^{22}Ne(n,γ) E=thermal 2009BeZQ,1986Pr05

History

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

Others: 1986Pr05, 1971Be34, 1970Se14, 2005ReZY (private communication).

2009BeZQ: Target – 99.87% enriched ^{22}Ne gas. The experiment was carried out at the PGAA facilities of II-HAS at the Budapest Research Reactor. The de-exciting gamma rays were detected using a BGO-shielded HPGe detector. Measured Eγ, Iγ. 2005ReZY is an earlier work at the same facility of 2009BeZQ.

1986Pr05: Target – natural neon gas (purity 99.99%). Measured Eγ, Iγ with a high resolution pair spectrometer. Reported five γ rays, all are present in 2009BeZQ.

1971Be34: Target – natural neon gas (70% + 30% helium) target. The experiment was performed at the research reactor FRG 1 in Geesthacht. Measured Eγ, Iγ with a Ge(Li) detector. Reported twelve γ rays, nine of those are present in 2009BeZQ. The other three γ rays are not reported in 1970Se14.

1970Se14: Natural neon gas target. Experiment was performed at the 1 MW heavy water reactor in Stockholm. Measured Eγ, Iγ with a Ge(Li) detector. Reported twenty two γ rays, seven of those are present in 2009BeZQ.

Measured thermal neutron capture cross section 52.7 mb *7* (2009BeZQ, 2018MuZY).

Data from 2009BeZQ, 99.87% enriched ^{22}Ne gas target. γ-ray energies from 1986Pr05 are also considered.

^{23}Ne Levels

E(level)[†]	J$^\pi$[‡]
0.0	5/2$^+$
1016.901 *20*	1/2$^+$
1822.15 *5*	3/2$^+$
3220.52 *5*	3/2$^-$
3458.30 *8*	(1/2,3/2,5/2$^+$)
3836.13 *6*	1/2$^-$
(5200.44 *6*)	1/2$^+$

[†] From least-squares fit of γ-ray energies.
[‡] From Adopted Levels.

γ(^{23}Ne)

Iγ normalization: From 100/σ, where σ=52.7 mb *7*. ΣIγ (g.s.) = 100 yields 1.919 *12*.

E$_\gamma$[†]	I$_\gamma$[‡#]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
377.64 *16*	0.04 *1*	3836.13	1/2$^-$	3458.30	(1/2,3/2,5/2$^+$)	E$_\gamma$: 377.64 *16* (2009BeZQ).
615.80 *13*	0.19 *4*	3836.13	1/2$^-$	3220.52	3/2$^-$	E$_\gamma$: 615.81 *13* (2009BeZQ).
1016.88 *2*	38.57 *29*	1016.901	1/2$^+$	0.0	5/2$^+$	E$_\gamma$: 1016.90 *2* (2009BeZQ).
1364.30 *4*	9.82 *10*	(5200.44)	1/2$^+$	3836.13	1/2$^-$	E$_\gamma$: 1364.34 *4* (2009BeZQ).
1398.40 *6*	1.37 *5*	3220.52	3/2$^-$	1822.15	3/2$^+$	E$_\gamma$: 1398.45 *6* (2009BeZQ).
1635.99 *10*	0.62 *5*	3458.30	(1/2,3/2,5/2$^+$)	1822.15	3/2$^+$	E$_\gamma$: 1636.05 *10* (2009BeZQ).
1742.06 *10*	0.56 *5*	(5200.44)	1/2$^+$	3458.30	(1/2,3/2,5/2$^+$)	E$_\gamma$: 1742.13 *10* (2009BeZQ).
1822.11 *6*	7.21 *9*	1822.15	3/2$^+$	0.0	5/2$^+$	E$_\gamma$: 1822.19 *6* (2009BeZQ).
1979.86 *6*	39.31 *34*	(5200.44)	1/2$^+$	3220.52	3/2$^-$	E$_\gamma$: Weighted ave. of 1979.83 *6* (2009BeZQ – 1979.92 *6*) and 1979.89 *6* (1986Pr05). Uncertainty lowest input value.
2013.94 *7*	4.76 *7*	3836.13	1/2$^-$	1822.15	3/2$^+$	E$_\gamma$: 2014.03 *7* (2009BeZQ).
2203.55 *6*	32.29 *29*	3220.52	3/2$^-$	1016.901	1/2$^+$	E$_\gamma$: Weighted ave. of 2203.51 *7* (2009BeZQ –

Continued on next page (footnotes at end of table)

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γ(^{23}Ne) (continued)

