Appendix A.10 Critical temperatures and critical pressures for common toxicants (abstracted from CRC Press, 1975 and ACGIH Ventilation Manual, 1988).

name	formula	T_c (ºC)	P_c (atm)
acetaldehyde	C_4H_4O	187.8	54.7
acetic acid	$C_2H_4O_2$	321.6	57.1
acetone	C_3H_6O	235.5	47
acetonitrile	C_2H_3N	274.7	47.7
aniline	C_6H_7N	425.6	52.3
benzene	C_6H_6	288.9	48.6
benzyl chloride	C_6H_5Cl	359.2	44.6
boron trifluoride	BF_3	-12.3	49.2
carbon disulfide	CS_2	279	78
carbon tetrachloride	CCI_4	283.4	45.6
diethylamine	$C_4H_{11}N$	223.3	36.6
dimethylamine	C_2H_7N	164.6	52.4
ethylene oxide	C_2H_5O	195.8	71
hydrogen chloride	HCl	51.4	82.1
ydrogen cyanide	HCN	183.5	48.9
hydrogen sulfide	H_2S	100.4	88.9
methyl alcohol	CH_40	240	78.5
methylamine	CH_5N	156.9	40.2
methylene chloride	CH_2Cl_2	237	60
methyl mercaptan	CH_4S	196.8	71.4
naphthalene	$C_{10}H_8$	474.8	40.6
nitric oxide	NO	-93	64
ozone	O_3	-5.2	67
phenol	C_6H_6O	421.1	60.5
propylene oxide	C_3H_6O	209	48.6
styrene	C_8H_8	374.4	39.4
triethylamine	$C_6H_{15}N$	258.9	30
toluene	C_7H_8	320.8	41.6

Appendix A.11 Thermophysical properties of air (abstracted from Schmidt et al., 1984).

T (K)	ρ (kg/m^3)	C_p (kJ/kg K)	μ (N s/m^2)	ν (m^2/s)	κ (W/m K)	α (m^2/s)	Pr
200	1.7458	1.007	132.5 x 10^{-7}	7.590 x 10^{-6}	18.1 x 10^{-3}	10.3 x 10^{-6}	0.737
250	1.3947	1.006	159.6 x 10^{-7}	11.44 x 10^{-6}	22.3 x 10^{-3}	15.9 x 10^{-6}	0.720
300	1.1614	1.007	184.6 x 10^{-7}	15.89 x 10^{-6}	26.3 x 10^{-3}	22.5 x 10^{-6}	0.707
350	0.9950	1.009	208.2 x 10^{-7}	20.92 x 10^{-6}	30.0 x 10^{-3}	29.9 x 10^{-6}	0.700
400	0.8711	1.014	230.1 x 10^{-7}	26.41 x 10^{-6}	33.8 x 10^{-3}	38.3 x 10^{-6}	0.690
450	0.7740	1.021	250.7 x 10^{-7}	32.39 x 10^{-6}	37.3 x 10^{-3}	47.2 x 10^{-6}	0.686
500	0.6964	1.030	270.1 x 10^{-7}	38.79 x 10^{-6}	40.7 x 10^{-3}	56.7 x 10^{-6}	0.684
550	0.6329	1.040	288.4 x 10^{-7}	45.57 x 10^{-6}	43.9 x 10^{-3}	66.7 x 10^{-6}	0.683
600	0.5804	1.051	305.8 x 10^{-7}	52.69 x 10^{-6}	46.9 x 10^{-3}	76.9 x 10^{-6}	0.685
650	0.5356	1.063	322.5 x 10^{-7}	60.21 x 10^{-6}	49.7 x 10^{-3}	87.3 x 10^{-6}	0.690
700	0.4975	1.075	338.8 x 10^{-7}	68.10 x 10^{-6}	52.4 x 10^{-3}	98.0 x 10^{-6}	0.695
750	0.4643	1.087	354.6 x 10^{-7}	76.37 x 10^{-6}	54.9 x 10^{-3}	109.0 x 10^{-6}	0.702
800	0.4354	1.099	369.8 x 10^{-7}	84.93 x 10^{-6}	57.3 x 10^{-3}	120.0 x 10^{-6}	0.709
850	0.4097	1.110	384.3 x 10^{-7}	93.80 x 10^{-6}	59.6 x 10^{-3}	131.0 x 10^{-6}	0.716
900	0.3868	1.121	398.1 x 10^{-7}	102.9 x 10^{-6}	62.0 x 10^{-3}	143.0 x 10^{-6}	0.720
950	0.3666	1.131	411.3 x 10^{-7}	112.2 x 10^{-6}	64.3 x 10^{-3}	155.0 x 10^{-6}	0.723
1000	0.3482	1.141	424.4 x 10^{-7}	121.9 x 10^{-6}	66.7 x 10^{-3}	168.0 x 10^{-6}	0.726

Formulas for interpolation; T in absolute temperature (K), and σ = standard deviation:

$$\rho = \frac{348.59}{T} \quad \left(\sigma = 9\times10^{-4}\right); \qquad f(T) = A + BT + CT^2 + DT^3,$$

where coefficients are given below:

f(T)	A	B	C	D	σ
c_p	1.0507	-3.645 x 10^{-4}	8.388 x 10^{-7}	-3.848 x 10^{-10}	4 x 10^{-4}
μ x 10^7	13.554	0.6738	-3.808 x 10^{-4}	1.183 x 10^{-7}	0.4192
κ x 10^3	-2.450	0.1130	-6.287 x 10^{-5}	1.891 x 10^{-8}	0.1198
α x 10^6	-11.064	7.04 x 10^{-2}	1.528 x 10^{-4}	-4.476 x 10^{-8}	0.4417
Pr	0.8650	-8.488 x 10^{-4}	-1.234 x 10^{-6}	-5.232 x 10^{-10}	1.623 x 10^{-3}

Sutherland's law for air viscosity:

$$\mu = \mu_0 \left(\frac{T}{T_0}\right)^{1.5} \left(\frac{T_0 + S}{T + S}\right)$$

where

- μ_0 = 1.71 x 10^{-5} kg/(m s)
- T_0 = 273.15 K
- S = 110.4 K
- T must be in units of K.