

Thermal conductivity of liquids: Aliphatic hydrocarbons

Part 1. Alkanes

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THERMAL CONDUCTIVITY OF LIQUIDS: ALIPHATIC HYDROCARBONS PART 1. ALKANES

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Data sheets for each of the liquids are given in the following order:

Formula	Name	Alternative Name(s)	
C₁ to C₃ ALKANES			
1. CH ₄	Methane		7
2. C ₂ H ₆	Ethane		9
3. CH ₃ CH ₂ CH ₃	Propane		10
BUTANES			
4. CH ₃ [CH ₂] ₂ CH ₃	Butane	<i>n</i> -Butane	12
5. (CH ₃) ₃ CH	2-Methylpropane	Isobutane	14
PENTANES			
6. CH ₃ [CH ₂] ₃ CH ₃	Pentane	<i>n</i> -Pentane	15
7. (CH ₃) ₂ CHCH ₂ CH ₃	2-Methylbutane	Isopentane	17
8. (CH ₃) ₄ C	2,2-Dimethylpropane	Neopentane	18

Formula

Name

Alternative Name(s)

HEXANES

9. $\text{CH}_3[\text{CH}_2]_4\text{CH}_3$	Hexane	<i>n</i> -Hexane	19
10. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_2\text{CH}_3$	2-Methylpentane	Isohexane	22
11. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	3-Methylpentane		23
12. $(\text{CH}_3)_3\text{CCH}_2\text{CH}_3$	2,2-Dimethylbutane	Neohexane	24
13. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2$	2,3-Dimethylbutane	Diisopropyl	25

HEPTANES

14. $\text{CH}_3[\text{CH}_2]_5\text{CH}_3$	Heptane	<i>n</i> -Heptane	26
15. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_3\text{CH}_3$	2-Methylhexane	Isoheptane	30
16. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)[\text{CH}_2]_2\text{CH}_3$	3-Methylhexane		31
17. $(\text{CH}_3\text{CH}_2)_3\text{CH}$	3-Ethylpentane	Triethylmethane	32
18. $(\text{CH}_3)_3\text{C}[\text{CH}_2]_2\text{CH}_3$	2,2-Dimethylpentane		33
19. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	2,3-Dimethylpentane		34
20. $(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{CH}_3)_2$	2,4-Dimethylpentane		35
21. $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$	3,3-Dimethylpentane		36
22. $(\text{CH}_3)_3\text{CCH}(\text{CH}_3)_2$	2,2,3-Trimethylbutane	Triptane	37

OCTANES

23. $\text{CH}_3[\text{CH}_2]_6\text{CH}_3$	Octane	<i>n</i> -Octane	38
24. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_4\text{CH}_3$	2-Methylheptane		41
25. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)[\text{CH}_2]_3\text{CH}_3$	3-Methylheptane		42
26. $\text{CH}_3[\text{CH}_2]_2\text{CH}(\text{CH}_3)[\text{CH}_2]_2\text{CH}_3$	4-Methylheptane		43
27. $(\text{CH}_3\text{CH}_2)_2\text{CH}[\text{CH}_2]_2\text{CH}_3$	3-Ethylhexane		44
28. $(\text{CH}_3)_3\text{C}[\text{CH}_2]_3\text{CH}_3$	2,2-Dimethylhexane		45
29. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)[\text{CH}_2]_2\text{CH}_3$	2,3-Dimethylhexane		46
30. $(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	2,4-Dimethylhexane		47
31. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_2\text{CH}(\text{CH}_3)_2$	2,5-Dimethylhexane		48
32. $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2[\text{CH}_2]_2\text{CH}_3$	3,3-Dimethylhexane		49
33. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	3,4-Dimethylhexane		50
34. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_2\text{CH}_3)_2$	2-Methyl-3-ethylpentane		51
35. $(\text{CH}_3\text{CH}_2)_3\text{CCH}_3$	3-Methyl-3-ethylpentane		52
36. $(\text{CH}_3)_3\text{CCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	2,2,3-Trimethylpentane		53
37. $(\text{CH}_3)_3\text{CCH}_2\text{CH}(\text{CH}_3)_2$	2,2,4-Trimethylpentane	Isooctane	54
38. $(\text{CH}_3)_2\text{CHC}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$	2,3,3-Trimethylpentane		56
39. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)\text{CH}(\text{CH}_3)_2$	2,3,4-Trimethylpentane		57
40. $(\text{CH}_3)_3\text{CC}(\text{CH}_3)_3$	2,2,3,3-Tetramethylbutane	Hexamethylethane	58

