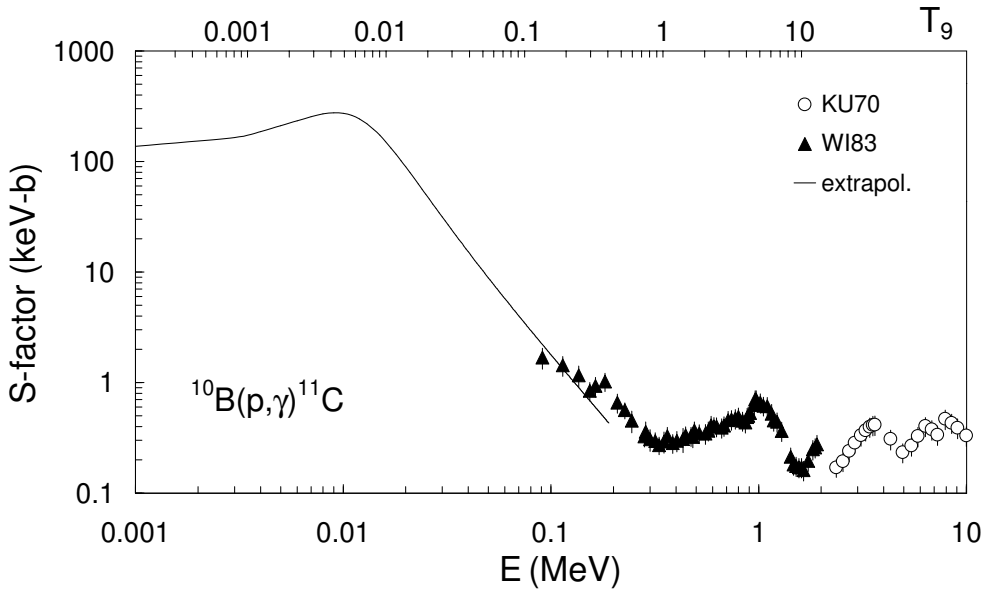
Reaction : ^{10}B(p,γ)^{11}C

The experimental data from KU70 and WI83 are adopted. They cover the reaction rate region from $T_9 = 0.15$ to 10. For $T_9 < 0.15$, the reaction rates are influenced by a low energy resonance ($\ell = 0$) resonance at $E_r = (9 \pm 2)$ keV [WI83] [see also ^{10}B(p,α)^{7}Be]. For $E < 0.09$ MeV, the S-factor is approximated by a Breit-Wigner expression using the parameters of the 9 keV resonance given by WI83, ($\sigma_r = (2.07 \pm 0.40) \times 10^{-14}$ μb, $\Gamma_\gamma/\Gamma_{tot} = (2.6 \pm 0.15) \times 10^{-4}$ and $\Gamma_{tot} = 15 \pm 1$ keV). From these parameters we obtain $\Gamma_p = (1.0 \pm 0.2) \times 10^{-17}$ keV and $\Gamma_\gamma = (3.9 \pm 0.3) \times 10^{-3}$ keV. We have studied the influence of the energy error by calculating the reduced width γ^2 corresponding to an energy of 9 keV, and the S-factor curves for 7 and 11 keV and this γ^2. The error of σ_r, $\Gamma_\gamma/\Gamma_{tot}$ and Γ_{tot} is also added. The results show that the uncertainty in the rates is large at temperatures below 0.001, but for $T_9 \geq 0.003$ and in the region of the Breit-Wigner approximation, the error is not larger than 30%. The large differences between the adopted rates and the CA88 ones at low temperatures are mainly due to the contribution of this low energy resonance, which is not included in CA88.



T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio
0.004	1.14	1.45	1.87	-22	7800	0.06	2.47	3.14	4.00	-5	230	0.6	4.98	6.22	7.46	0	9.9
0.005	2.21	2.81	3.59	-20	7500	0.07	0.82	1.04	1.32	-4	180	0.7	0.82	1.03	1.23	1	8.3
0.006	1.16	1.47	1.87	-18	6900	0.08	2.16	2.74	3.49	-4	140	0.8	1.26	1.58	1.89	1	7.1
0.007	2.61	3.31	4.20	-17	6200	0.09	4.86	6.18	7.84	-4	120	0.9	1.84	2.30	2.76	1	6.1
0.008	3.29	4.17	5.29	-16	5500	0.1	0.97	1.24	1.56	-3	98	1	2.57	3.21	3.86	1	5.2
0.009	2.74	3.46	4.38	-15	4800	0.11	1.77	2.25	2.84	-3	84	1.25	5.22	6.53	7.84	1	3.2
0.01	1.66	2.10	2.66	-14	4200	0.12	3.02	3.83	4.82	-3	73	1.5	0.92	1.15	1.38	2	2.1
0.011	7.90	9.98	12.6	-14	3700	0.13	4.85	6.16	7.71	-3	65	1.75	1.45	1.81	2.17	2	1.5
0.012	3.11	3.93	4.97	-13	3300	0.14	7.45	9.45	11.8	-3	58	2	2.10	2.62	3.15	2	1.2
0.013	1.05	1.32	1.68	-12	2900	0.15	1.10	1.40	1.74	-2	52	2.5	3.67	4.58	5.50	2	0.9
0.014	3.12	3.94	4.99	-12	2600	0.16	1.58	2.00	2.47	-2	48	3	5.43	6.78	8.13	2	0.8
0.015	0.83	1.05	1.34	-11	2300	0.18	2.99	3.78	4.64	-2	41	3.5	7.25	9.05	10.9	2	0.8
0.016	2.04	2.58	3.27	-11	2100	0.2	5.20	6.55	8.02	-2	36	4	0.91	1.13	1.36	3	0.8
0.018	0.99	1.24	1.58	-10	1700	0.25	1.58	1.98	2.40	-1	28	5	1.25	1.56	1.87	3	0.8
0.02	3.78	4.77	6.06	-10	1500	0.3	3.65	4.57	5.51	-1	23	6	1.58	1.98	2.37	3	1.0
0.025	5.42	6.86	8.72	-9	1000	0.35	7.03	8.79	10.6	-1	19	7	1.91	2.38	2.86	3	1.1
0.03	4.03	5.11	6.49	-8	730	0.4	1.19	1.49	1.79	0	16	8	2.23	2.79	3.34	3	1.3
0.04	7.20	9.13	11.6	-7	450	0.45	1.85	2.31	2.77	0	14	9	2.56	3.19	3.83	3	1.6
0.05	5.41	6.87	8.76	-6	310	0.5	2.69	3.36	4.03	0	12	10	2.88	3.60	4.31	3	1.9