## $^{36}$Ar(d,p$\gamma$) 1971Ch09,1971ChZI

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | John Cameron, Jun Chen and Balraj Singh, Ninel Nica | NDS 113, 365 (2012) | 15-Jan-2012 |

1971Ch09: E=2.800, 2.975, 3.100 MeV, used enriched gas target and Ge(Li) detector. Measured $\gamma$-ray spectra At 0° and 90°, P-$\gamma(\theta)$, and Doppler shifts; deduced E$\gamma'$s, I$\gamma'$s, level scheme, and J values.
1971ChZI: same As 1971Ch09 plus proton angular distribution measurements and DWBA analysis (see $^{36}$Ar(d,p) dataset).

### $^{37}$Ar Levels

| E(level)† | J$^\pi$‡ | $T_{1/2}$# | E(level)† | J$^\pi$‡ | $T_{1/2}$# | E(level)† | J$^\pi$‡ | $T_{1/2}$# |
|---|---|---|---|---|---|---|---|---|
| 0 | 3/2$^+$@ | | 2490.6 *13* | (3/2) | <30 ps | 3273.4 *16* | 5/2,(3/2) | <30 ps |
| 1408.8 *15* | 1/2$^+$@ | <30 ps | 2796.3 *18* | 5/2,1/2 | <30 ps | 3516.1 *18* | 3/2 | <30 ps |
| 1611.2 *8* | 5/2,7/2 | | 3171.3 *17* | 5/2,(3/2) | <30 ps | 3526.1 *21* | (7/2) | <30 ps |
| 2218.2 *15* | 5/2,7/2 | <30 ps | 3186.4 *17* | | <30 ps | 3607.7 *29* | 3/2,5/2 | <30 ps |

† From 1971Ch09.
‡ ADOPTED by evaluators based on multipolarities resulting from $\gamma(\theta)$ measurements of 1971Ch09 (In the paper J$^\pi$ values are adopted including the L values from 1971ChZI, which are considered by evaluators In the separate $^{36}$Ar(d,p) dataset).
# Upper limit according to 1971Ch09 valid for all levels, except for longer-lived 1611 level.
@ From Adopted Levels.

### $\gamma(^{37}$Ar)

| $E_i$(level) | $J_i^\pi$ | $E_\gamma$† | $I_\gamma$ | $E_f$ | $J_f^\pi$ | Mult.‡ | $\delta$ | Comments |
|---|---|---|---|---|---|---|---|---|
| 1408.8 | 1/2$^+$ | 1409 | 100 | 0 | 3/2$^+$ | | | |
| 1611.2 | 5/2,7/2 | 1611 | 100 | 0 | 3/2$^+$ | Q+O | −0.15 *4* | Mult.,$\delta$: or −4.1 *5* for J=7/2, +1.0 *2* or +4.7 *17* for J=5/2;<br>$A_2$=+0.28 *1*, $A_4$=−0.24 *2*; $\gamma(\theta)$ possibly perturbed by long lifetime. |
| 2218.2 | 5/2,7/2 | 2218 | 100 | 0 | 3/2$^+$ | Q(+D) | | Mult.,$\delta$: +0.85 *20* or +4.4 *16* for J=5/2, −0.05 *3* or =6.5 *10* for J=7/2;<br>$A_2$=+0.34 *2*, $A_4$=−0.14 *2*. |
| 2490.6 | (3/2) | 879 | 9 *2* | 1611.2 | 5/2,7/2 | | | |
| | | 2491 | 91 *2* | 0 | 3/2$^+$ | D(+Q) | | Mult.,$\delta$: compatible with $\Delta$J=0 transition.<br>$A_2$=+0.12, $A_4$=−0.03 *2*, |
| 2796.3 | 5/2,1/2 | 2796 | 100 | 0 | 3/2$^+$ | D(+Q) | 0.00 *15* | Mult.,$\delta$: or −8.0 *15* for J=5/2; compatible with $\Delta$J=1 transition (1971Ch09 also considered $\Delta$J=0 possibility, which however seems less likely based on $A_2$,$A_4$).<br>$A_2$=−0.04 *2*, $A_4$=−0.03 *2*. |
| 3171.3 | 5/2,(3/2) | 3171 | 100 | 0 | 3/2$^+$ | D+Q | −0.3 *3* | Mult.,$\delta$: or −1.6 *3* for J=5/2, −1.4 *5* or +1.4 *13* for J=3/2; the $\Delta$J=0 possibility seems less likely based on $A_2$,$A_4$.<br>$A_2$=−0.54 *2*, $A_4$=0.00 *2*. |
| 3186.4 | | 1575 | 100 | 1611.2 | 5/2,7/2 | | | |
| 3273.4 | 5/2,(3/2) | 783 | | 2490.6 | (3/2) | | | |
| | | 1662 | 40 *5* | 1611.2 | 5/2,7/2 | | | |
| | | 3273 | 60 *5* | 0 | 3/2$^+$ | D+Q | −0.20 *25* | Mult.,$\delta$: or −2.7 *5* for J=5/2$^+$, 2.3 *20* or −2.1 *16* for J=3/2; the $\Delta$J=0 possibility seems less likely based on $A_2$,$A_4$.<br>$A_2$=−0.20 *3*, $A_4$=−0.03 *3*. |
| 3516.1 | 3/2 | 1026 | 26 *3* | 2490.6 | (3/2) | D(+Q) | | Mult.,$\delta$: compatible with $\Delta$J=0 transition.<br>$A_2$=+0.28 *8*, $A_4$=+0.03 *9*. |

Continued on next page (footnotes at end of table)

