Reaction: $^{17}O(p,\gamma)^{18}F$

Direct capture contribution comes from a low energy extrapolation of experimental cross sections [RO73a,RO75a] with about 20% quoted uncertainty. The contribution of the 1^+ $E_r = -3.12$ keV subthreshold resonance is negligible with respect to the direct capture process. Between $T_9 = 0.1$ and 0.2, the rates are dominated by the contribution of the $E_r = 66$ keV resonance. Its strength is calculated using the values $\Gamma = 131 \pm 5$ eV [MA80], $\Gamma_\gamma = 1.4 \pm 0.3$ eV [MA80] and $\Gamma_p = 22^{+7}_{-4}$ neV, as suggested by BL95. This Γ_p value lies between the one obtained by LA89 through a proton transfer experiment and the upper limit of TR95. The strength of the $E_r = 179.5$ keV resonance is unknown. We use the upper limit for its proton width [LA89], the total width $\Gamma = 44 \pm 30$ meV and the average radiative width $\Gamma_\gamma = 22$ meV from RO73c to obtain an upper limit for the strength (in good agreement with RO73b). With these assumptions, it dominates the total rates between $T_9 = 0.1$ and 0.5. In RO73b and KI79a, the measurements are relative to the strength of the 633 keV resonance in $^{27}Al(p,\gamma)^{28}Si$. The adopted values come from the weighted average of the SE73 values and the renormalized ones from RO73b and KI79a (according to the revised $J^\pi = 3^-$, 633 keV resonance strength in $^{27}Al(p,\gamma)^{28}Si$ [EN90]). Resonances at energies $E_r \geq 1270$ keV are from SE78. Above $T_9 = 3$, HF estimates are used (see Sect. 2.5). The enhancements with respect to the CA88 rates near $T_9 = 0.05$ reflect the contribution of the $E_r = 66$ keV resonance, which is not included in CA88. Those near $T_9 = 0.25$ are due to the revised upper limit of the $E_r = 179.5$ keV resonance strength.

E_r (keV)	J^π	$\omega\gamma$ (eV)				
		SE73	RO73b*	Others	adopt	
66.0 ± 0.3	1^-			$19^{+11}_{-16} \times 10^{-11}$ [LA89] $5.9^{+1.9}_{-1.1} \times 10^{-11}$ [BL95] $\leq 8.60 \times 10^{-11}$ [TR95]	$5.9^{+1.9}_{-1.1} \times 10^{-11}$*	I
179.5 ± 2.4	2^-		$< 0.42 \times 10^{-3}$	$< 0.6 \times 10^{-3}$ [LA89]	$2.5^{+22}_{-2.5} \times 10^{-5}$	I
489.9 ± 1.1	4^-	$(6.8 \pm 2.0) \times 10^{-3}$	$(21 \pm 4) \times 10^{-3}$		$(9 \pm 1.6) \times 10^{-3}$	M
501.5 ± 3.0	1^+		< 0.33		$2^{+18}_{-2} \times 10^{-2}$	M
529.97 ± 0.33	0^+	$(62 \pm 18) \times 10^{-3}$	$(18 \pm 5) \times 10^{-2}$		$(75 \pm 16) \times 10^{-3}$	M
556.7 ± 0.9	3^+	$(18 \pm 5) \times 10^{-2}$	$(5.6 \pm 1.5) \times 10^{-1}$		$(22 \pm 5) \times 10^{-2}$	M
633.9 ± 0.8	3^-	$(11 \pm 3) \times 10^{-2}$	$(27 \pm 5) \times 10^{-2}$	$(17 \pm 4) \times 10^{-2}$ [KI79a]	$(10.6 \pm 1.9) \times 10^{-2}$	M
635.5 ± 3.0	3^-			$(9.7 \pm 2.2) \times 10^{-2}$ [KI79a]	$(6.0 \pm 1.3) \times 10^{-2}$	M
655.5 ± 2.5	1^+		$< 1.1 \times 10^{-3}$		$6.5^{+58}_{-6.5} \times 10^{-5}$	M
676.7 ± 0.9	2^+	$(20.6 \pm 6.5) \times 10^{-2}$	$(7.6 \pm 1.9) \times 10^{-1}$		$(2.7 \pm 0.6) \times 10^{-1}$	M
704.0 ± 0.8	3^+	$(19.2 \pm 6.7) \times 10^{-3}$	$(53 \pm 14) \times 10^{-3}$		$(24 \pm 5) \times 10^{-3}$	M
779.0 ± 1.7	2^+	$(17.5 \pm 5.4) \times 10^{-3}$	$(50 \pm 15) \times 10^{-3}$		$(20.9 \pm 4.7) \times 10^{-3}$	M
878.4 ± 1.5	3^+	$(10 \pm 5) \times 10^{-3}$	$(30 \pm 12) \times 10^{-3}$		$(12.5 \pm 4.2) \times 10^{-3}$	M
960.5 ± 1.5	5^+	$< 4.2 \times 10^{-3}$	$< 0.2 \times 10^{-3}$		$1.2^{+10}_{-1.2} \times 10^{-5}$	M
1037.2 ± 0.8	2^-	$(130 \pm 43) \times 10^{-3}$	$(3.6 \pm 1.0) \times 10^{-1}$		$(160 \pm 36) \times 10^{-3}$	M
1170.5 ± 1.4	4^+	$(52 \pm 15) \times 10^{-3}$	$(23 \pm 6) \times 10^{-2}$		$(65 \pm 14) \times 10^{-3}$	M
1196.6 ± 1.5	1^+, 2, 3^+	$(18 \pm 5) \times 10^{-3}$	$(45 \pm 17) \times 10^{-3}$		$(20.4 \pm 4.8) \times 10^{-3}$	M
1270.9 ± 1.7	3, 4^-	$(16.7 \pm 5.4) \times 10^{-3}$	$(83 \pm 33) \times 10^{-3}$		$(18.9 \pm 5.2) \times 10^{-3}$	M
Res. 1729.5 – 1977.5 keV		see comments				

