

THERMAL CONDUCTIVITY OF GASES

Marcia L. Huber and Allan H. Harvey

The following table gives the thermal conductivity of some common gases as a function of temperature. Unless otherwise noted, the thermal conductivity values refer to a pressure of 100 kPa (1 bar) or to the saturation vapor pressure if that is less than 100 kPa. The notation $P = 0$ indicates that the low-pressure limiting value is given. The difference between the thermal conduc-

tivity at 100 kPa and the limiting value is generally less than 1%. Uncertainties for the thermal conductivities of gases in this table are generally less than 3%; uncertainty information on specific fluids can be found in the references. Thermal conductivity is given in units of $\text{mW m}^{-1} \text{K}^{-1}$. Substances are listed in the modified Hill order.

		Thermal conductivity in $\text{mW m}^{-1} \text{K}^{-1}$						
		100 K	200 K	300 K	400 K	500 K	600 K	Ref.
	Air	9.5	18.5	26.4	33.5	39.9	46.0	1
Ar	Argon ($P = 0$)	6.3	12.4	17.7	22.4	26.5	30.3	2, 3*
BF_3	Boron trifluoride			19.0	24.6			4
ClH	Hydrogen chloride		9.2	14.5	19.5	24.0	28.1	4
F_6S	Sulfur hexafluoride ($P = 0$)			13.0	20.6	27.5	33.8	5
H_2	Normal hydrogen ($P = 0$)	68.2	132.8	186.6	230.9	270.9	309.1	6
H_2O	Water ($P = 0$)			18.6	26.1	35.6	46.2	7
D_2O	Deuterium oxide ($P = 0$)			18.2	26.6	36.3	47.6	8
H_2S	Hydrogen sulfide			14.6	20.5	26.4	32.4	4
H_3N	Ammonia			25.1	37.2	53.1	68.6	9
He	Helium ($P = 0$)	74.7	118.3	155.7	189.6	221.4	251.6	10
Kr	Krypton ($P = 0$)		6.5	9.5	12.3	14.8	17.1	11
NO	Nitric oxide		17.8	25.9	33.1	39.6	46.2	4
N_2	Nitrogen	9.4	18.3	26.0	32.8	39.0	44.8	1
N_2O	Nitrous oxide		9.8	17.4	26.0	34.1	41.8	4
Ne	Neon ($P = 0$)	22.3	37.4	49.4	59.9	69.5	78.5	12
O_2	Oxygen	9.1	18.2	26.5	34.0	41.0	47.7	1
O_2S	Sulfur dioxide			9.6	14.3	20.0	25.6	4
Xe	Xenon ($P = 0$)		3.7	5.5	7.2	8.8	10.3	3*, 11
CCl_2F_2	Dichlorodifluoromethane			9.9	15.0	20.1	25.2	13
CF_4	Tetrafluoromethane ($P = 0$)			16.0	24.1	32.2	39.9	5
CO	Carbon monoxide ($P = 0$)			25.0	32.3	39.2	45.7	14
CO_2	Carbon dioxide		9.6	16.8	25.2	33.5	41.6	15
CHCl_3	Trichloromethane			7.5	11.1	15.1		4
CH_4	Methane ($P = 0$)	10.4	21.8	34.4	50.0	68.4	88.6	16
CH_4O	Methanol				26.2	38.6	53.0	4
$\text{C}_2\text{Cl}_2\text{F}_4$	1,2-Dichloro-1,1,2,2-tetrafluoroethane			10.3	15.7	21.1		13
$\text{C}_2\text{Cl}_3\text{F}_3$	1,1,2-Trichloro-1,2,2-trifluoroethane			9.0	13.6	18.3		13
C_2H_2	Acetylene			21.4	33.3	45.4	56.8	4
C_2H_4	Ethylene		11.3	20.6	34.7	49.9	68.6	17
C_2H_6	Ethane		10.7	21.2	36.0	53.8	73.3	18
$\text{C}_2\text{H}_6\text{O}$	Ethanol			14.4	25.8	38.4	53.2	4
$\text{C}_3\text{H}_6\text{O}$	Acetone			11.5	20.2	30.6	42.7	4
C_3H_8	Propane			18.5	31.0	46.4	64.6	19
C_4F_8	Perfluorocyclobutane			12.5	19.5			13
C_4H_{10}	Butane			16.7	28.3	43.0	60.9	20
C_4H_{10}	Isobutane			17.1	28.9	43.2	60.2	21
$\text{C}_4\text{H}_{10}\text{O}$	Diethyl ether			15.1	25.0	37.1		4
C_5H_{12}	Pentane				24.9	37.8	52.7	4
C_6H_{14}	Hexane				23.4	35.4	48.7	4

* More accurate data covering a restricted temperature range.

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