Formula	Name	Alternative Name(s)
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NONANES

41. $\text{CH}_3[\text{CH}_2]_7\text{CH}_3$	Nonane	<i>n</i> -Nonane	59
42. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_5\text{CH}_3$	2-Methyloctane		62
43. $(\text{CH}_3)_3\text{C}[\text{CH}_2]_4\text{CH}_3$	2,2-Dimethylheptane		63
44. $(\text{CH}_3)_3\text{C}[\text{CH}_2]_2\text{CH}(\text{CH}_3)_2$	2,2,5-Trimethylhexane		64
45. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}(\text{CH}_3)_2$	2,3,5-Trimethylhexane		65
46. $(\text{CH}_3)_2\text{CHCH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$	2,4,4-Trimethylhexane		66
47. $(\text{CH}_3\text{CH}_2)_4\text{C}$	3,3-Diethylpentane	Tetraethylmethane	67
48. $(\text{CH}_3)_3\text{CC}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$	2,2,3,3-Tetramethylpentane		68
49. $(\text{CH}_3)_3\text{CCH}(\text{CH}_3)\text{CH}(\text{CH}_3)_2$	2,2,3,4-Tetramethylpentane		69
50. $(\text{CH}_3)_3\text{CCH}_2\text{C}(\text{CH}_3)_3$	2,2,4,4-Tetramethylpentane		70
51. $(\text{CH}_3)_2\text{CHC}(\text{CH}_3)_2\text{CH}(\text{CH}_3)_2$	2,3,3,4-Tetramethylpentane		71

DECANES

52. $\text{CH}_3[\text{CH}_2]_8\text{CH}_3$	Decane	<i>n</i> -Decane	72
53. $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	3,3,5-Trimethylheptane		75
54. $(\text{CH}_3)_3\text{CC}(\text{CH}_3)_2[\text{CH}_2]_2\text{CH}_3$	2,2,3,3-Tetramethylhexane		76
55. $(\text{CH}_3)_3\text{C}[\text{CH}_2]_2\text{C}(\text{CH}_3)_3$	2,2,5,5-Tetramethylhexane		77

UNDECANES

56. $\text{CH}_3[\text{CH}_2]_9\text{CH}_3$	Undecane	<i>n</i> -Undecane Hendecane	78
57. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_7\text{CH}_3$	2-Methyldecane		80

C₁₂ to C₁₅ ALKANES

58. $\text{CH}_3[\text{CH}_2]_{10}\text{CH}_3$	Dodecane	<i>n</i> -Dodecane	81
59. $\text{CH}_3[\text{CH}_2]_{11}\text{CH}_3$	Tridecane	<i>n</i> -Tridecane	83
60. $\text{CH}_3[\text{CH}_2]_{12}\text{CH}_3$	Tetradecane	<i>n</i> -Tetradecane	85
61. $\text{CH}_3[\text{CH}_2]_{13}\text{CH}_3$	Pentadecane	<i>n</i> -Pentadecane	87

