)	8.183(3)	0	——
6.038(9)	0.0092(14)	0.00284(40)	8.315(9)	0	——
6.199(10)	0.0032(5)	0.00100(15)	8.491(5)	0	——
6.291(10)	0.0445(52)	0.0138(15)	8.558(4)	0	——
6.542(8)	0.0017(3)	0.00053(9)	8.819(8)	0	——
6.589(10)	0.0009(3)	0.00027(8)	8.865(10)	0	——
6.683(10)	0.0332(39)	0.0103(10)	8.969(5)	0	——
6.835(10)	0.0055(8)	0.00170(23)	9.119(4)	0	——
6.865(9)	0.0016(3)	0.00049(10)	9.142(9)	0	——
6.925(9)	0.00012(3)	0.0032(4)	9.202(9)	0	——
7.01-7.12	0.00074(29)	0.00023(9)		0	——
7.12-7.22	0.00023(10)	0.00007(3)		0	——
7.22-7.32	0.00103(14)	0.00032(4)		0	——
7.43-7.53	0.00039(10)	0.00012(3)		0	——
7.53-7.63	0.00032(10)	0.00010(3)		0	——
7.63-7.73	0.00026(10)	0.00008(3)		0	——
7.73-8.25	0.00019(10)	0.00006(3)		0	——
8.25-9.28	0.00013(10)	0.00004(3)		0	——

* All values taken from [2010Ad03], except where noted.

** From [2010Ad03]. Other: 38.7(10)% [1987Bo21].

*** Energy calculated from proton energies and S_p (^{33}Cl) = 2276.8(4) keV [2021Wa16]. For levels de-excited by more than one proton transition, E_{level} (emitter) is the weighted average.

[@] Values from adopted levels in ENSDF [2011Ou01].

Table 15
β-p emission from ^{37}Ca, $T_{1/2}$ = 181.1(10) ms*, $BR_{\beta p}$ = 82.1(8)%**

E_p***	I_p(rel)@@	I_p(abs)@	$E_{emitter}$ (^{37}K)**	$E_{daughter}$(^{36}Ar)@@@	coincident γ-rays@@@
0.418(5)	a@	a@	6.6040(47)	4.3291(7)	2.359, 1.970
0.585(2)	b@	b@	4.4128(13)	1.9704(1)	2.359, 1.970
0.893(2)	11(1)	5.2(5)	2.7501(8)	0	
1.223(2)	c@	c@	5.0506(13)	1.9704(1)	1.970
1.293(2)	d@	d@	5.1202(16)	1.9704(1)	1.970
1.382(2)	≈0.4	≈0.2	3.2394(18)	0	——
1.438(4)	e@	e@	7.4733(33)	4.1783(1)	2.208, 1.970
1.496(2)	f@	f@	5.3230(18)	1.9704(1)	1.970
1.596(3)	0.124(28)	0.058(13)	5.423.7(30)	1.9704(1)	1.970
1.765(3)	6.9(4)	3.2(2)	3.6222(25)	0	——
1.796(3)	g@	g@	5.6234(24)	1.9704(1)	1.970
1.983(3)	7.5(4)	3.5(2)	3.8402(31)	0	——
2.187(3)	h@	h@	6.0142(28)	1.9704(1)	1.970
2.264(3)	i@	i@	6.0915(28)	1.9704(1)	1.970
2.334(9)	0.13(4)	0.06(2)	4.191(9)	0	——
2.566(2)	2.4(1)-b@	1.10(5)-b@	4.4128(13)	0	——
2.604(4)	j@	j@	6.4313(33)	1.9704(1)	1.970
2.638(4)	3.0(2)	1.4(1)	4.4955(39)	0	——
3.159(5)	2.1(21)	1.0(10)	5.0161(43)	0	——
3.194(2)	100-c@	46.7-c@	5.0506(13)	0	——
3.263(2)	18.2(9)-d@	8.5(4)-d@	5.1202(16)	0	——
3.411(5)	k@	k@	7.2380(47)	1.970	1.970
3.466(2)	1.20(9)-f@	0.56(4)-f@	5.3230(18)	0	——
3.500(7)	0.11(2)	0.052(7)	5.3570(66)	0	——
3.541(4)	l@	l@	7.2380(47)	1.9704(1)	1.970
3.589(5)	0.28(2)	0.13(1)	5.4459(47)	0	——
3.608(5)	0.47(4)	0.22(2)	5.4648(46)	0	——
3.646(4)	e'@	e'@	7.4733(33)	1.9704(1)	1.970
3.712(5)	0.084(15)	0.039(7)	5.5693(45)	0	——
3.766(3)	0.32(4)-g@	0.15(2)-g@	5.6234(24)	0	——
3.804(5)	0.21(2)	0.10(1)	7.6315(47)	1.9704(1)	1.970
3.931(5)	0.12(2)	0.054(8)	5.7882(49)	0	——
3.978(4)	m@	m@	7.8053(37)	1.9704(1)	1.970
4.007(5)	0.21(2)	0.1(1)	7.8343(46)	1.9704(1)	1.970
4.075(5)	0.39(4)	0.18(2)	5.9316(46)	0	——
4.157(3)	1.24(9)-h@	0.58(4)-h@	6.0142(28)	0	——
4.234(3)	0.80(6)-i@	0.37(3)-i@	6.0915(28)	0	——
4.466(5)	0.30(2)	0.14(1)	6.3228(48)	0	——
4.557(5)	0.163(3)	0.076(12)	6.4144(48)	0	——
4.574(4)	0.28(4)-j@	0.13(2)-j@	6.4313(33)	0	——
4.747(5)	0.13(6)-a@	0.06(3)-a@	6.6040(47)	0	——
4.826(5)	0.043(9)	0.020(4)	6.6827(47)	0	——
4.882(5)	0.017(4)	0.008(2)	6.7389(47)	0	——
4.966(5)	0.032(9)	0.015(4)	6.8229(47)	0	——
5.116(5)	0.34(4)	0.16(2)	6.9729(47)	0	——
5.216(5)	0.24(2)	0.11(1)	7.0727(47)	0	——
5.325(4)	0.64(15)	0.30(7)	7.1823(35)	0	——
5.381(5)	0.099(15)-k@	0.046(7)-k@	7.238(5)	0	——
5.511(4)	0.45(4)-l@	0.21(2)-l@	7.3685(33)	0	——
5.616(4)	0.75(9)-e-e'@	0.35(4)-e-e'@	7.4733(33)	0	——
5.685(5)	0.045(9)	0.021(4)	7.5423(47)	0	——
5.803(5)	0.073(15)	0.034(7)	7.6598(49)	0	——
5.948(4)	0.34(4)-m@	0.16(2)-m@	7.8053(37)	0	——
6.170(5)	0.084(15)	0.039(7)	8.0273(53)	0	——

