$^{9}\text{Be}(^{22}\text{Mg},^{23}\text{Mg}\gamma)$ **2011Ga18**

History

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

Based on XUNDL: Compiled by J. Choquette and B. Singh (McMaster), Aug 13, 2011.

The ^{22}Mg beam obtained by fragmentation of ^{24}Mg beam, E=170 MeV/nucleon, bombarding a ^{9}Be target (thickness 1.904 g/cm^2). The A1900 fragment separator at NSCL used to separate ^{22}Mg ions. Secondary ^{22}Mg beam, E=84 MeV/nucleon, bombarded a secondary ^{9}Be (thickness 188 mg/cm^2) and C target (thickness 149.4 mg/cm^2) – placed at the reaction target position of S800 magnetic spectrograph. The target position was surrounded by SeGA array of 32-fold segmented HPGe detectors. Measured Eγ, Iγ, particle spectra (^{23}Mg)γ-coin, cross sections, longitudinal momentum distributions. Particle identification from energy loss and time-of-flight events. Coupled-channel Born approximation (CCBA) reaction analysis.

One-neutron pickup (from ^{12}C) reaction.

Measured partial cross sections are listed in comments.

Inclusive measured cross section=2.40 mb *19* and 2.58 mb *16* for ^{9}Be and C targets, respectively.

^{23}Mg Levels

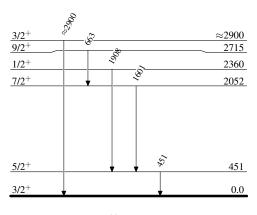| E(level)[†]	J$^{\pi}$[‡]	Comments
0.0	3/2$^+$	$\sigma_f \leq$0.86 mb *+8−11* and <0.77 mb *+9−13* for ^{9}Be and C targets, respectively. Configuration=0$^+$⊗1d$_{3/2}$ or 2$^+$⊗1d$_{5/2}$.
451	5/2$^+$	σ_f=1.32 mb *12* and 1.27 mb *14* for ^{9}Be and C targets, respectively. Configuration=0$^+$⊗1d$_{5/2}$.
2052	7/2$^+$	σ_f=0.15 mb *4* and 0.18 mb *5* for ^{9}Be and C targets, respectively. Configuration=2$^+$⊗1d$_{5/2}$.
2360	1/2$^+$	σ_f=0.13 mb *4* and 0.08 mb *5* for ^{9}Be and C targets, respectively. Configuration=0$^+$⊗2s$_{1/2}$.
2715	9/2$^+$	σ_f=0.13 mb *4* and 0.10 mb *5* for ^{9}Be and C targets, respectively. Configuration=2$^+$⊗1d$_{5/2}$.
≈2900	3/2$^+$	Configuration=0$^+$⊗1d$_{3/2}$.

[†] From γ-ray energies.

[‡] From 2011Ga18 based on comparison of measured neutron pickup cross section and CCBA calculations.

$\gamma(^{23}\text{Mg})$

E$_\gamma$	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$
451	451	5/2$^+$	0.0	3/2$^+$
663	2715	9/2$^+$	2052	7/2$^+$
1601	2052	7/2$^+$	451	5/2$^+$
1908	2360	1/2$^+$	451	5/2$^+$
≈2900	≈2900	3/2$^+$	0.0	3/2$^+$

^{9}Be(^{22}Mg,^{23}Mgγ)   2011Ga18

Level Scheme

$^{23}_{12}Mg_{11}$

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