HEXADECANES

62. $\text{CH}_3[\text{CH}_2]_{14}\text{CH}_3$	Hexadecane	<i>n</i> -Hexadecane Cetane	89
63. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_{12}\text{CH}_3$	2-Methylpentadecane		91
64. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)[\text{CH}_2]_{11}\text{CH}_3$	3-Methylpentadecane		92
65. $\text{CH}_3[\text{CH}_2]_2\text{CH}(\text{CH}_3)[\text{CH}_2]_{10}\text{CH}_3$	4-Methylpentadecane		93
66. $\text{CH}_3[\text{CH}_2]_3\text{CH}(\text{CH}_3)[\text{CH}_2]_9\text{CH}_3$	5-Methylpentadecane		94
67. $\text{CH}_3[\text{CH}_2]_4\text{CH}(\text{CH}_3)[\text{CH}_2]_8\text{CH}_3$	6-Methylpentadecane		95
68. $\text{CH}_3[\text{CH}_2]_5\text{CH}(\text{CH}_3)[\text{CH}_2]_7\text{CH}_3$	7-Methylpentadecane		96
69. $\text{CH}_3[\text{CH}_2]_6\text{CH}(\text{CH}_3)[\text{CH}_2]_6\text{CH}_3$	8-Methylpentadecane		97
70. $(\text{CH}_3\text{CH}_2)_2\text{CH}[\text{CH}_2]_{10}\text{CH}_3$	3-Ethyltetradecane		98
71. $(\text{CH}_3[\text{CH}_2]_2)_2\text{CH}[\text{CH}_2]_8\text{CH}_3$	4-Propyltridecane		99
72. $(\text{CH}_3[\text{CH}_2]_3)_2\text{CH}[\text{CH}_2]_6\text{CH}_3$	5-Butyldodecane		100
73. $(\text{CH}_3[\text{CH}_2]_4)_3\text{CH}$	6-Pentylundecane	Triptylmethane	101
74. $(\text{CH}_3)_3\text{CCH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{C}(\text{CH}_3)_3$	2,2,4,4,6,8,8-Heptamethylnonane		102

Formula

Name

Alternative Name(s)

C₁₇ to C₂₀ ALKANES

75. CH ₃ [CH ₂] ₁₅ CH ₃	Heptadecane	<i>n</i> -Heptadecane	103
76. CH ₃ [CH ₂] ₁₆ CH ₃	Octadecane	<i>n</i> -Octadecane	105
77. CH ₃ [CH ₂] ₁₇ CH ₃	Nonadecane	<i>n</i> -Nonadecane	107
78. CH ₃ [CH ₂] ₁₈ CH ₃	Eicosane	<i>n</i> -Eicosane	109

C₂₁ to C₂₄ ALKANES

79. CH ₃ [CH ₂] ₁₉ CH ₃	Heneicosane	<i>n</i> -Heneicosane	110
80. CH ₃ [CH ₂] ₂₀ CH ₃	Docosane	<i>n</i> -Docosane	111
81. CH ₃ [CH ₂] ₂₁ CH ₃	Tricosane	<i>n</i> -Tricosane	113
82. CH ₃ [CH ₂] ₂₂ CH ₃	Tetracosane	<i>n</i> -Tetracosane	114

THERMAL CONDUCTIVITY OF LIQUIDS: ALIPHATIC HYDROCARBONS

Part 1. Alkanes

1. INTRODUCTION

This Item presents values of thermal conductivity at saturation pressure, in tabular form, for straight and branched chain liquid alkanes.

The data on which these recommended values of thermal conductivity are based are the most reliable available and the temperature range covered is from the melting temperature to approximately 0.9 of the critical temperature. Quantities are expressed in SI units and conversion factors to other units are provided in Section 3.

Section 4 describes the procedure used to obtain the values of thermal conductivity presented and indicates the effect of pressure. Section 5 gives an explanation of the Tables and indicates the uncertainties in the values presented in them.

References to sources of supplementary information are given in Section 6. The data sources for each particular compound are listed on the appropriate data sheet.

2. NOTATION AND UNITS

The SI unit of thermal conductivity is the watt per metre kelvin (W/m K). A convenient submultiple SI unit for the range of thermal conductivity in this Item is the milliwatt per metre kelvin (mW/m K); hence that is the unit adopted here.

A	constant for each liquid in Equation (4.2)	mW/m K
A'	constant for each liquid in Equation (4.1)	mW/m K
B'	non-dimensional constant for each liquid in Equation (4.1)	–
B, C, D	non-dimensional constants for each liquid in Equation (4.2)	–
p	pressure	N/m ² (Pa)
T	kelvin temperature	K
t	Celsius temperature, $T - 273.15$	°C
λ	thermal conductivity	mW/m K

Subscripts

c	denotes value at the critical point
p	denotes value at pressure p
r	denotes reduced quantity, <i>e.g.</i> $T_r = T/T_c$.

