

# THERMAL CONDUCTIVITY OF GASES

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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*
$\text{BF}_3$	Boron trifluoride			19.0	24.6			4
ClH	Hydrogen chloride		9.2	14.5	19.5	24.0	28.1	4
$\text{F}_6\text{S}$	Sulfur hexafluoride ( $P = 0$ )			13.0	20.6	27.5	33.8	5
$\text{H}_2$	Normal hydrogen ( $P = 0$ )	68.2	132.8	186.6	230.9	270.9	309.1	6
$\text{H}_2\text{O}$	Water ( $P = 0$ )			18.6	26.1	35.6	46.2	7
$\text{D}_2\text{O}$	Deuterium oxide ( $P = 0$ )			18.2	26.6	36.3	47.6	8
$\text{H}_2\text{S}$	Hydrogen sulfide			14.6	20.5	26.4	32.4	4
$\text{H}_3\text{N}$	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
$\text{N}_2$	Nitrogen	9.4	18.3	26.0	32.8	39.0	44.8	1
$\text{N}_2\text{O}$	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
$\text{O}_2$	Oxygen	9.1	18.2	26.5	34.0	41.0	47.7	1
$\text{O}_2\text{S}$	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
$\text{CCl}_2\text{F}_2$	Dichlorodifluoromethane			9.9	15.0	20.1	25.2	13
$\text{CF}_4$	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
$\text{CO}_2$	Carbon dioxide		9.6	16.8	25.2	33.5	41.6	15
$\text{CHCl}_3$	Trichloromethane			7.5	11.1	15.1		4
$\text{CH}_4$	Methane ( $P = 0$ )	10.4	21.8	34.4	50.0	68.4	88.6	16
$\text{CH}_4\text{O}$	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
$\text{C}_2\text{H}_2$	Acetylene			21.4	33.3	45.4	56.8	4
$\text{C}_2\text{H}_4$	Ethylene		11.3	20.6	34.7	49.9	68.6	17
$\text{C}_2\text{H}_6$	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
$\text{C}_3\text{H}_8$	Propane			18.5	31.0	46.4	64.6	19
$\text{C}_4\text{F}_8$	Perfluorocyclobutane			12.5	19.5			13
$\text{C}_4\text{H}_{10}$	Butane			16.7	28.3	43.0	60.9	20
$\text{C}_4\text{H}_{10}$	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
$\text{C}_5\text{H}_{12}$	Pentane				24.9	37.8	52.7	4
$\text{C}_6\text{H}_{14}$	Hexane				23.4	35.4	48.7	4

\* More accurate data covering a restricted temperature range.

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