^{31}Cl εp decay 2011SaZM,2006Ka11,1996Og01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

Parent: ^{31}Cl: E=0; $J^\pi=3/2^+$; $T_{1/2}$=190 ms *1*; Q(εp)=5877 *3*; %εp decay=2.4 *2*

^{31}Cl-%εp decay: from Adopted Levels of ^{31}Cl in ENSDF.

2011SaZM: ^{31}Cl produced in ^{32}S(p,2n) E=40 MeV/nucleon reaction and separated using MARS recoil spectrometer at Texas A&M University accelerator facility. Measured Ep, Ip.

2006Ka11: ^{31}Cl produced by bombarding ZnS target with 40 or 45 MeV protons through ^{32}S(p,2n) reaction; product nuclei were accelerated and mass separated using the IGISOL facility, implanted on carbon foil; One HPGe detector and three double sided silicon strip detectors backed with three thick silicon detectors were used; Measured: β delayed E_γ, I_γ, E_p, I_p.

1996Og01: ^{31}Cl produced by bombarding ZnS target with 45-MeV protons; helium-jet transport, ΔE gas + E silicon as a particle telescope; analyzed proton spectra.

Others: 1985Ay02, 1983Ay02, 2009TrZY, 2022Bu14 – reported $I^{260}_{\beta p}=(8.3\ +12-9)\times10^{-6}$ and $\Gamma_p/\Gamma=(2.5\ +4-3)\times10^{-4}$ for 260-keV resonance of ^{31}Cl.

^{30}P Levels

E(level)	J^π	$T_{1/2}$	Comments
0	1^+	2.500 min *2*	J^π,$T_{1/2}$: from Adopted Levels.

Delayed Protons (^{30}P)

Particle normalization: from decay mode branching/ΣI_p: where ΣI_p=184 *4*.

E(p)	E(^{30}P)	I(p)[†][@]	E(^{31}S)[#]	Comments
780 *3*	0	20.4 *2*	6937	E(p): weighted average of 762 *14* (2006Ka11) and 780 *2* (2011SaZM). I(p): Other: 9.1 *22* (2006Ka11).
877 *3*	0	12.4 *2*	7037	E(p): weighted average of 853 *18* (2006Ka11), 877 *2* (2011SaZM), and 845 *30* (1985Ay02). I(p): other: 1.2 *12* (2006Ka11).
992 *2*	0	100 *4*	7157	E(p): weighted average of 978 *15* (2006Ka11), 993 *2* (2011SaZM), 986 *10* (1985Ay02 – earlier value 989 *15* (1983Ay02)), and 986 *10* (1996Og01). I(p): others: 100 *2* (1985Ay02), 100 *4* (2006Ka11).
1185 *3*	0	2.7 *1*	7355	E(p): weighted average of 1175 *19* (2006Ka11), 1185 *3* (2011SaZM), and 1173 *30* (1985Ay02). I(p): other: 1.7 *6* (2006Ka11).
1345[‡] *17*	0	1.3[‡] *12*	7521	
1520 *3*	0	21.0 *4*	7702	E(p): weighted average of 1521 *20* (2006Ka11), 1520 *3* (2011SaZM), 1520 *15* (1985Ay02 – earlier value 1528 *20* (1983Ay02)), and 1524 *10* (1996Og01). I(p): others: 11 *5* (1996Og01), 13.6 *14* (2006Ka11).
1594[‡] *17*	0	1.4[‡] *2*	7778	
1705 *3*	0	6.4 *2*	7893	E(p): weighted average of 1688 *22* (2006Ka11), 1706 *3* (2011SaZM), and 1695 *20* (1985Ay02). I(p): Other: 3.9 *7* (2006Ka11).
1830 *3*	0	10.9 *2*	8022	E(p): weighted average of 1825 *23* (2006Ka11), 1830 *3* (2011SaZM), and 1827 *20* (1985Ay02). I(p): other: 8.8 *11* (2006Ka11).
1927[‡] *17*	0	1.4[‡] *1*	8122	
2079 *13*	0	1.3 *1*	8280	E(p): weighted average of 2075 *30* (2006Ka11), 2070 *17* (2011SaZM), and 2113 *30* (1985Ay02). I(p): Other: 1.3 *5* (2006Ka11).
2224 *3*	0	2.3 *1*	8429	E(p): weighted average of 2217 *30* (2006Ka11), 2224 *3* (2011SaZM), and 2204 *30*

Continued on next page (footnotes at end of table)

^{31}Cl εp decay 2011SaZM,2006Ka11,1996Og01 (continued)

Delayed Protons (continued)

E(p)	E(^{30}P)	I(p)†@	E(^{31}S)#	Comments
				(1985Ay02).
				I(p): other: 4.1 *8* (2006Ka11).
2289 *17*	0	0.9 *7*	8497	E(p): weighted average of 2299 *30* (2006Ka11) and 2286 *17* (2011SaZM).
				I(p): Other: 1.5 *5* (2006Ka11).
2484 *17*	0	0.91 *6*	8698	E(p): weighted average of 2454 *40* (2006Ka11) and 2489 *17* (2011SaZM).
				I(p): Other: 1.0 *4* (2006Ka11).
2635 *17*	0	0.19 *4*	8854	E(p): weighted average of 2601 *40* (2006Ka11) and 2641 *17* (2011SaZM).
				I(p): Other: 0.4 *3* (2006Ka11).
2798 *20*	0	0.3 *1*	9023	E(p): weighted average of 2751 *40* (2006Ka11) and 2807 *17* (2011SaZM).
				I(p): Other: 0.6 *3* (2006Ka11).