3. CONVERSION FACTORS

$$\begin{aligned}
 1 \text{ mW/m K} &= 0.8598 \times 10^{-3} \text{ kcal/m h } ^\circ\text{C}^* \\
 &= 2.3885 \times 10^{-6} \text{ cal/cm s } ^\circ\text{C}^* \\
 &= 0.5778 \times 10^{-3} \text{ Chu/ft h } ^\circ\text{C}^* \\
 &= 0.5778 \times 10^{-3} \text{ Btu/ft h } ^\circ\text{F}^* \\
 &= 6.9335 \times 10^{-3} \text{ Btu in/ft}^2 \text{ h } ^\circ\text{F}^*
 \end{aligned}$$

$$\begin{aligned}
 10^5 \text{ N/m}^2 &= 1 \text{ bar} \\
 &= 14.5038 \text{ lbf/in}^2 \\
 &= 1.0197 \text{ kgf/cm}^2 \\
 &= 0.9869 \text{ atm} \\
 &= 750.062 \text{ mmHg.}
 \end{aligned}$$

* The values used for the calorie and British Thermal Unit are International Table values.

4. THERMAL CONDUCTIVITY

4.1 Thermal Conductivity at Saturation Pressure

In Reference 2 Riedel showed that the experimental data for the thermal conductivity of normal (that is unassociated) liquids along the saturation line could be represented by the equation:

$$\lambda = A' [1 + (20/3)(1 - T_r)^{2/3}]. \quad (4.1)$$

The range of applicability of Equation (4.1) is limited for most compounds. For the liquids considered in this Item a good representation of the data* between the melting temperature and $T_r = 0.9$ is obtained from the equation:

$$\lambda = A [1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]. \quad (4.2)$$

Measurements of thermal conductivity have been made for relatively few liquids at $T_r > 0.9$ and so, because of the uncertain variation of thermal conductivity in the critical region, data are presented only for temperatures up to $T_r = 0.9$. The equation extrapolates in a physically realistic manner to within a few kelvin of the critical point.

The critical temperatures for these compounds have either been taken from ESDU 84022, 84028, 85002 (References 8, 9 and 10) or estimated from correlations of ESDU values with chemical structure. In this Item, the critical temperatures should be regarded as correlating parameters only and should not be taken as a source of accurate values.

The derived values of A , B , C and D given in Table 7.1 are a correlated set of values giving the best fit to the experimental data, not only as individual compounds but also as members of their chemical series. This method of correlating data for a series of compounds has been described in References 5 and 6. For all the alkanes in this Item, it was found that C and D are directly related to $B^\dagger$. Correlated values of the constants A , B , C and D were used to estimate constants for liquids for which no experimental data exist. Using these values with the values of T_c given in Table 7.1, values of λ in mW/m K have been calculated for each compound from Equation (4.2) and are presented in the data sheets.

* Experimental data at temperatures below the normal boiling temperature, t_b are often at 1 atm pressure. As indicated in Section 4.2 the difference between values of λ at 1 atm pressure and at saturation pressure below t_b is not significant.

† $C = 1 - 3B$ and $D = 3B$. The values of B , C and D are presented to two decimal places in Table 7.1 and on the data sheets.

4.2 Effect of Pressure

At temperatures up to the normal boiling point, the effect of pressure from the saturation pressure to $50 \times 10^5 \text{ N/m}^2$ (up to 50 atm) is to increase the thermal conductivity by approximately 1 per cent and, for most practical purposes, values at saturation pressure may be taken as equal to those at atmospheric pressure.

Reference 1 gives measurements of thermal conductivity for a number of liquids up to $12\,000 \times 10^5 \text{ N/m}^2$ ($\approx 12\,000 \text{ atm}$) at 30°C and 75°C . A generalised correlation of these results is given in Reference 3, but a knowledge of the critical pressure of the substance is required for its use.

