## $^{2}$H($^{86}$Kr,p) 2013Sh02,2012ShZZ

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | T. D. Johnson and W. D. Kulp(a) | NDS 129, 1 (2015) | 27-Jul-2015 |

E=10 MeV/nucleon $^{86}$Kr beam from Argonne Tandem-Linac Accelerator System (ATLAS). Target=50-75 $\mu$g/cm$^2$ $(C_2D_4)_n$. Measured proton spectra, $\sigma(\theta)$ using the Helical-Orbit Spectrometer (HELIOS). FWHM ≈ 80 keV. Deduced levels, and spectroscopic factors. DWBA analysis.

Uncertainties quoted for cross sections are purely statistical. There is additional systematic uncertainty of ≈20%.

Cross sections (dσ/dΩ mb/sr) from (d,p) data (2012ShZZ)
Angle θ is in degrees in c.m. system

| Level | $\sigma_1$ | $\theta_1$ | $\sigma_2$ | $\theta_2$ | $\sigma_3$ | $\theta_3$ |
|---|---|---|---|---|---|---|
| 0 | 12.01 *25* | 19.3 | 5.80 *18* | 23.6 | 5.52 *10* | 27.3 |
| 538 *7* | 1.61 *11* | [17.1] | 1.00 *8* | 22.0 | 1.79 *6* | 25.9 |
| 1465 *5* | | | 1.75 *11* | 18.6 | 2.09 *7* | 23.3 |
| 1570 *3* | | | 0.18 *6* | 18.4 | 0.19 *4* | 23.1 |
| 1883 *8* | | | | 0.30 *5* | | 22.0 |
| 1997 *5* | | | | 1.13 *7* | | 21.5 |
| 2080 *2* | | | | 0.61 *15* | | 21.2 |
| 2112 *2* | | | | 5.99 *16* | | 21.2 |
| 2250 *2* | | | | 1.26 *9* | | 21.0 |
| 2277 *2* | | | | 0.17 *10* | | 21.0 |
| 2517 *4* | | | | 2.96 *8* | | 19.6 |
| 2775 *3* | | | | 0.58 *10* | | 18.6 |
| 2823 *3* | | | | 2.86 *12* | | 18.3 |
| 3021 *5* | | | | 1.80 *8* | | 17.5 |
| 3229 *16* | | | | 0.41 *6* | | 16.4 |

Cross sections (dσ/dΩ mb/sr) from (d,p) data (2012ShZZ)
Angle θ is in degrees in c.m. system

| Level | $\sigma_4$ | $\theta_4$ | $\sigma_5$ | $\theta_5$ | $\sigma_6$ | $\theta_6$ |
|---|---|---|---|---|---|---|
| 0 | 3.14 *9* | 30.5 | 1.78 *16* | 33.4 | 2.30 *11* | 36.1 |
| 538 *7* | 1.12 *7* | 29.3 | 1.14 *14* | 32.4 | 1.12 *10* | 35.2 |
| 1465 *5* | 1.01 *7* | 27.1 | 0.67 *15* | 27.1 | 0.75 *9* | 33.4 |
| 1570 *3* | 0.19 *6* | 26.9 | 0.50 *14* | 30.3 | 0.22 *8* | 33.3 |
| 1883 *8* | 0.17 *5* | 26.0 | 0.07 *9* | 29.6 | 0.14 *7* | 32.6 |
| 1997 *5* | 0.56 *6* | 25.7 | 0.57 *16* | 29.2 | 0.55 *9* | 32.3 |
| 2080 *2* | 0.69 *13* | 25.4 | 0.26 *37* | 28.9 | 0.39 *20* | 32.1 |
| 2112 *2* | 2.85 *14* | 25.4 | 1.60 *33* | 28.9 | 1.62 *18* | 32.1 |
| 2250 *2* | 1.04 *17* | 25.0 | 1.13 *13* | 29.0 | 0.84 *15* | 32.0 |
| 2277 *2* | 0.16 *13* | 25.0 | 0.12 *12* | 29.0 | 0.15 *12* | 32.0 |
| 2517 *4* | 2.17 *9* | 24.2 | 2.17 *14* | 27.9 | 2.13 *10* | 31.2 |
| 2775 *3* | 0.41 *9* | 23.3 | 0.07 *18* | 27.2 | 0.17 *12* | 30.6 |
| 2823 *3* | 1.15 *7* | 22.5 | 1.01 *11* | 26.6 | 0.63 *7* | 30.0 |
| 3021 *5* | 1.15 *7* | 22.5 | 1.01 *11* | 26.6 | 0.63 *7* | 30.0 |
| 3229 *16* | 0.22 *5* | 21.7 | 0.35 *9* | 25.9 | 0.39 *5* | 29.5 |

## $^{2}$H($^{86}$Kr,p) 2013Sh02,2012ShZZ (continued)

### $^{87}$Kr Levels

| E(level)† | L‡ | C$^2$S# | E(level)† | L‡ | C$^2$S# | E(level)† | L‡ | C$^2$S# | E(level)† | L‡ | C$^2$S# |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 2 | 1.02 | 1883 *8* | 2 | 0.030 | 2250 *2* | (5) | 0.75 | 2823 *3* | 2 | 0.18 |
| 538 *7* | 0 | 0.69 | 1997 *5* | 2 | 0.11 | 2277 *2* | (0) | 0.094 | 3021 *5* | 2 | 0.12 |
| 1465 *5* | 2 | 0.19 | 2080 *2* | 0 | 0.19 | 2517 *4* | 4 | 0.96 | 3229 *16* | (0+2) | 0.13 |
| 1570 *3* | (0) | 0.17 | 2112 *2* | 2 | 0.47 | 2775 *3* | 2 | 0.041 | | | |

† Uncertainties are from 2012ShZZ. In 2013Sh02, the authors quote values to just three digits (in MeV) and state that the estimated uncertainty is ≈10 keV. It is possible that uncertainties quoted in 2012ShZZ are statistical, and the ≈10 keV is the systematic uncertainty. A comparison with Adopted Levels indicates that the energies of 2012ShZZ are about 8 keV low and this shift is taken into account when making level associations in Adopted Levels.

‡ The values are from 1970Ha16 in (d,p) with the tentative L(1873)=(2) and L(2080)=(0) from (d,p) being confirmed.

# For the DWBA calculation for L=2, the values are for $J^{\pi}=3/2^{+}$, except for the ground state; for L=4 $J^{\pi}$ is taken to be $7/2^{+}$; and for L=5 $J^{\pi}$ is taken to be $11/2^{-}$. For the 3229 keV level, C$^2$S is for $1/2^{+}$. C$^2$S=0.004 for $3/2^{+}$ and 0.003 for $5/2^{+}$.