*see comments

T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio	T_9	low	adopt	high	exp	ratio
0.009	3.61	4.52	5.42	-26	0.8	0.1	2.15	3.89	18.8	-7	1.3	0.9	5.55	7.75	15.7	1	0.5
0.01	5.39	6.73	8.08	-25	0.8	0.11	0.48	1.28	9.32	-6	1.1	1	1.00	1.38	2.67	2	0.5
0.011	5.71	7.14	8.57	-24	0.8	0.12	0.98	4.12	37.2	-6	1.1	1.25	2.76	3.75	6.77	2	0.4
0.012	4.61	5.77	6.92	-23	0.8	0.13	0.19	1.21	12.1	-5	1.1	1.5	5.26	7.06	12.2	2	0.4
0.013	2.99	3.73	4.48	-22	0.8	0.14	0.35	3.17	33.2	-5	1.2	1.75	0.81	1.08	1.81	3	0.4
0.014	1.61	2.01	2.41	-21	0.8	0.15	0.62	7.41	79.4	-5	1.3	2	1.10	1.45	2.38	3	0.4
0.015	7.43	9.29	11.1	-21	0.8	0.16	0.10	1.57	16.9	-4	1.3	2.5	1.61	2.11	3.36	3	0.4
0.016	3.01	3.76	4.51	-20	0.8	0.18	0.25	5.43	58.9	-4	1.4	3	2.00	2.61	4.07	3	0.4
0.018	3.57	4.47	5.37	-19	0.9	0.2	0.05	1.46	15.7	-3	1.5	3.5	2.59	3.25	4.77	3	0.4
0.02	3.05	3.82	4.62	-18	0.9	0.25	0.20	8.24	87.8	-3	1.6	4	3.11	3.87	5.46	3	0.4
0.025	2.95	3.83	4.99	-16	1.3	0.3	0.06	2.52	26.4	-2	1.5	5	4.01	5.14	7.15	3	0.4
0.03	1.62	2.17	3.05	-14	2.8	0.35	0.36	5.78	57.0	-2	1.3	6	4.78	6.59	9.55	3	0.5
0.04	4.89	6.54	9.30	-12	7.8	0.4	0.24	1.28	10.5	-1	0.9	7	5.48	8.29	12.9	3	0.6
0.05	1.62	2.13	2.98	-10	9.0	0.45	1.16	3.11	18.8	-1	0.7	8	0.62	1.03	1.74	4	0.6
0.06	1.65	2.14	2.96	-9	7.1	0.5	4.07	7.90	34.6	-1	0.6	9	0.68	1.25	2.31	4	0.7
0.07	0.87	1.12	1.56	-8	4.8	0.6	2.65	4.12	11.9	0	0.5	10	0.75	1.50	3.01	4	0.8
0.08	3.11	4.06	6.57	-8	3.1	0.7	0.99	1.45	3.45	1	0.5						
0.09	0.88	1.25	3.29	-7	1.9	0.8	2.63	3.74	8.06	1	0.5						