For pressures up to $500 \times 10^5 \text{ N/m}^2$ ($\approx 500 \text{ atm}$) between the melting temperature and the normal boiling point a very approximate relationship:

$$\lambda_p/\lambda \approx 1 + 0.2p \times 10^{-8}, \quad (4.3)$$

may be used where λ_p is the thermal conductivity at pressure p and λ is the thermal conductivity at a pressure of 10^5 N/m^2 ($\approx 1 \text{ atm}$), both at the same temperature.

5. EXPLANATION OF TABLES

The constants of Equation (4.2) are given in Table 7.1 and on the data sheets. Values of the thermal conductivity are given in the data sheets at 10 kelvin intervals in K and $^\circ\text{C}$, from within 10 kelvin of the melting temperature, or an appropriate starting temperature where the melting temperature is unknown, to a temperature corresponding with $T_r \approx 0.9$.

The sources are given in the data sheets and extrapolated values are indicated in parentheses.

For uniformity and ease of interpolation the data are presented and can be read to more significant digits than is warranted by their estimated accuracy.

The experimental data from the most reliable individual sources have a repeatability of about ± 1 per cent although differences in technique used by different workers (and possibly also in the purity of samples) can increase the uncertainty in the absolute values to about ± 2 per cent. However, such reliable data are not available for all the compounds considered, nor over the whole temperature range covered. Although it is considered that the correlation procedures adopted keep the errors in the values presented to a minimum, the user should in general allow for an uncertainty of ± 5 per cent unless the value in the data sheet is truncated to a whole number. Where whole numbers are given the uncertainty increases to ± 10 per cent.

Some fluids have poor thermal stability coupled with a high critical temperature. Values have been tabulated for all fluids up to $T_r \approx 0.9$ but many of these fluids will decompose at elevated temperatures. As most compounds will decompose rapidly at temperatures above about 300°C , uncertainties of greater than ± 10 per cent may occur for temperatures $\geq 573 \text{ K}$.

6. REFERENCES

The references given are recommended sources of information supplementary to that in this Item.

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10. ESDU Vapour pressures and critical points of liquids: C₁₀ to C₂₄ alkanes. Data Item 85002, ESDU International plc, London, UK, 1985.
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7. TABLES

TABLE 7.1 Constants for Equation (4.2)