* [1997Tr05].
** [1991Ga23].
*** E_p values deduced from ^{37}K level [1991Ga23] and S(p)=1857.0(14) [2021Wa16] for ^{37}K.
@ Sum of unresolved proton intensities from the emitting state. [1991Ga23] recorded multiple decays from the state with B(GT) values, but did not record individual proton branching ratios.
@@ I_p values from [2012Ni01] based on B(GT) values [1991Ga23].
@@@ Values from adopted levels in ENSDF [2012Ni01].

Table 16
β-p emission from ^{41}Ti*, $T_{1/2}$ = 81.9(5) ms[@], $BR_{\beta p}$ = 92.4(6)%[@@].

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{41}Sc)**	$E_{daughter}$(^{40}Ca)***	coincident γ-rays***
0.771(12)	3.3(25)	0.86(66)	5.762(12)	3.9044	3.904
1.011(2)	19.78(12)	5.15(3)	2.096(2)	0	——
1.280(15)	3.92(73)	1.02(19)	6.270(15)	3.9044	——
1.581(2)	18.28(19)	4.76(5)	2.666(2)	0	——
1.627(10)	2.61(8)	0.68(2)	2.712(10)	0	——
1.888(40)	2.99(12)	0.78(3)	6.893(28)	3.9044	3.904
2.026(10)	1.98(69)	0.52(18)	6.464(10)	3.3526(1)	3.353
2.131(25)	2.99(8)	0.78(2)	6.953(25)	3.7367(1)	3.737
2.328(3)	15.67(8)	4.08(2)	3.413(3)	0	——
2.472(3)	8.96(8)	2.33(2)	3.559(3)	0	——
2.604(13)	2.35(50)	0.61(13)	3.689(13)	0	——
2.721(8)	4.10(12)	1.07(3)	3.806(8)	0	——
2.873(8)	2.5(6)	0.66(16)	3.958(8)	0	——
3.159(4)	62.7(3)	16.33(6)	4.244(4)	0	——
3.232(19)	3.0(7)	0.78(18)	4.317(19)	0	——
3.422(9)	2.61(8)	0.68(2)	4.507(9)	0	——
3.570(9)	2.5(2)	0.65(6)	4.655(9)	0	——
3.690(5)	5.9(6)	1.55(16)	4.775(5)	0	——
3.750(8)	11.6(4)	3.01(10)	4.868(4)	0	——
3.843(4)	28.4(3)	7.39(7)	4.928(5)	0	——
3.928(8)	3.0(5)	0.78(14)	5.013(8)	0	——
3.987(18)	2.7(5)	0.71(12)	5.072(18)	0	——
4.294(4)	13.8(7)	3.59(17)	5.379(4)	0	——
4.410(12)	1.49(8)	0.39(2)	5.495(12)	0	——
4.495(6)	5.8(6)	1.5(2)	5.580(6)	0	——
4.683(7)	2.4(4)	0.62(9)	5.768(7)	0	——
4.754(4)	14.93(19)	3.89(5)	5.839(4)	0	——
4.800(10)	4.48(12)	1.17(3)	5.885(10)	0	——
4.853(3)	100.00(8)	26.05(2)	5.938(3)	0	——
4.951(10)	7.84(19)	2.04(5)	6.036(10)	0	——
4.999(17)	3.3(4)	0.86(9)	6.084(15)	0	——
5.068(11)	3.2(4)	0.83(10)	6.153(11)	0	——
5.288(14)	3.0(4)	0.79(10)	6.373(14)	0	——
5.349(40)	2.4(5)	0.63(13)	6.434(40)	0	——
5.498(60)	1.40(8)	0.36(2)	6.583(60)	0	——
5.587(40)	2.2(5)	0.58(13)	6.672(40)	0	——
5.743(14)	2.8(15)	0.73(38)	6.828(14)	0	——
5.861(14)	1.0(4)	0.27(10)	6.946(14)	0	——
6.096(20)	0.75(19)	0.19(5)	7.181(20)	0	——
6.274(19)	0.56(19)	0.15(5)	7.359(19)	0	——
6.530(38)	0.37(12)	0.10(3)	7.615(38)	0	——
6.893(60)	0.28(10)	0.073(25)	7.978(60)	0	——