E_γ [†]	I_γ [‡#]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						2203.62 *7*) and 2203.58 *6* (1986Pr05). Uncertainty lowest input value.
2441.38 *29*	0.25 *5*	3458.30	(1/2,3/2,5/2$^+$)	1016.901	1/2$^+$	E_γ: 2441.52 *29* (2009BeZQ).
2819.13 *12*	4.96 *17*	3836.13	1/2$^-$	1016.901	1/2$^+$	E_γ: Weighted ave. of 2819.08 *12* (2009BeZQ – 2819.27 *12*) and 2819.22 *16* (1986Pr05). Uncertainty lowest input value.
3220.25 *12*	6.32 *9*	3220.52	3/2$^-$	0.0	5/2$^+$	E_γ: Weighted ave. of 3220.15 *12* (2009BeZQ – 3220.39 *12*) and 3220.42 *16* (1986Pr05). Uncertainty lowest input value.
3377.71 *18*	0.80 *4*	(5200.44)	1/2$^+$	1822.15	3/2$^+$	E_γ: 3377.98 *18* (2009BeZQ).
4183.01 *18*	1.60 *7*	(5200.44)	1/2$^+$	1016.901	1/2$^+$	E_γ: Weighted ave. of 4182.91 *18* (2009BeZQ – 4183.32 *18*) and 4183.20 *25* (1986Pr05). Uncertainty lowest input value.

[†] From 2009BeZQ, recoil fraction subtracted. Values including recoil in 2009BeZQ are listed in the comments section.
[‡] From 2009BeZQ in units of mb.
[#] For intensity per 100 neutron captures, multiply by 1.897 *25*.

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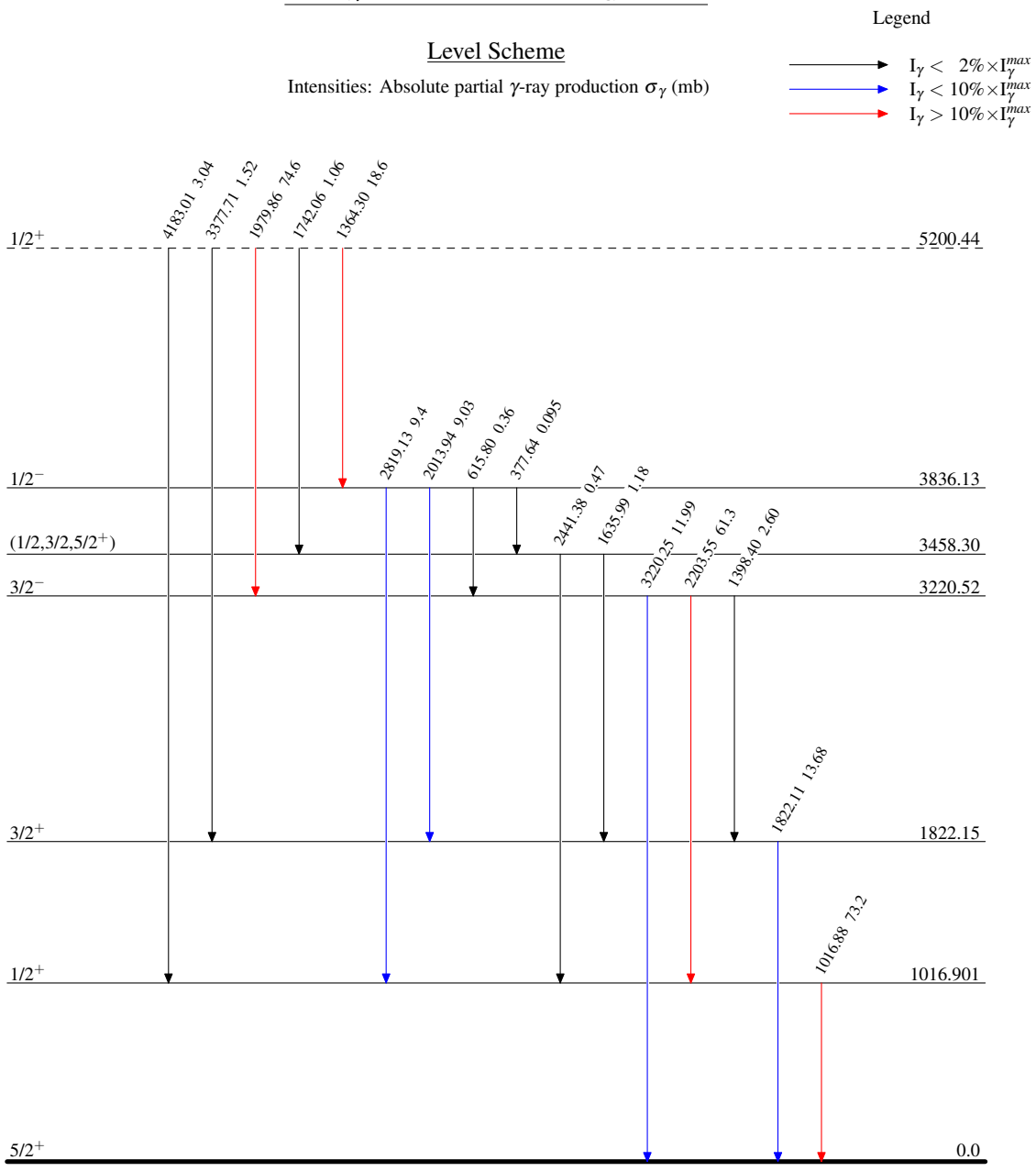
Level Scheme

Intensities: Absolute partial γ-ray production σ_γ (mb)



$^{23}_{10}Ne_{13}$