Compound	T_c	A	B	C	D	Range of Applicability °C
	K	mW/m K				
1. Methane	190.55	52.8	6.00	-17.00	18.00	-180 to -100
2. Ethane	305.33	54.2	5.00	-14.00	15.00	-190 to 0
3. Propane	369.85	47.2	4.20	-11.60	12.60	-190 to 60
4. Butane	425.25	46.0	3.68	-10.05	11.05	-140 to 110
5. 2-Methylpropane	407.85	41.2	3.68	-10.05	11.05	-160 to 100
6. Pentane	469.80	45.7	3.44	-9.32	10.32	-130 to 150
7. 2-Methylbutane	460.45	42.2	3.44	-9.32	10.32	-160 to 140
8. 2,2-Dimethylpropane	433.75	38.2	3.44	-9.32	10.32	-20 to 120
9. Hexane	507.90	45.4	3.21	-8.63	9.63	-100 to 190
10. 2-Methylpentane	497.85	41.9	3.21	-8.63	9.63	-160 to 180
11. 3-Methylpentane	504.45	41.9	3.21	-8.63	9.63	-120 to 180
12. 2,2-Dimethylbutane	489.35	37.7	3.21	-8.63	9.63	-100 to 170
13. 2,3-Dimethylbutane	500.25	39.9	3.21	-8.63	9.63	-130 to 180
14. Heptane	540.15	46.0	3.00	-7.99	8.99	-90 to 220
15. 2-Methylhexane	530.35	42.3	3.00	-7.99	8.99	-120 to 210
16. 3-Methylhexane	535.25	42.3	3.00	-7.99	8.99	-170 to 210
17. 3-Ethylpentane	540.65	42.3	3.00	-7.99	8.99	-120 to 220
18. 2,2-Dimethylpentane	520.55	38.1	3.00	-7.99	8.99	-130 to 200
19. 2,3-Dimethylpentane	537.35	39.7	3.00	-7.99	8.99	-120 to 220
20. 2,4-Dimethylpentane	519.75	39.7	3.00	-7.99	8.99	-120 to 200
21. 3,3-Dimethylpentane	536.35	38.1	3.00	-7.99	8.99	-140 to 210
22. 2,2,3-Trimethylbutane	531.15	36.5	3.00	-7.99	8.99	-30 to 210
23. Octane	568.95	46.2	2.79	-7.38	8.38	-60 to 250
24. 2-Methylheptane	559.65	42.9	2.79	-7.38	8.38	-110 to 240
25. 3-Methylheptane	563.65	42.9	2.79	-7.38	8.38	-120 to 240
26. 4-Methylheptane	561.75	42.9	2.79	-7.38	8.38	-120 to 240
27. 3-Ethylhexane	565.45	42.9	2.79	-7.38	8.38	-120 to 240
28. 2,2-Dimethylhexane	549.85	38.1	2.79	-7.38	8.38	-120 to 230
29. 2,3-Dimethylhexane	563.45	39.8	2.79	-7.38	8.38	-120 to 240
30. 2,4-Dimethylhexane	553.55	39.8	2.79	-7.38	8.38	-120 to 230
31. 2,5-Dimethylhexane	550.05	39.8	2.79	-7.38	8.38	-90 to 230
32. 3,3-Dimethylhexane	562.05	38.1	2.79	-7.38	8.38	-130 to 240
33. 3,4-Dimethylhexane	568.85	39.8	2.79	-7.38	8.38	-120 to 240
34. 2-Methyl-3-ethylpentane	567.05	39.8	2.79	-7.38	8.38	-120 to 240
35. 3-Methyl-3-ethylpentane	576.55	38.1	2.79	-7.38	8.38	-90 to 250
36. 2,2,3-Trimethylpentane	563.55	36.4	2.79	-7.38	8.38	-110 to 240
37. 2,2,4-Trimethylpentane	543.85	36.4	2.79	-7.38	8.38	-110 to 220
38. 2,3,3-Trimethylpentane	573.55	36.4	2.79	-7.38	8.38	-100 to 250
39. 2,3,4-Trimethylpentane	566.45	38.7	2.79	-7.38	8.38	-110 to 240
40. 2,2,3,3-Tetramethylbutane	568.15	35.0	2.79	-7.38	8.38	100 to 250

TABLE 7.1 Constants for Equation (4.2)