* Values are from a weighted average of [1998Bh12, 1998Li46, 1997Ho12, 1974Se11, 2015Sh16], except where noted.
** Energy calculated from proton energies and S_p (^{41}Sc) = 1084.93(7) keV [2021Wa16].
*** Values from adopted levels in ENSDF [2017Ch09].
[@] [2015Sh16].
[@@] Weighted average of 91.6(6)% [2007Do17], 95.3(23)% [1998Bh12], and 100.3(22)% [1997Tr11].

Table 17
β-p emission from ^{45}Cr*, $T_{1/2}$ = 60.9(4) ms, $BR_{\beta p}$ = 34.4(8)%

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{45}V)**	$E_{daughter}$(^{44}Ti)***	coincident γ-rays***
0.945(31)	2.0(15)	0.4(3)			
1.303(25)	2.6(10)	0.5(2)			
1.468(27)	2.0(15)	0.4(2)			
1.609(28)	2.0(15)	0.4(2)			
2.087(9)	100	19.6(15)	4.796(9)	1.0831(1)	1.083

* All values taken from [2007Do17] except where noted.
** Energy calculated from proton energies and S_p (^{45}V) = 1626.8(11) keV [2021Wa16].
*** Values from adopted levels in ENSDF [2011Ch39].

Table 18
β-p emission from ^{49}Fe*, $T_{1/2}$ = 64.7(3) ms, $BR_{\beta p}$ = 56.7(4)%

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{49}Mn)	$E_{daughter}$(^{48}Cr)**	coincident γ-rays**
1.120(39)	3.8(14)	1.3(5)	3.921	0.7522(1)	0.752
1.321(24)	0.6(3)	0.2(1)			
1.544(17)	4.3(7)	1.5(3)	4.380	0.7522(1)	0.752
1.975(13)	100	34.5(2)	4.809	0.7522(1)	0.752

* Values are taken from [2007Do17], energy and intensity values are from a weighted average of [2007Do17, 1996Fa09, 1970Ce02]:
** Values from adopted levels in ENSDF [2006Bu08].

Table 19
β-p emission from ^{53}Ni*, $T_{1/2}$ = 55.2(7) ms, $BR_{\beta p}$ = 22.7(10)%$^{@@}$

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{53}Co)***	$E_{daughter}$(^{52}Fe)$^{@}$	coincident γ-rays$^{@}$
1.077(28)	15(4)	0.8(2)			
1.251(27)	15(4)	0.8(2)			
1.639(22)	33(4)	1.8(2)			
1.921(7)**	100	5.5(4)	4.395(7)	0.8495(1)	0.849
2.111(24)	44(6)	2.4(3)			
2.399(26)	59(9)	3.2(5)			

* Values are from [2007Do17], except where noted.
** [2016Su10].
*** Energy calculated from proton energies and S_p (^{53}Co) = 1616.3(17) keV [2021Wa16].
$^{@}$ Values from adopted levels in ENSDF [2015Ya15].
$^{@@}$ Weighted average of 23.4(10)% [2007Do17] and 22.0(10)% [2016Su10].

