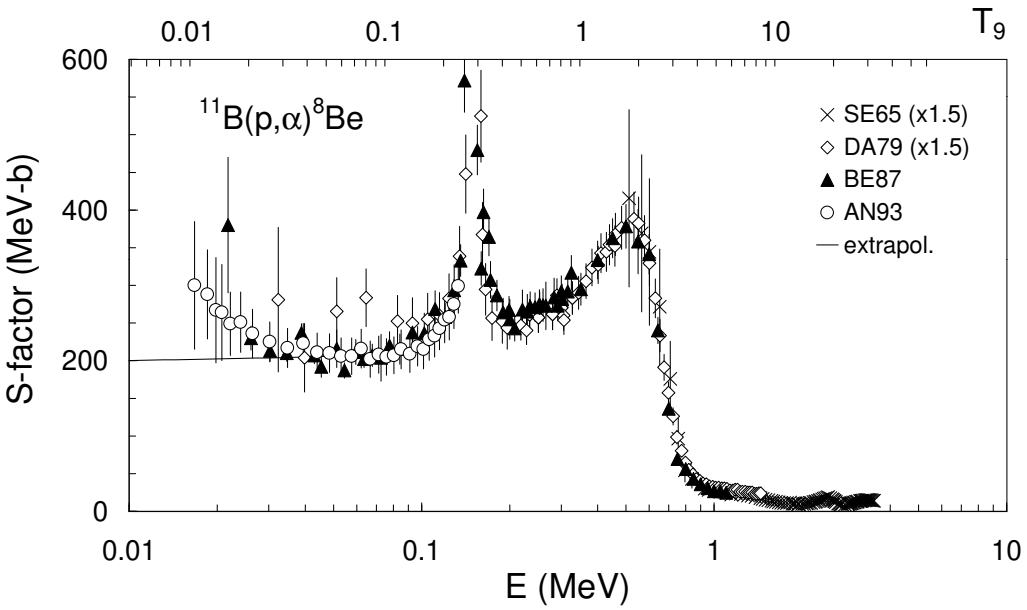
## Reaction : $^{11}$B(p,$\alpha$)2$^4$He

Experimental data from BE87 and AN93 are used for the calculation of the adopted rates and their upper limits. This follows the recommendation of BE87, who show that the reaction proceeds predominantly by a sequential decay, so that the observed yields should be divided by 2 and not by 3, as in SE65 and DA79. The original data from SE65 and DA79 are used for obtaining the lower limits of the rates. The $S$-factor is dominated by a broad resonance structure near 600 keV. A narrow resonance at $E_r = 148.6 \pm 0.4$ keV [AN74, DA79, BE87] is superimposed to this structure (adopted resonance strength $\omega\gamma = 14 \pm 2$ eV [SE61, AN74, DA79]). For the calculation of the reaction rates, data at $E < 60$ keV are corrected for electron screening with $U_e = 430$ eV [BE87, AN93]. For the low energy extrapolation, the recommended "bare" nuclei curve ($S_0 = 187 \pm 30$ MeV b) from AN93 is adopted. Our adopted rates are within about 20% of the CA88 ones at $T_9 < 5$. CA88 used probably the original SE65 and DA79 data sets, and extrapolated to zero energy. The differences are larger at higher $T_9$.




