Reaction : $^{7}\mathrm{Be}(\alpha,\gamma)^{11}\mathrm{C}$

Experimental data are available only for the first two resonances at $E_r = 0.560$ and 0.877 MeV [HA84]. For the non-resonant rates, theoretical information is available up to $T_9 = 0.7$ only ($E_0 = 0.53$ MeV, $\Delta E_0 = 0.41$ MeV), since calculated cross sections [DE95], which also include a subthreshold resonance ($J^\pi = 3/2^+$, $E_r = -43$ keV), are restricted to $E \leq 1$ MeV. In [BU88], the S-factor is computed with a potential model, but some parameters of this model can not be determined with precision. Beyond $T_9 = 2$, higher-energy resonances should contribute (the first one is a $7/2^+$ resonance at $E_r = 1.11$ MeV), but $\omega\gamma$ values are not available. Consequently, HF rates have been used for $T_9 \geq 2$. The origin of the non-resonant term of CA88 is unknown (the positive S_0' value does not correspond to the tail of a subthreshold state). The strong enhancement at low temperatures is due the presence of the subthreshold state, which is not included in CA88. Between $T_9 = 0.3$ and $T_9 = 5$, the resonant term dominates, and both reaction rates are similar. Beyond $T_9 = 5$, our HF calculation yields larger rates than the CA88 ones.

E_r	J^π	$\omega\gamma$ (eV)	Γ_α (eV)	Γ_γ (eV)	Ref	
0.560	$3/2^-$	0.331±0.041	11±7	0.350±0.056	HA84	I
0.877	$5/2^-$	3.80±0.57	12.6±3.8	3.1±1.3	HA84	I

T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio
0.02	0.81	1.16	1.50	-26	133	0.16	3.28	4.69	6.10	-9	51	1.25	5.64	8.01	10.4	1	1.0
0.025	3.05	4.36	5.67	-24	126	0.18	1.49	2.13	2.77	-8	44	1.5	1.25	1.93	4.19	2	1.0
0.03	2.79	3.98	5.17	-22	119	0.2	5.52	7.90	10.3	-8	28	1.75	2.13	3.17	4.21	2	0.9
0.04	1.96	2.80	3.63	-19	108	0.25	1.08	1.58	2.15	-6	3.1	2	3.21	4.84	6.46	2	0.9
0.05	2.02	2.89	3.76	-17	99	0.3	2.57	3.82	5.34	-5	1.3	2.5	4.64	7.61	10.6	2	0.8
0.06	6.84	9.78	12.7	-16	91	0.35	3.93	5.73	7.89	-4	1.1	3	0.59	1.05	1.50	3	0.7
0.07	1.12	1.61	2.09	-14	84	0.4	3.22	4.61	6.23	-3	1.1	3.5	0.70	1.33	1.96	3	0.7
0.08	1.12	1.60	2.08	-13	78	0.45	1.65	2.32	3.09	-2	1.1	4	0.80	1.61	2.43	3	0.7
0.09	0.78	1.11	1.44	-12	73	0.5	6.03	8.40	11.1	-2	1.1	5	0.93	2.15	3.36	3	0.8
0.10	4.09	5.85	7.61	-12	69	0.6	4.12	5.65	7.31	-1	1.1	6	1.03	2.66	4.28	3	0.9
0.11	1.74	2.49	3.24	-11	65	0.7	1.60	2.18	2.79	0	1.1	7	1.10	3.15	5.18	3	1.0
0.12	6.27	8.96	11.7	-11	61	0.8	4.41	6.01	7.66	0	1.1	8	1.16	3.63	6.08	3	1.2
0.13	1.97	2.81	3.65	-10	58	0.9	0.97	1.33	1.70	1	1.1	9	1.21	4.10	6.97	3	1.3
0.14	5.50	7.86	10.2	-10	55	1	1.84	2.54	3.26	1	1.1	10	1.25	4.58	7.88	3	1.6
0.15	1.40	2.00	2.60	-9	53												