Reaction: $^{15}\mathrm{N}(\alpha,\gamma)^{19}\mathrm{F}$

The main contribution to the rates below $T_9 = 0.2$ comes from the $E_r = 364$ keV resonance, for which we use the experimental strength $\omega\gamma$ of OL96. Uncertainties on this strength is adopted from OL97, following the discussions of OL96 and WI97. Adopted resonance strengths come mainly from RO72a, RO73d, DI77, SY78 and WI97 for a total of 48 resonances. For those at 1413, 1452, 1486 and 1524 keV, the $\omega\gamma$ values from AI70 are used, renormalized to the revised strength of the resonance at 1326 keV from DI71a. For the resonances from $E = 1607$ to 2149 keV the resonance strengths of RO72b and WI97 are used. From $E = 2268$ to 2912 keV, those of DI77 are adopted. The data of SY78 are used for the resonances from $E = 4358$ to 5823 keV, and from $E = 5914$ to 6398 keV. The contribution of the direct capture to the first six levels of ^{19}F is calculated; it only affects the rates near $T_9 = 0.08$ [OL96]. Tails of higher lying resonances make negligible contributions to the rates, when compared with the direct capture. For $T_9 \leq 0.2$, our rates are about 50 times lower than the CA88 ones, as a result of our adoption of the OL96 strength of the $E_r = 364$ keV resonance, which is 60 times smaller than the value selected by CA88. Around $T_9 = 0.5$, the difference between the present rates and the CA88 ones is probably related to the $E_r = 669$ keV resonance, which has been neglected in CA88.

E_r (MeV)	J^π	$\omega\gamma$ (eV)			
		WI97	others	adopt	
0.364 ± 0.002	$7/2^+$		$(6^{+6}_{-3}) \times 10^{-9}$ [OL96,OL97]	$(6^{+6}_{-3}) \times 10^{-9}$	I
0.536 ± 0.002	$5/2^+$	$(9.6 \pm 1.2) \times 10^{-5}$	$(9.6 \pm 2.1) \times 10^{-5}$ [MA87]	$(9.6 \pm 1.0) \times 10^{-5}$	I
0.542 ± 0.002	$3/2^-$	$(6.4 \pm 2.5) \times 10^{-6}$	$< 1 \times 10^{-5}$ [MA87]	$(6.4 \pm 2.5) \times 10^{-6}$	M
0.669 ± 0.002	$5/2^-$	$(5.6 \pm 0.6) \times 10^{-3}$	$(5.9 \pm 1.5) \times 10^{-3}\star$	$(5.7 \pm 0.6) \times 10^{-3}$	I
			$(6.3 \pm 2.1) \times 10^{-3}$ [RO72b]		
1.093 ± 0.003	$5/2^+$	$(9.7 \pm 1.6) \times 10^{-3}$	$\approx 10^{-2}\star$	$(9.7 \pm 1.6) \times 10^{-3}$	M
1.326 ± 0.003	$1/2^+$	1.69 ± 0.14	1.64 ± 0.16 [DI71b]	1.67 ± 0.11	M
Res. 1.607 – 2.912 MeV		see comments			
		UN74			
3.152 ± 0.002	$11/2^-$	0.95 ± 0.14	1.5 ± 0.2 [DI71b]	1.00 ± 0.15	M
			1.15 ± 0.23 [RO73d]		
3.525 ± 0.003	$(5/2^+)$	17.9 ± 2.1	17.0 ± 2.7 [RO76]	17.6 ± 1.7	M
3.645 ± 0.003	$3/2^+$		3.7 ± 0.9 [RO76]	3.7 ± 0.9	M
		SY78			
3.915 ± 0.003	$7/2^+$		2.3 ± 0.4 [DI71b]	2.3 ± 0.4	M
3.924 ± 0.003	$11/2^+$		3.1 ± 0.5 [DI71b]	3.1 ± 0.5	M
4.273 ± 0.005	$13/2^-$	0.58 ± 0.1	0.53 ± 0.08 [UN74]	0.53 ± 0.08	M
			0.51 ± 0.07 [RO76]		
4.295 ± 0.005	$5/2^+$	2.1 ± 0.5	1.37 ± 0.18 [RO76]	1.45 ± 0.17	M
Res. 4.358 – 5.823 MeV		see comments			
5.860 ± 0.004	$11/2^-$	3.6 ± 0.6	3.48 ± 0.47 [RO76]	3.5 ± 0.4	M
Res. 5.914 – 6.398 MeV		see comments			

*From AI70, and renormalized to the 1.326 MeV resonance in DI71a

T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio
0.08	1.85	2.68	4.53	-25	0.06	0.3	1.85	2.29	2.84	-8	0.5	1.75	7.62	9.00	10.4	0	0.9
0.09	1.33	2.94	7.04	-23	0.02	0.35	3.60	4.36	5.24	-7	1.6	2	1.95	2.31	2.68	1	1.0
0.1	0.99	2.41	6.00	-21	0.02	0.4	3.56	4.25	5.03	-6	4.2	2.5	7.29	8.67	10.1	1	1.1
0.11	3.89	9.54	23.5	-20	0.02	0.45	2.18	2.58	3.03	-5	8.8	3	1.74	2.08	2.42	2	1.2
0.12	0.85	2.05	4.96	-18	0.02	0.5	0.94	1.11	1.29	-4	13	3.5	3.23	3.85	4.48	2	1.2
0.13	1.14	2.73	6.50	-17	0.02	0.6	8.56	9.98	11.5	-4	10	4	5.12	6.10	7.10	2	1.2
0.14	1.07	2.50	5.87	-16	0.02	0.7	4.11	4.77	5.46	-3	4.8	5	0.97	1.16	1.35	3	1.1
0.15	0.75	1.71	3.95	-15	0.02	0.8	1.34	1.54	1.76	-2	2.5	6	1.49	1.78	2.07	3	1.0
0.16	4.24	9.36	21.1	-15	0.02	0.9	3.45	3.97	4.51	-2	1.5	7	2.01	2.40	2.80	3	0.9
0.18	0.89	1.74	3.61	-13	0.02	1	7.82	8.99	10.2	-2	1.0	8	2.51	3.00	3.50	3	0.8
0.2	1.32	2.22	4.01	-12	0.03	1.25	4.82	5.59	6.40	-1	0.7	9	2.97	3.55	4.15	3	0.8
0.25	3.39	4.47	6.06	-10	0.13	1.5	2.26	2.65	3.06	0	0.8	10	3.38	4.05	4.74	3	0.7