^{31}P(^{3}He,p),(^{3}He,pγ) 1971Gr04,1971Kn04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 112, 1393 (2011)	31-Mar-2011

1971Gr04: ^{31}P(^{3}He,p), E(^{3}He)=12.0 MeV produced from the MIT- ONR Van de Graaff accelerator. Target: a Zn_3P_2 evaporated onto a 5 μg/cm^2 formvar backing, with 51 μg/cm^2 of ^{31}P. Detector: protons analyzed in the MIT multiple-gap spectrograph,FWHM=30 keV. Measured σ(E$_p$,θ), Q. Deduced levels, L, J^π from the DWBA analysis of the data.

1971Kn04: ^{31}P(^{3}He,pγ) E=12,13 MeV produced from the EN and MP tandem Van de Graaff accelerators of the Max-Planck-Institut in Heidelberg and the FN tandem at the Argonne National Laboratory. Target: a 45 μg/cm^2 Zn_3P_2 on a 10 μg/cm^2 carbon backing for σ(E$_p$,θ) measurement and a 0.7 mg/cm^2 on a 100 μg gold backings for p$\gamma(\theta)$ measurement. Detector: nuclear emulsions (FWHM=20 keV), lithium-drifted counter, ion-implanted Si counter for protons; a 38.5 cc Ge(Li) detector for γ-rays (FWHM=6 keV at Eγ=2 and 9 keV at Eγ=4 MeV). Measured σ(E$_p$,θ), p$\gamma(\theta)$,Eγ. Deduced levels.

Others:

1968Co25: ^{31}P(^{3}He,p), E(^{3}He)=6.0 MeV of 150 nA produced from the University of Kansas′ 3 MV Van de Graaff accelerator. Target: 70 μg/cm^2 Zn_3P_2 evaporated onto gold backings. Detector: a Si surface-barrier detectors. Measured σ(E$_p$,θ).

1971Na23: ^{31}P(^{3}He,p), E(^{3}He)=14.0 MeV produced from the Frankfurt/M Van de Graaff accelerator. Target: Zn_3P_2 evaporated onto thin carbon backings, with 70 μg/cm^2 of ^{31}P. Detector: 16 Si surface-barrier detectors. Measured σ(E$_p$,θ), compared with the DWBA predication.

^{33}S Levels

J^π=1/2$^+$ for ^{31}P target.

E(level)	L[a]	E(level)	L[a]	E(level)	L[a]	E(level)	L[a]
0	2	4150[†] *10*	(1)	5725[†] *10*	1	6973[‡] *10*	2
841.8[&] *10*	0	4217[†] *10*	1	5882[#] *15*		7032[‡@] *10*	
1966[†] *10*	(2)	4381[†] *10*		5911[†] *10*		7163[‡@] *10*	(2)
2314[†] *10*	0+2	4434[†] *10*		5931[#] *15*		7346[‡@] *10*	(2)
2869[†] *10*	(2)	4745[†] *10*		5994[#] *15*		7463[‡@] *10*	
2935[†] *10*	(3)	4761[#] *15*		6083[#] *15*		7567[‡@] *10*	
2974[†] *10*	(3)	4932[@] *10*	1	6251[#] *15*		7902[‡@] *10*	0
3222[†] *10*	1	4955[#] *15*		6278[#] *15*		7920[&]	
3832[†] *10*		5285[†] *10*		6374[†] *10*	(2)	8013[‡] *10*	
3941[†] *10*	2	5414[#] *15*		6512[‡] *10*		8107[‡] *10*	
4062[†] *10*	0+2	5475.0[&] *16*	0	6684[‡@] *10*		8329[‡] *10*	
4109[#] *15*		5610[†] *10*		6900[‡] *10*	2		

[†] Weighted average from 1971Gr04 and 1971Kn04.
[‡] From 1971Gr04 only.
[#] From 1971Kn04 only.
[@] Probably doublet in 1971Gr04.
[&] From Eγ in 1971Kn04.
[a] From the comparison of the data with the DWBA predication in 1971Gr04, unless otherwise indicated.

