^{31}Ar β^+p decay 2000Fy01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 111, 2331 (2010)	30-Jun-2010

Parent: ^{31}Ar: E=0.0; $J^\pi=5/2^{(+)}$; $T_{1/2}$=14.4 ms *6*; Q(β^+p)=18070 *SY*; %β^+p decay=63 *7*

Others: 1998Ax02, 2002Fy01.

2000Fy01,1998Ax02,2002Fy01: ^{31}Ar is obtained from the ISOLDE facility at CERN bombarding CaO target with 1 GeV pulsed protons; 13 Si p-i-n diodes, double-sided Si strip, Si surface barrier and HPGe detectors; identified and measured β-particles, delayed proton energy and intensity, exitation energy of ^{30}S deduced following the two-proton emission.

1982Yo02: ^{28}Si(^{3}He,np):Target: natural Si; Projectile: ^{3}He, E=9.5 MeV; 2 Si surface barrier detector, NE213 detector coupled with photomultiplier tube; measured n-p coin from 70° to 160° in steps of 10°; deduced ^{30}S excitation levels, J^π. Most level energies of 1982Yo02 are different than those are reported by 2000Fy01 and data are not listed.

^{30}S Levels

E(level)†	J^π	$T_{1/2}$	E(level)†	E(level)†
0	0^+	1.178 s *5*	6064‡ *3*	7123‡ *10*
2210.6 *5*	2^+		6202‡ *3*	7237?‡# *5*
3402.6 *5*	2^+		6280.1‡ *12*	7295‡ *14*
3666.3 *16*			6338.6‡ *14*	7352‡ *8*
3676 *3*	1		6541‡ *4*	7485 *4*
5136 *2*			6643?‡ *3*	7598 *4*
5217.4 *7*			6762‡ *4*	7693 *4*
5389 *2*			6855‡ *4*	7924‡ *5*
5842 *4*			6927‡ *4*	
5945?‡ *3*			7078‡ *7*	

† Deduced following the ^{31}Ar β^+p decay, except otherwise noted.
‡ Following two-proton decay of ^{31}Ar β^+ decay (2000Fy01).
# Not adopted.

$\gamma(^{30}S)$

E_γ	E_i(level)	J_i^π	E_f	J_f^π
1192	3402.6	2^+	2210.6	2^+
2211	2210.6	2^+	0	0^+

Delayed Protons (^{30}S)

E(p)†	E(^{30}S)	I(p)†&	E(^{31}Cl)	E(p)†	E(^{30}S)	I(p)†&	E(^{31}Cl)
446# *15*	0	0.49# *16*	747	1504 *2*	2210.6	6.2 *2*	4055
754# *15*	2210.6	3.0# *3*	3265	1641#a *8*	2210.6	3.0# *6*	4192
974#a *15*	0	1.4# *2*	1292	1643 *2*	3402.6	2.88 *14*	5390
1131‡ *5*	5217.4	2.7‡ *16*	6662	1819‡ *3*	5217.4	3.0‡ *4*	7384
1133#a *15*	0	2.0# *4*	1456	1870‡ *3*	3402.6	0.8‡ *2*	5626
1211 *4*	5136	1.7 *5*	6677	1923‡ *3*	5217.4	0.44‡ *14*	7494
1289# *9*	2210.6	0.95# *20*	3824	2008 *2*	3402.6	10.0 *2*	5768
1300‡ *13*	5217.4	0.7‡ *11*	6841	2084 *2*	0	100.0 *6*	2444
1416 *2*	0	34.0 *3*	1754	2253 *2*	0	4.0 *3*	2619

Continued on next page (footnotes at end of table)

^{31}Ar β^+p decay 2000Fy01 (continued)

Delayed Protons (continued)