† from 2011SaZM. Values from 2006Ka11 are listed in comments.
‡ From 2011SaZM.
# from E(c.m.)+S(p)(^{31}S)+E(level)(^{30}P), where S(p)=6130.65 *24* (2021Wa16) and E(c.m.) deduced from E(p) listed under comments using E(c.m)=[1+mass(p)/mass(^{30}P)]×E(p).
@ For absolute intensity per 100 decays, multiply by 0.013 *1*.

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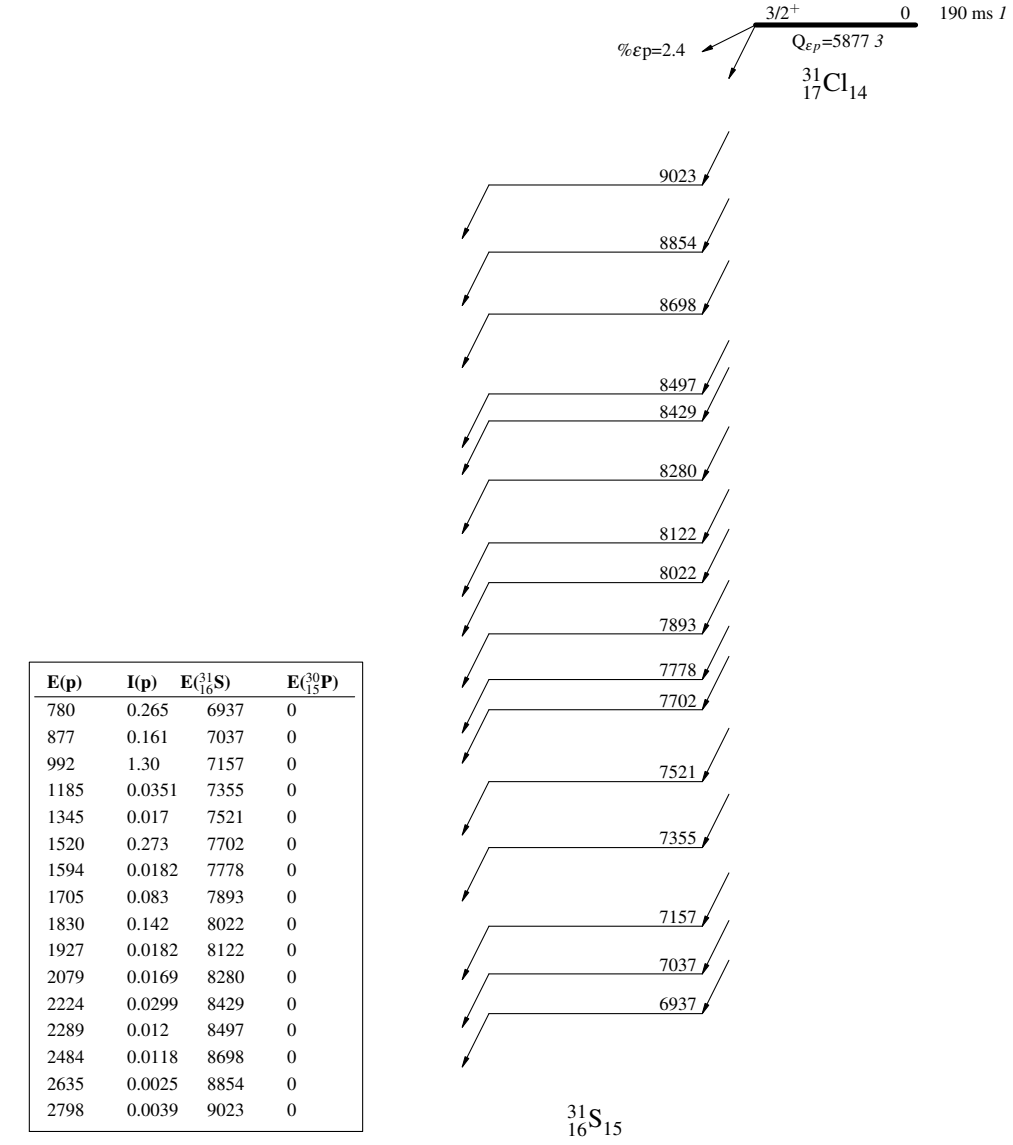
Decay Scheme

I(p) Intensities: I(p) per 100 parent decays



E(p)	I(p)	E($^{31}_{16}$S)	E($^{30}_{15}$P)
780	0.265	6937	0
877	0.161	7037	0
992	1.30	7157	0
1185	0.0351	7355	0
1345	0.017	7521	0
1520	0.273	7702	0
1594	0.0182	7778	0
1705	0.083	7893	0
1830	0.142	8022	0
1927	0.0182	8122	0
2079	0.0169	8280	0
2224	0.0299	8429	0
2289	0.012	8497	0
2484	0.0118	8698	0
2635	0.0025	8854	0
2798	0.0039	9023	0