^{20}Ne(α,p) 1979Bi04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171,1 (2021)	1-Jun-2020

Target: Enriched ^{20}Ne in a gas cell at 200-300 Torr pressure at the center of a scattering chamber; Projectile: Momentum-analyzed α beam, E=39.5 MeV; outgoing particles were detected by ΔE-E Si counter telescope; Measured σ(Ep,θ); Deduced excitation energy and differential cross section. DWBA analysis. FWHM ~100 keV.

^{23}Na Levels

Integral cross section (dσ/dΩ) c.m. over the angular range corresponding to θ_{lab}=7°−70°.

E(level)[†]	J$^\pi$[&]	C$_{exp}$[a]	Comments
0.0	3/2$^+$	12	(dσ/dΩ)$_{int}$=1.0 mb/sr.
0.44×10^3 *2*	5/2$^+$	50	(dσ/dΩ)$_{int}$=4.7 mb/sr.
2.07×10^3 *2*	7/2$^+$	6.7	(dσ/dΩ)$_{int}$=0.8 mb/sr.
2.38×10^3 *2*	1/2$^+$	102	(dσ/dΩ)$_{int}$=3.4 mb/sr.
2.68×10^3[‡] *2*	9/2$^+$	≈10	(dσ/dΩ)$_{int}$=2.4 mb/sr.
2.97×10^3 *2*	3/2$^+$	88	(dσ/dΩ)$_{int}$=5.7 mb/sr.
3.87×10^3[‡] *2*			(dσ/dΩ)$_{int}$=1.0 mb/sr. J$^\pi$,C$_{exp}$: 1/2$^+$ and 3/2$^+$; (29) and (10).
4.40×10^3 *10*	1/2$^+$	≈5	(dσ/dΩ)$_{int}$~0.2 mb/sr.
4.77×10^3 *2*	7/2$^+$	18	(dσ/dΩ)$_{int}$=1.6 mb/sr.
5.37×10^3 *2*	5/2$^+$	14	(dσ/dΩ)$_{int}$=1.5 mb/sr. E(level): 1979Bi04 list as doublet − no other level within the range in Adopted Levels.
5.75×10^3[#] *2*	(5/2$^+$,7/2$^+$)	12	(dσ/dΩ)$_{int}$=1.3 mb/sr. C$_{exp}$: 13 for 7/2$^+$.
6.24×10^3 *2*	13/2$^+$	30	(dσ/dΩ)$_{int}$=2.2 mb/sr.
6.33×10^3[‡] *2*	1/2$^+$	≤20	(dσ/dΩ)$_{int}$=2.4 mb/sr.
6.58×10^3 *2*	9/2$^+$	39	(dσ/dΩ)$_{int}$=5.6 mb/sr.
6.91×10^3 *3*	3/2$^+$	23	(dσ/dΩ)$_{int}$=5.3 mb/sr. C$_{exp}$: The 3/2$^+$ part of 3/2$^-$, 3/2$^+$ least-squares fit of known doublet. 67 for 3/2$^-$ (Table 4).
7.12×10^3[#] *3*		18	(dσ/dΩ)$_{int}$=2.5 mb/sr. J$^\pi$,C$_{exp}$: (5/2$^+$) and (9/2$^+$) − uncertain. Note it is a triplet. C$_{exp}$ =15 for (9/2$^+$).
7.27×10^3 *2*	13/2$^+$	40	(dσ/dΩ)$_{int}$=4.0 mb/sr.
7.45×10^3[‡] *2*		50	(dσ/dΩ)$_{int}$=7.2 mb/sr. J$^\pi$: 9/2$^+$ for doublet in 1979Bi04. (3/2$^+$,5/2$^+$) for 7451 in Adopted Levels.
7.71×10^3 *3*			(dσ/dΩ)$_{int}$=13 mb/sr for 7.71×10^3 and 7.81×10^3.
7.81×10^3[‡] *3*			
7.97×10^3[@] *3*	7/2$^+$	15	(dσ/dΩ)$_{int}$=1.4 mb/sr.
8.30×10^3[‡] *2*	(9/2$^+$,13/2$^+$)	20	(dσ/dΩ)$_{int}$=2.8 mb/sr. C$_{exp}$: 31 for 13/2$^+$. 18 for 7/2$^-$ (in Table 4).
8.45×10^3[‡@] *3*			(dσ/dΩ)$_{int}$=2.4 mb/sr. J$^\pi$: 13/2$^+$ in Fig. 5.
8.93×10^3 *3*			(dσ/dΩ)$_{int}$=2.4 mb/sr.
9.10×10^3 *2*	13/2$^+$	123	(dσ/dΩ)$_{int}$=12 mb/sr.
9.36×10^3 *3*	(9/2$^+$,13/2$^+$)	15	(dσ/dΩ)$_{int}$=2.4 mb/sr. C$_{exp}$: 24 for 13/2$^+$.
9.66×10^3[@] *3*	13/2$^+$	26	(dσ/dΩ)$_{int}$=2.6 mb/sr.
9.95×10^3 *2*			(dσ/dΩ)$_{int}$=9.3 mb/sr.