## $^{36}$Ar(d,p$\gamma$) 1971Ch09,1971ChZI (continued)

### $\gamma(^{37}Ar)$ (continued)

| $E_i$(level) | $J_i^\pi$ | $E_\gamma$[†] | $I_\gamma$ | $E_f$ | $J_f^\pi$ | Mult.[‡] | $\delta$ | Comments |
|---|---|---|---|---|---|---|---|---|
| 3516.1 | 3/2 | 2107 | 74 *3* | 1408.8 | 1/2$^+$ | D(+Q) | | Mult.,$\delta$: $\Delta$J=1 transition.<br>$A_2$=−0.37 *2*, $A_4$=−0.02 *1*. |
| 3526.1 | (7/2) | 253 | | 3273.4 | 5/2,(3/2) | | | |
| | | 340 | | 3186.4 | | | | |
| | | 730 | | 2796.3 | 5/2,1/2 | | | |
| | | 1915 | 100 | 1611.2 | 5/2,7/2 | (D+Q) | −4.5 *15* | Mult.,$\delta$: for $J_f$=5/2, and≤−1.0 or≥+25 for $J_f$=5/2;<br>$A_2$=−0.25 *3*, $A_4$=−0.25 *3*. |
| 3607.7 | 3/2,5/2 | 3607 | 100 | 0 | 3/2$^+$ | D+Q | +0.28 *3* | Mult.,$\delta$: for J=5/2, undetermined for J=3/2;<br>$A_2$=+0.05 *2*,$A_4$=−0.04 *2*. |

[†] From 1971Ch09.
[‡] ADOPTED by evaluators based on measured angular distributions of 1971Ch09.

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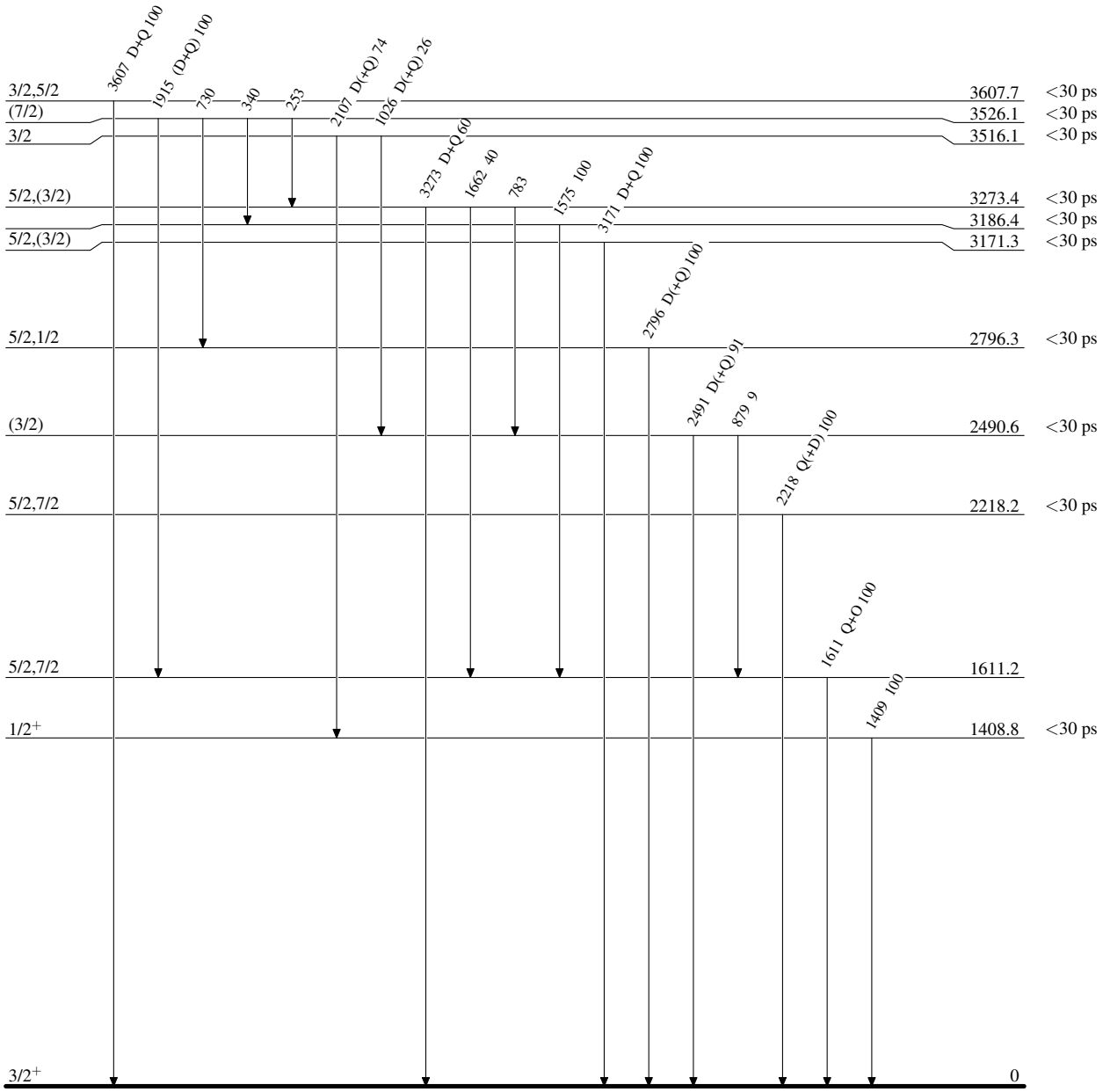
### Level Scheme

Intensities: % photon branching from each level




$^{37}_{18}Ar_{19}$