^{31}P(d,^{3}He) 1968Wi19,1962Cu07,1974Ma34

History

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

$J^{\pi}(^{31}P)=1/2^{+}$.

Other: 1988Bh09.

1968Wi19: E_d=33.8 MeV; measured pulse height spectrum of ^{3}He, angular distribution, DWBA calculations; deduced levels, L, spin-parity, spectroscopic factor (relative).

1962Cu07: 4.5 mg/cm^2 thick ^{31}P target, E_d=15 MeV; magnetic spectrometer, CsI crystal; deduced spectroscopic factors.

1974Ma34: ^{31}P(d,^{3}He), E(^{3}He)=52 MeV; four ΔE-E telescopes consisting of cooled surface barrier counter; measured σ(E(^{3}He),θ); deduced L, S. FWHM=120 keV.

^{30}Si Levels

E(level)[†]	J^{π}[#]	L[&]	C^2S[@]	Comments
0	0^+	0	1.0	$\sigma_{exp}(25°)$=2.64 mb/sr; ≈S_{exp}=1.42 (1962Cu07); C^2S=0.62 (1974Ma34); C^2S=0.77 *12* (1988Bh09 – uncertainty from footnote).
2240 *5*	2^+	2	1.6	$\sigma_{exp}(20°)$=0.55 mb/sr; ≈S_{exp}=0.35 for $1d_{3/2}$ and 1.23 for $1d_{5/2}$ (1962Cu07); C^2S=0.34+0.57 for $d_{5/2}+d_{3/2}$ (1974Ma34); C^2S=1.78 *36* (1988Bh09 – from 1.40 for $d_{5/2}$ and 0.38 for $d_{3/2}$).
3492 *5*	2^+	2	0.67	C^2S: other: 0.27+0.04 for $d_{5/2}+d_{3/2}$ (1974Ma34); C^2S=1.03 *20* (1988Bh09 – from 0.97 for $d_{5/2}$ and 0.05 for $d_{3/2}$).
3772 *10*	$1^{(+)},0^+$	0	0.04	E(level): doublet. C^2S: other: 0.03 (1974Ma34).
4823 *10*	2^+	2,(0)	0.29	C^2S: (<0.05) for (0); 0.13+0.01 for $d_{5/2}+d_{3/2}$ for doublet (1974Ma34).
5225 *10*	$(3)^+$	2	2.2	J^{π}: Proposed in 1968Wi19, based on $1^+,2^+,3^+$ from L=2 and 3^+ from shell model predictions. 3^+ in the Adopted Levels. C^2S: other: 0.98 (1974Ma34).
5370 *10*	0^+	0	0.18	C^2S: other: 0.14 (1974Ma34).
5605 *10*	2^+	2	0.57	
5620[‡] *25*	2^+	2[‡]		C^2S: other: 0.23 (1974Ma34).
6550[‡] *25*	2^+	2[‡]		C^2S: other: 0.25 (1974Ma34).
6870[‡] *25*	(3^+)	2[‡]		J^{π}: from large spectroscopic factor and the shape of the angular distribution, 1974Ma34 suggest 3^+. C^2S: other: 0.59 (1974Ma34).
7080[‡] *25*	$(1,3)^+$	2[‡]		J^{π}: 2^- was excluded from $(1^+,2^-,3^+)$ in 1974Ma34, based on measured L=2. C^2S: other: 0.22 (1974Ma34).
7260[‡] *25*	2^+	2[‡]		C^2S: other: 0.12 (1974Ma34).
7440[‡] *25*	0^+	2[‡]		J^{π}: L=2 is not consistent with $J^{\pi}=0^+$ in the Adopted Levels. C^2S: other: <0.06 (1974Ma34).
7660[‡] *25*		2[‡]		C^2S: other: 0.37 (1974Ma34).
8140[‡] *25*		2[‡]		C^2S: other: 0.27 (1974Ma34).
8780[‡] *25*		2[‡]		C^2S: other: 0.14 (1974Ma34).
8920[‡] *25*		2[‡]		C^2S: other: 0.15 (1974Ma34).
9240[‡] *25*		2[‡]		C^2S: other: 0.18 (1974Ma34).

[†] From 1968Wi19, except otherwise noted.

[‡] From 1974Ma34. Authors suggest the uncertainty of the excitation energy from 5-25 keV. Evaluators list 25 keV for all.

[#] As listed in 1968Wi19 (Table 1) from the literature for levels up to 5605, for higher levels from 1974Ma34. Proposed assignments and arguments from the work of 1968Wi19 and 1974Ma34 are noted in the comments.

[@] Relative value from 1968Wi19. In 1962Cu07, $\sigma_{exp}/(C^2\sigma_{calc})$, as ≈$S_{exp}$, values are reported for the g.s., first excited state –

Continued on next page (footnotes at end of table)

^{31}P(d,^{3}He) 1968Wi19,1962Cu07,1974Ma34 (continued)

^{30}Si Levels (continued)

listed in the comments, also those C^2S from 1974Ma34 in the comments (appears to be absolute value).
& From 1968Wi19, except where otherwise noted.