Continued on next page (footnotes at end of table)

^{20}Ne(α,p) 1979Bi04 (continued)

^{23}Na Levels (continued)

E(level)[†]	J$^{\pi}$[&]	C$_{exp}$[a]	Comments
10.45×10^3[@] 3	(5/2$^+$,9/2$^+$)	29	(dσ/dΩ)$_{int}$=3.6 mb/sr. C$_{exp}$: 22 for 9/2$^+$.
10.69×10^3[@] 3	13/2$^+$	25	(dσ/dΩ)$_{int}$=2.5 mb/sr.
10.94×10^3[@] 2	(9/2$^+$,13/2$^+$)	27	(dσ/dΩ)$_{int}$=4.0 mb/sr. C$_{exp}$: 38 for 13/2$^+$.
11.25×10^3[‡@] 2	13/2$^+$	143	(dσ/dΩ)$_{int}$=15 mb/sr. C$_{exp}$: 125 for 15/2$^-$ (in Table 4).
11.43×10^3[@] 4			(dσ/dΩ)$_{int}$=3.5 mb/sr.
11.55×10^3[#@] 2			(dσ/dΩ)$_{int}$=5.3 mb/sr.
11.72×10^3 2	13/2$^+$	53	(dσ/dΩ)$_{int}$=5.9 mb/sr.
11.92×10^3 3			(dσ/dΩ)$_{int}$=2.9 mb/sr.
12.13×10^3 3			(dσ/dΩ)$_{int}$=2.9 mb/sr.
12.27×10^3 3	(7/2$^+$,9/2$^+$)	≈40	(dσ/dΩ)$_{int}$=4.7 mb/sr. C$_{exp}$: 34 for 9/2$^+$.
12.49×10^3 3	(13/2$^+$)	33	(dσ/dΩ)$_{int}$=4.0 mb/sr. C$_{exp}$: 34 for 9/2$^+$. 29 and 36 for 15/2$^-$ and 13/2$^-$, respectively (Table 4).
12.78×10^3 4	(9/2$^+$)	35	(dσ/dΩ)$_{int}$=4.6 mb/sr. C$_{exp}$: 37 for 15/2$^-$ (in Table 4).
12.85×10^3[@] 4	(13/2$^+$)	55	(dσ/dΩ)$_{int}$=5.9 mb/sr. C$_{exp}$: 45 for 15/2$^-$ (in Table 4).
13.18×10^3[@] 4			(dσ/dΩ)$_{int}$=5.8 mb/sr.
13.33×10^3 4			(dσ/dΩ)$_{int}$=5.4 mb/sr.
13.56×10^3 4			(dσ/dΩ)$_{int}$=4.3 mb/sr.
13.68×10^3 3			(dσ/dΩ)$_{int}$=6.8 mb/sr.
13.97×10^3 3			(dσ/dΩ)$_{int}$=7.1 mb/sr.
14.26×10^3 4			(dσ/dΩ)$_{int}$=3.9 mb/sr.
14.41×10^3 4			(dσ/dΩ)$_{int}$=6.0 mb/sr.
14.65×10^3 5			(dσ/dΩ)$_{int}$=(3) mb/sr.
14.77×10^3 5			(dσ/dΩ)$_{int}$=(4) mb/sr.
14.91×10^3 5			(dσ/dΩ)$_{int}$=(7) mb/sr.
14.99×10^3 5			(dσ/dΩ)$_{int}$=(3) mb/sr.
15.26×10^3 5			(dσ/dΩ)$_{int}$=(3) mb/sr.
15.52×10^3 5			(dσ/dΩ)$_{int}$=(4) mb/sr.
15.61×10^3 5			(dσ/dΩ)$_{int}$=(4) mb/sr.

[†] From 1979Bi04.
[‡] Doublet.
[#] Triplet (1979Bi04), not referenced in the Adopted Levels.
[@] Overlaps more than two levels – not referenced in Adopted Levels.
[&] From (dσ/dΩ) (θ) and DWBA calculations.
[a] C$_{exp}$=(dσ/dΩ)$_{exp}$/(dσ/dΩ)$_{DWUCK}$. For two possible spins, listed value in column for the 1st and in comments for the 2nd spin. Some other C$_{exp}$ values are given in Table 4. Evaluators list only the one′s for levels also given in Table 3.