| $T_9$ | low | adopt | high | exp | ratio | $T_9$ | low | adopt | high | exp | ratio | $T_9$ | low | adopt | high | exp | ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.003 | 3.57 | 4.90 | 5.15 | -23 | 1.2 | 0.06 | 4.98 | 7.02 | 7.51 | -1 | 1.2 | 0.7 | 3.96 | 6.76 | 7.54 | 6 | 1.2 |
| 0.004 | 6.25 | 8.68 | 9.12 | -20 | 1.2 | 0.07 | 2.17 | 3.02 | 3.26 | 0 | 1.2 | 0.8 | 0.66 | 1.12 | 1.23 | 7 | 1.1 |
| 0.005 | 1.26 | 1.77 | 1.86 | -17 | 1.2 | 0.08 | 0.72 | 1.01 | 1.10 | 1 | 1.2 | 0.9 | 1.01 | 1.70 | 1.86 | 7 | 1.0 |
| 0.006 | 0.72 | 1.01 | 1.07 | -15 | 1.2 | 0.09 | 1.99 | 2.82 | 3.12 | 1 | 1.3 | 1 | 1.43 | 2.40 | 2.62 | 7 | 0.9 |
| 0.007 | 1.80 | 2.57 | 2.70 | -14 | 1.2 | 0.1 | 4.79 | 6.94 | 7.82 | 1 | 1.2 | 1.25 | 2.75 | 4.59 | 4.99 | 7 | 0.8 |
| 0.008 | 2.57 | 3.69 | 3.88 | -13 | 1.2 | 0.11 | 1.04 | 1.55 | 1.78 | 2 | 1.2 | 1.5 | 4.30 | 7.12 | 7.73 | 7 | 0.8 |
| 0.009 | 2.42 | 3.51 | 3.69 | -12 | 1.2 | 0.12 | 2.08 | 3.19 | 3.76 | 2 | 1.2 | 1.75 | 5.84 | 9.70 | 10.5 | 7 | 0.8 |
| 0.01 | 1.67 | 2.43 | 2.56 | -11 | 1.2 | 0.13 | 3.88 | 6.12 | 7.41 | 2 | 1.2 | 2 | 0.74 | 1.21 | 1.32 | 8 | 0.8 |
| 0.011 | 0.90 | 1.32 | 1.39 | -10 | 1.2 | 0.14 | 0.68 | 1.11 | 1.38 | 3 | 1.1 | 2.5 | 0.99 | 1.64 | 1.77 | 8 | 0.9 |
| 0.012 | 4.00 | 5.91 | 6.22 | -10 | 1.2 | 0.15 | 1.15 | 1.91 | 2.41 | 3 | 1.1 | 3 | 1.18 | 1.97 | 2.14 | 8 | 1.0 |
| 0.013 | 1.51 | 2.26 | 2.37 | -9 | 1.2 | 0.16 | 1.84 | 3.12 | 4.00 | 3 | 1.1 | 3.5 | 1.33 | 2.22 | 2.42 | 8 | 1.1 |
| 0.014 | 5.02 | 7.54 | 7.93 | -9 | 1.2 | 0.18 | 4.20 | 7.36 | 9.64 | 3 | 1.0 | 4 | 1.41 | 2.43 | 2.65 | 8 | 1.2 |
| 0.015 | 1.49 | 2.25 | 2.37 | -8 | 1.2 | 0.2 | 0.85 | 1.51 | 2.00 | 4 | 1.0 | 5 | 1.51 | 2.76 | 3.04 | 8 | 1.3 |
| 0.016 | 4.03 | 6.14 | 6.46 | -8 | 1.2 | 0.25 | 3.27 | 5.95 | 7.87 | 4 | 1.0 | 6 | 1.57 | 3.03 | 3.38 | 8 | 1.4 |
| 0.018 | 2.33 | 3.61 | 3.80 | -7 | 1.2 | 0.3 | 0.87 | 1.60 | 2.07 | 5 | 1.0 | 7 | 1.66 | 3.28 | 3.72 | 8 | 1.5 |
| 0.02 | 1.06 | 1.66 | 1.74 | -6 | 1.2 | 0.35 | 1.89 | 3.42 | 4.30 | 5 | 1.1 | 8 | 1.67 | 3.54 | 4.09 | 8 | 1.6 |
| 0.025 | 2.16 | 3.49 | 3.67 | -5 | 1.2 | 0.4 | 3.55 | 6.36 | 7.79 | 5 | 1.2 | 9 | 1.67 | 3.80 | 4.47 | 8 | 1.8 |
| 0.03 | 2.17 | 3.55 | 3.74 | -4 | 1.2 | 0.45 | 0.61 | 1.08 | 1.29 | 6 | 1.2 | 10 | 1.67 | 4.04 | 4.85 | 8 | 1.9 |
| 0.04 | 0.66 | 1.04 | 1.09 | -2 | 1.2 | 0.5 | 0.98 | 1.70 | 2.00 | 6 | 1.2 | | | | | | |
| 0.05 | 0.77 | 1.13 | 1.20 | -1 | 1.2 | 0.6 | 2.12 | 3.66 | 4.16 | 6 | 1.2 | | | | | | |