Table 20
β-p emission from ^{57}Zn*, $T_{1/2}$ = 38(2) ms, $BR_{\beta p}$ = 90(10)%**.

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{57}Cu)***	$E_{daughter}$(^{56}Ni)$^{@}$	coincident γ-rays$^{@}$
1.168(15)	16(4)	3.5(12)	4.559(15)	2.7006(7)	2.701
1.685(17)	4(2)	0.9(5)	2.375(17)	0	——
1.836(15)	36(6)	8(2)	2.526(15)	0	——
1.902(12)	100(10)	22(5)	5.293(12)	2.7006(7)	2.701
2.531(16)	66(8)	14.5(36)	3.221(16)	0	——
3.092(21)	25(5)	5.5(16)	3.782(21)	0	——
3.514(24)	11(3)	2.4(8)	4.204(24)	0	——
3.684(25)	6(2)	1.3(5)	4.374(25)	0	——
3.871(26)	3(2)	0.7(5)	4.561(26)	0	——
4.474(30)	7(3)	1.5(7)	5.164(30)	0	——
4.595(29)	81(9)	18(4)	5.300(29)	0	——

* Values are taken from [2002Jo09] except where noted.
** From [2007Bl09]. Other: $>$65% [1979Vi01].
*** Energy calculated from proton energies and S_p (^{57}Cu) = 690.3(4) keV [2021Wa16].
$^{@}$ Values from adopted levels in ENSDF [2011Hu08].

Table 21
β-p emission from ^{61}Ge*, $T_{1/2}$ = 40.7(4) ms, $BR_{\beta p}$ = 78(3)%**.

E_p	I_p(abs)	$E_{emitter}$ (^{61}Ga)***	$E_{daughter}$(^{60}Zn)	coincident γ-rays
3.169(11)	62(4)	3.419(50)	0	——

* All values taken from [2017GoZT], except where noted.
** Weighted ave of [2017GoZT] and [2007Bl09].
*** Energy calculated from proton energy and S_p (^{61}Ga) = 250(40) keV [2021Wa21].

Table 22
β-p emission from ^{65}Se*, $T_{1/2}$ = 34.2(2) ms, $BR_{\beta p}$ = 94^{+6}_{-4}%.

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{65}As)***	$E_{daughter}$(^{64}Ge)@	coincident γ-rays@
2.642(15)	40(5)	18(2)	3.448(57)	0.9017(3)	0.902
3.532(16)	100(5)	44(2)	3.448(57)	0	——
3.77(3)**					

* All values taken from [2017GoZT], except where noted.
** from [2011Ro47] only
*** Energy calculated from proton energies and S_p (^{65}As) = -90(80) keV [2021Wa16]. Value shown is the weighted average of the two transitions.
@ Values from adopted levels in ENSDF [2011Hu08].

Table 23
β-p emission from ^{69}Kr, $T_{1/2}$ = 28(1) ms*, $BR_{\beta p}$ = 100%.

E_p	I_p(rel)	I_p(abs)	$E_{emitter}$ (^{69}Br)	$E_{daughter}$(^{68}Se)@	coincident γ-rays@
0.641(42)*	3.6(9)	1.9(5)*	0*	0	——
0.751**$^{+.132}_{-.042}$	1.0(2)	0.5(1)**	0+x**	0	——
2.939(22)*	100	52.5(65)*	3.153(45)***	0.8538(2)	0.854

* [2014De41].
** [2011Ro47]
*** Energy calculated from proton energies and S_p (^{69}Br) = -640(40) keV [2021Wa16].
@ Values from adopted levels in ENSDF [2012Mc02].

Table 24
β-p emission from ^{73}Sr*, $T_{1/2}$ = 23.1(14) ms, $BR_{\beta p}$ = 100%**.

E_p	I_p(rel)%	I_p(absb)%	$E_{emitter}$ (^{73}Rb)***	$E_{daughter}$(^{72}Kr)	coincident γ-rays
0.64(4)	5(3)@	2(1)@	0.0	0.0	——
1.15(4)	10(5)@	4(2)@			
3.14(2)	61(6)	24(9)	3.21(5)	0.709	0.709
3.85(2)	100	39(7)	3.21(5)	0	——

* All values taken from [2019Si33], except where noted.
** Expected to be 100% as the daughter ^{73}Rb is unbound by 570(20) keV [2017Wa10].
*** Energy calculated from proton energies and S_p (^{73}Rb) = -640(40) keV [2021Wa16].
@ Estimated from Fig 1 of [2020Ho17].

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