## $^{24}$Mg(d,$^{2}$He) 1995Xu02,2002Ra12

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | M. Shamsuzzoha Basunia, Anagha Chakraborty | NDS 186, 2 (2022) | 31-Mar-2022 |

Other: 2002Ra15.

1995Xu02: The experiment was performed using 125.2 MeV deuteron beams from the Texas A&M University K500 superconducting cyclotron. Self-supporting $^{24}$Mg targets having 1.95 mg/cm$^2$ thickness were used. The Texas A&M Proton Spectrometer was used to detect the correlated protons from $^{2}$He decay. Measured differential cross-sections.

2002Ra12: The reaction $^{24}$Mg(d,$^{2}$He), E=170 MeV was used. The 170 MeV deuteron beams were delivered by the AGOR cyclotron. The detection system was comprised of two vertical drift chambers and a tracking detector of a set of four multiwire proportional chambers. The detection system was placed near the focal plane of the Big-Bite Spectrometer (BBS). Self-supporting target of $^{24}$Mg having a thickness of 7 mg/cm$^2$ and 99.9% enrichment was used. Measured excitation energy spectra, differential cross-sections. Deduced Gamow-Teller matrix elements. Performed DWBA analysis.

### $^{24}$Na Levels

| E(level)† | Jπ‡ | Comments |
|---|---|---|
| 472.2 | 1$^+$ | σ=0.08 mb/sr *4* (1995Xu02), dσ/dΩ=0.138 mb/sr *12* (2002Ra12).<br>B(GT$^+$)=0.049 *4 3* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 1346.6 | 1$^+$ | σ=0.84 mb/sr *6* (1995Xu02), dσ/dΩ=1.563 mb/sr *85* (2002Ra12).<br>B(GT$^+$)=0.654 *35 42* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 1885.5 | | dσ/dΩ=0.087 mb/sr *26* (2002Ra12).<br>Jπ: 1$^+$ in 2002Ra12 (dσ/dΩ and DWBA are not shown in fig). 3$^+$ in Adopted Levels.<br>B(GT$^+$)=0.025 *8 2* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 3413.3 | 1$^+$ | dσ/dΩ=0.667 mb/sr *39* (2002Ra12).<br>B(GT$^+$)=0.290 *16 18* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 3589.3 | 1$^+$ | σ=0.52 mb/sr *5* (1995Xu02). The quoted value includes the combined scattering effect from 3413-keV and 3589-keV level. $dσ/dΩ=0.266 mb/sr *18* (2002Ra12).<br>B(GT$^+$)=0.095 *6 6* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 3933.6 | | Jπ: 1$^+$ in 2002Ra12 (dσ/dΩ and DWBA are not shown in fig). (1$^+$, 2$^+$, 3) in Adopted Levels.<br>dσ/dΩ=0.193 mb/sr *58* (2002Ra12).<br>B(GT$^+$)=0.070 *22 4* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 5059.6 | | Jπ: 1$^+$ in 2002Ra12 (dσ/dΩ and DWBA are not shown in fig). (3)$^-$ in Adopted Levels.<br>dσ/dΩ=0.093 mb/sr *27* (2002Ra12).<br>B(GT$^+$)=0.024 *7 2* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 6247.5 | | Jπ: 1$^+$ in 2002Ra12 (dσ/dΩ and DWBA are not shown in fig). (2$^+$,3$^+$) in Adopted Levels.<br>dσ/dΩ=0.086 mb/sr *26* (2002Ra12).<br>B(GT$^+$)=0.031 *10 2* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 6715 | 1$^+$ | Jπ: from 2002Ra12.<br>dσ/dΩ=0.161 mb/sr *12* (2002Ra12).<br>B(GT$^+$)=0.071 *5 4* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |
| 7200 | 1$^+$ | Jπ: from 2002Ra12.<br>dσ/dΩ=0.173 mb/sr *13* (2002Ra12).<br>B(GT$^+$)=0.050 *4 3* (2002Ra12) (first and second uncertainty corresponds respectively to statistical and systematic). |

† From Adopted Levels, rounded value to one-tenth of a keV.

‡ From Adopted Levels, except where otherwise noted.