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$\gamma(^{33}S)$

E_i(level)	E_γ †	E_f	E_i(level)	E_γ †	E_f	E_i(level)	E_γ †	I_γ †	E_f
1966	1968	0	3941	1967	1966	4745	4747		0
2314	1471	841.8		3093	841.8	5475.0	4632.7 *10*	85	841.8
	2313	0		3935	0		5475.0 *16*	15	0
2974	1002	1966	4062	1180	2869	6083	6091		0
	2970	0		3207	841.8	6374	6380		0
3222	2379	841.8		4049	0	7920	7078		841.8
	3221	0	4217	1344	2869				
3832	963	2869	4381	4377	0				

† From 1971Kn04.

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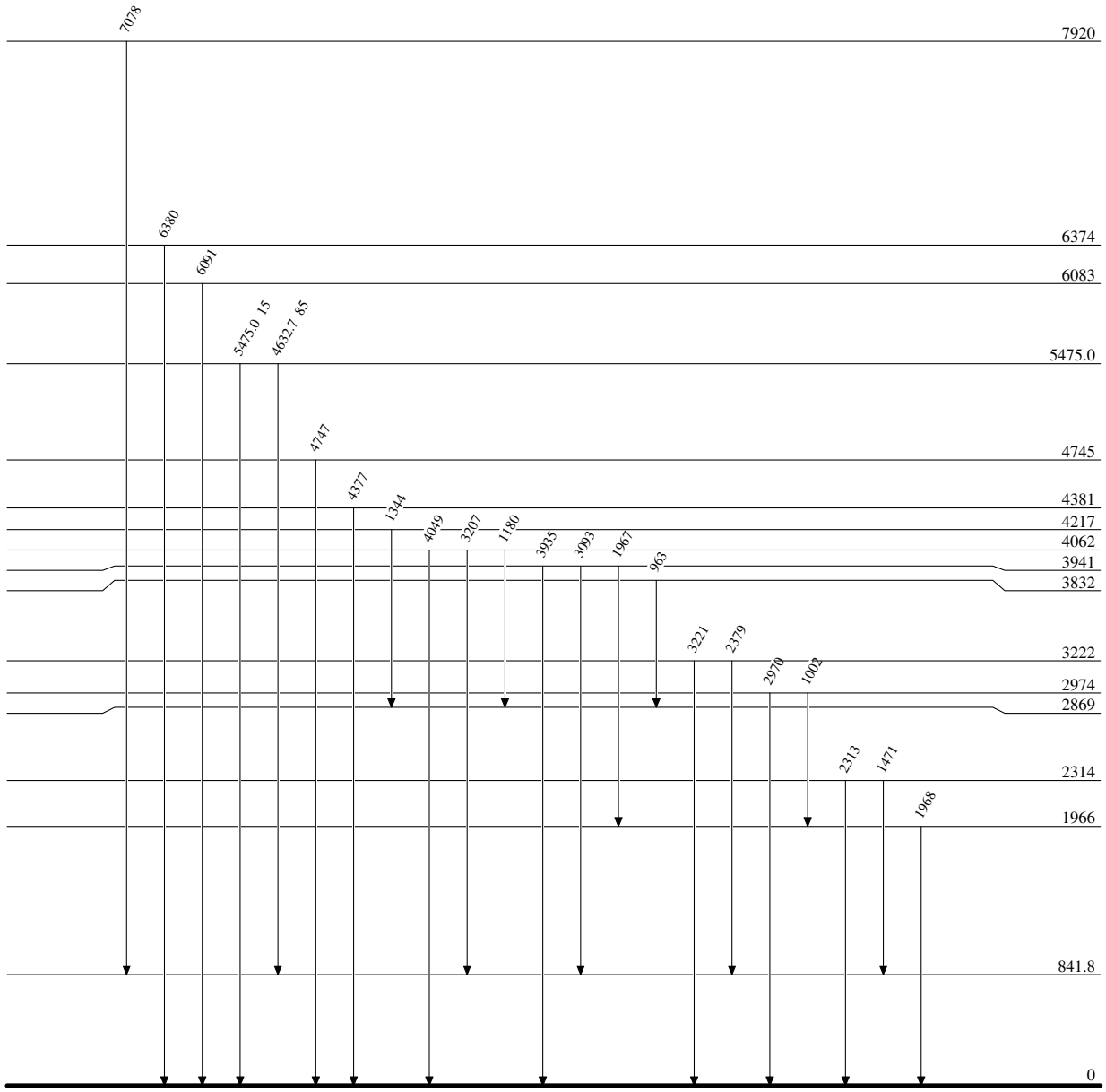
Level Scheme

Intensities: % photon branching from each level



$^{33}_{16}S_{17}$