E(p)†	E(^{30}S)	I(p)†&	E(^{31}Cl)	E(p)†	E(^{30}S)	I(p)†&	E(^{31}Cl)
2327‡ *4*	0	5.1‡ *4*	2695	4624# *9*	0	0.7# *2*	5064
2866# *20*	0	1.7# *9*	3265	4730‡ *5*	2210.6	1.68‡ *18*	7390
2881 *3*	3402.6	0.99 *13*	6670	4743# *9*	3676	1.7# *3*	8868
3020‡ *3*	2210.6	1.08‡ *14*	5623	5276 *5*	0	17.6 *3*	5743
3153‡ *4*	2210.6	0.44‡ *10*	5760	5686# *9*	0	0.31# *5*	6162
3242# *12*	3402.6	2.2# *8*	7050	5952‡ *7*	5842	0.19‡ *6*	12310
3249‡ *4*	0	1.17‡ *15*	3649	6049‡ *9*	0	0.51‡ *12*	6542
3416# *12*	0	1.4# *3*	3824	6145‡ *7*	0	0.51‡ *12*	6642
3432‡ *3*	3666.3	0.89‡ *11*	7504	6175# *12*	2210.6	2.8# *12*	8868
3534# *10*	3676	2.4# *4*	7617	6386‡ *7*	5389	0.26‡ *5*	12310
3561 *11*	3402.6	3.6 *8*	7373	6540‡ *8*	5217.4	0.84‡ *11*	12310
3634 *3*	0	6.1 *8*	4046	6555# *11*	0	1.1# *2*	7050
3806‡ *4*	5217.4	0.53‡ *13*	9455	6950 *9*	0	0.70 *9*	7474
3902‡ *3*	2210.6	2.22‡ *14*	6533	7074 *9*	0	0.49 *7*	7602
3903# *9*	0	3.5# *6*	4319	8095@ *12*	3666.3	0.55@ *14*	12313
4030 *3*	2210.6	7.0 *2*	6666	8347 *15*	3402.6	0.51 *6*	12320
4187# *9*	0	2.6# *7*	4613	8860‡ *19*	0	0.22‡ *19*	9448
4200‡ *4*	7693	1.09‡ *18*	12310	9379# *13*	0	0.33# *20*	9978
4289‡ *4*	7598	0.31‡ *8*	12310	9493‡ *20*	2210.6	0.30‡ *4*	12313
4386# *12*	0	1.2# *2*	4818	11657@ *25*	0	0.23@ *11*	12313
4389‡ *5*	7485	0.59‡ *11*	12310	11858‡ *29*	0	0.034‡ *3*	12547
4466# *10*	0	0.69# *20*	4901				

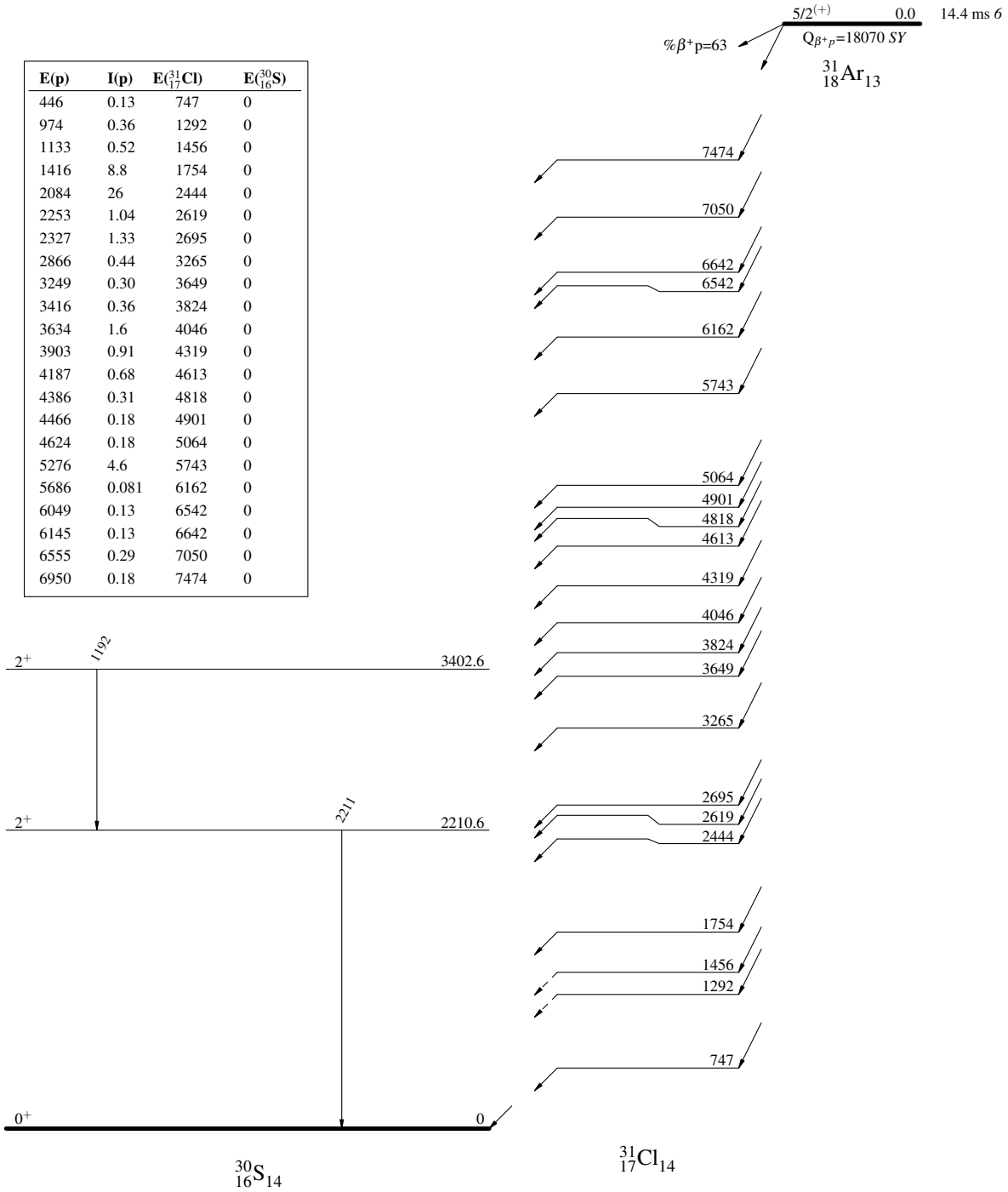
† From 2000Fy01, except otherwise noted.
‡ Reported by 2000Fy01 only.
# Reported by 1998Ax02 only.
@ From 1998Ax02.
& For absolute intensity per 100 decays, multiply by 0.26 *3*.
[a] Placement of transition in the level scheme is uncertain.

^{31}Ar β^+p decay 2000Fy01

Decay Scheme

I(p) Intensities: Relative I(p)

E(p)	I(p)	E($^{31}_{17}$Cl)	E($^{30}_{16}$S)
446	0.13	747	0
974	0.36	1292	0
1133	0.52	1456	0
1416	8.8	1754	0
2084	26	2444	0
2253	1.04	2619	0
2327	1.33	2695	0
2866	0.44	3265	0
3249	0.30	3649	0
3416	0.36	3824	0
3634	1.6	4046	0
3903	0.91	4319	0
4187	0.68	4613	0
4386	0.31	4818	0
4466	0.18	4901	0
4624	0.18	5064	0
5276	4.6	5743	0
5686	0.081	6162	0
6049	0.13	6542	0
6145	0.13	6642	0
6555	0.29	7050	0
6950	0.18	7474	0

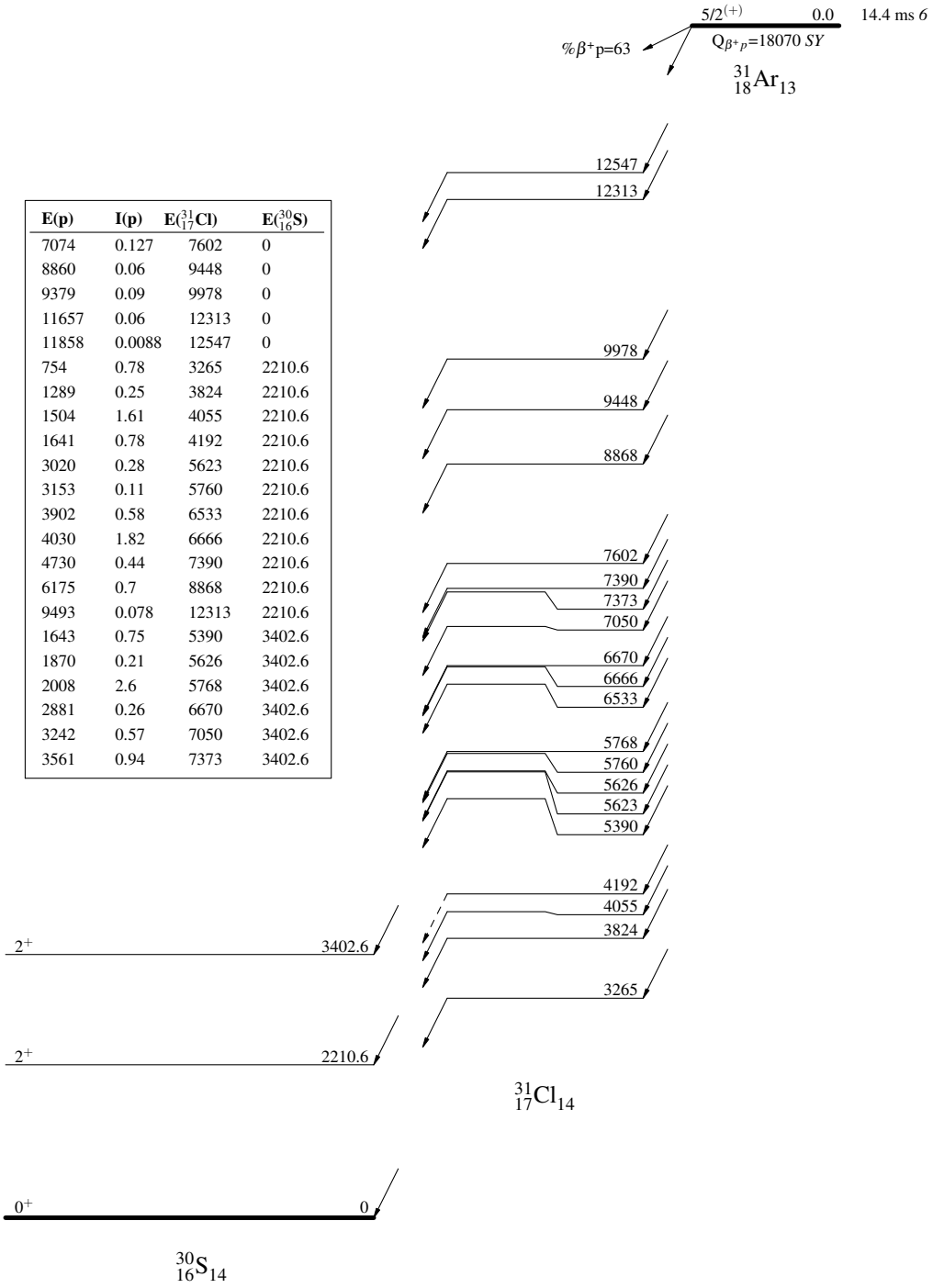


^{31}Ar β^+p decay 2000Fy01

Decay Scheme (continued)

I(p) Intensities: Relative I(p)

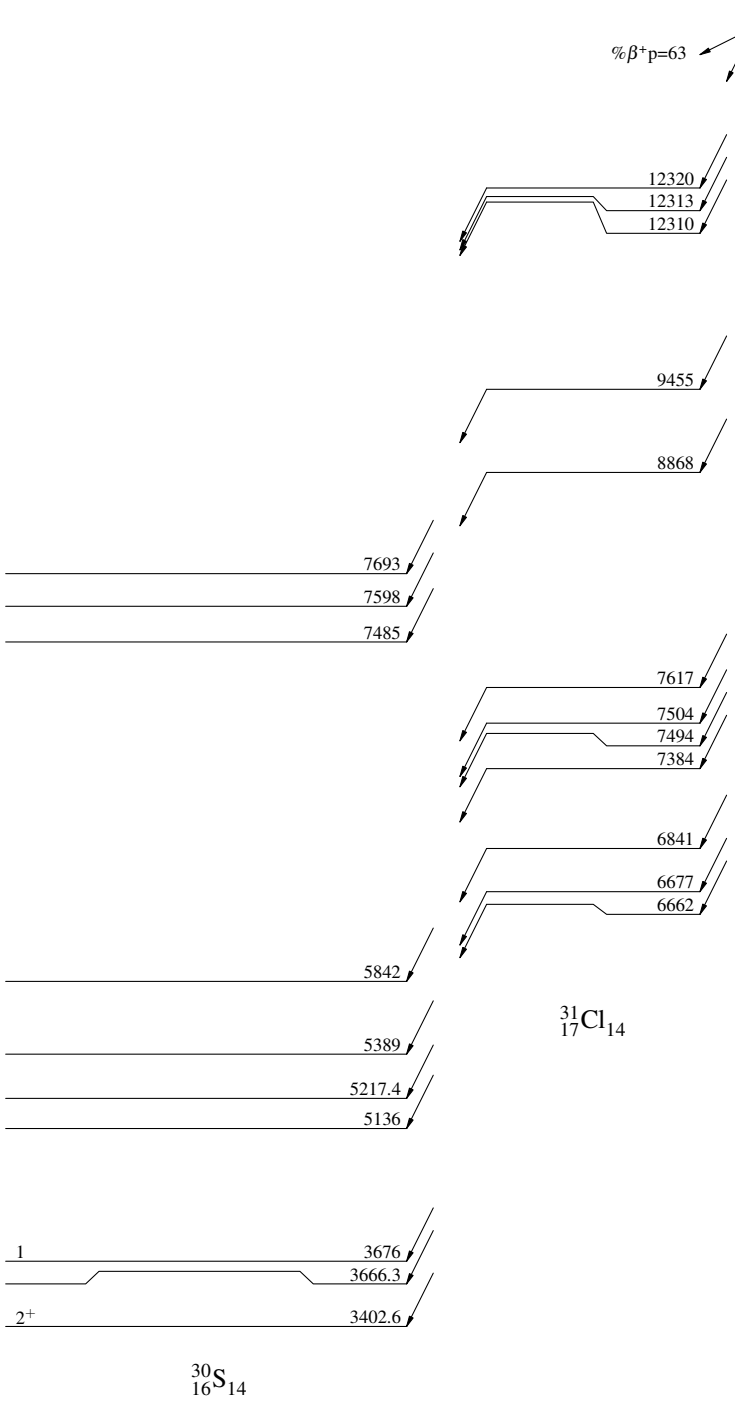
E(p)	I(p)	E($^{31}_{17}$Cl)	E($^{30}_{16}$S)
7074	0.127	7602	0
8860	0.06	9448	0
9379	0.09	9978	0
11657	0.06	12313	0
11858	0.0088	12547	0
754	0.78	3265	2210.6
1289	0.25	3824	2210.6
1504	1.61	4055	2210.6
1641	0.78	4192	2210.6
3020	0.28	5623	2210.6
3153	0.11	5760	2210.6
3902	0.58	6533	2210.6
4030	1.82	6666	2210.6
4730	0.44	7390	2210.6
6175	0.7	8868	2210.6
9493	0.078	12313	2210.6
1643	0.75	5390	3402.6
1870	0.21	5626	3402.6
2008	2.6	5768	3402.6
2881	0.26	6670	3402.6
3242	0.57	7050	3402.6
3561	0.94	7373	3402.6



^{31}Ar β^+p decay 2000Fy01

Decay Scheme (continued)

I(p) Intensities: Relative I(p)



E(p)	I(p)	E($^{31}_{17}$Cl)	E($^{30}_{16}$S)
8347	0.133	12320	3402.6
3432	0.23	7504	3666.3
8095	0.14	12313	3666.3
3534	0.62	7617	3676
4743	0.44	8868	3676
1211	0.44	6677	5136
1131	0.7	6662	5217.4
1300	0.2	6841	5217.4
1819	0.78	7384	5217.4
1923	0.11	7494	5217.4
3806	0.14	9455	5217.4
6540	0.22	12310	5217.4
6386	0.068	12310	5389
5952	0.049	12310	5842
4389	0.15	12310	7485
4289	0.081	12310	7598
4200	0.28	12310	7693