Compound	T_c	A	B	C	D	Range of Applicability	
	K	mW/m K				°C	
41. Nonane	594.65	47.0	2.61	-6.83	7.83	-50 to	270
42. 2-Methyloctane	586.75	43.2	2.61	-6.83	7.83	-80 to	260
43. 2,2-Dimethylheptane	576.75	38.8	2.61	-6.83	7.83	-110 to	250
44. 2,2,5-Trimethylhexane	572.15	37.1	2.61	-6.83	7.83	-110 to	250
45. 2,3,5-Trimethylhexane	579.15	39.4	2.61	-6.83	7.83	-130 to	250
46. 2,4,4-Trimethylhexane	582.15	37.1	2.61	-6.83	7.83	-110 to	260
47. 3,3-Diethylpentane	609.15	38.8	2.61	-6.83	7.83	-30 to	280
48. 2,2,3,3-Tetramethylpentane	607.65	35.6	2.61	-6.83	7.83	-10 to	280
49. 2,2,3,4-Tetramethylpentane	592.75	35.6	2.61	-6.83	7.83	-120 to	270
50. 2,2,4,4-Tetramethylpentane	574.75	35.6	2.61	-6.83	7.83	-70 to	250
51. 2,3,3,4-Tetramethylpentane	607.65	35.6	2.61	-6.83	7.83	-100 to	280
52. Decane	617.65	48.3	2.44	-6.31	7.31	-30 to	290
53. 3,3,5-Trimethylheptane	609.65	36.6	2.44	-6.31	7.31	-70 to	280
54. 2,2,3,3-Tetramethylhexane	623.15	36.6	2.44	-6.31	7.31	-60 to	290
55. 2,2,5,5-Tetramethylhexane	581.55	36.6	2.44	-6.31	7.31	-10 to	260
56. Undecane	638.85	49.4	2.28	-5.84	6.84	-30 to	310
57. 2-Methyldecane	632.15	45.4	2.28	-5.84	6.84	-50 to	300
58. Dodecane	658.65	50.6	2.14	-5.41	6.41	-10 to	320
59. Tridecane	676.15	52.2	2.01	-5.02	6.00	-10 to	340
60. Tetradecane	693.15	53.2	1.89	-4.68	5.68	0 to	360
61. Pentadecane	708.15	54.5	1.79	-4.38	5.38	10 to	370
62. Hexadecane	722.15	55.8	1.71	-4.12	5.12	20 to	380
63. 2-Methylpentadecane	716.15	51.2	1.71	-4.12	5.12	-10 to	380
64. 3-Methylpentadecane	719.15	51.2	1.71	-4.12	5.12	-20 to	380
65. 4-Methylpentadecane	716.15	51.2	1.71	-4.12	5.12	-20 to	380
66. 5-Methylpentadecane	715.15	51.2	1.71	-4.12	5.12	-30 to	380
67. 6-Methylpentadecane	714.15	51.2	1.71	-4.12	5.12	-30 to	380
68. 7-Methylpentadecane	714.15	51.2	1.71	-4.12	5.12	-30 to	380
69. 8-Methylpentadecane	713.15	51.2	1.71	-4.12	5.12	-30 to	380
70. 3-Ethyltetradecane	718.15	51.2	1.71	-4.12	5.12	-30 to	380
71. 4-Propyltridecane	709.15	51.2	1.71	-4.12	5.12	-40 to	370
72. 5-Butyldodecane	705.15	51.2	1.71	-4.12	5.12	-50 to	360
73. 6-Pentylundecane	703.15	51.2	1.71	-4.12	5.12	-40 to	370
74. 2,2,4,4,6,8,8-Heptamethylnonane	692.	37.1	1.71	-4.12	5.12	-110 to	360
75. Heptadecane	736.15	57.1	1.64	-3.91	4.91	20 to	400
76. Octadecane	749.15	58.1	1.58	-3.74	4.74	30 to	410
77. Nonadecane	761.15	58.7	1.54	-3.61	4.61	30 to	420
78. Eicosane	771.15	59.2	1.51	-3.52	4.52	30 to	430
79. Heneicosane	781.15	59.7	1.49	-3.48	4.48	40 to	440
80. Docosane	790.15	60.0	1.49	-3.48	4.48	40 to	440
81. Tricosane	800.15	60.0	1.51	-3.53	4.53	50 to	450
82. Tetracosane	809.15	60.0	1.54	-3.61	4.61	50 to	460

CH₄ METHANE

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 190.55$ K

$A = 52.8$, $B = 6.00$, $C = -17.00$, $D = 18.00$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
90	224.2	140	137.9	-180	218.1	-130	133.4
100	205.1	150	124.2	-170	199.2	-120	120.3
110	186.7	160	112.4	-160	181.2	-110	109.1
120	169.3	170	102.7	-150	164.1	-100	100.2
130	153.0			-140	148.1		

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C₂H₆ ETHANE

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 305.33 \text{ K}$$

$$A = 54.2, \quad B = 5.00, \quad C = -14.00, \quad D = 15.00$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
80	(279.4)	180	170.2	-190	(275.7)	-90	167.2
90	(267.6)	190	160.7	-180	(263.9)	-80	157.8
100	(255.9)	200	151.5	-170	(252.3)	-70	148.7
110	(244.4)	210	142.7	-160	240.9	-60	140.0
120	233.2	220	134.2	-150	229.6	-50	131.7
130	222.1	230	126.3	-140	218.6	-40	123.9
140	211.2	240	118.8	-130	207.8	-30	116.6
150	200.6	250	111.9	-120	197.3	-20	109.9
160	190.2	260	105.6	-110	187.0	-10	103.8
170	180.1	270	100.1	-100	176.9	0	98.6

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CH₃CH₂CH₃ PROPANE

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 369.85$ K

$A = 47.2$, $B = 4.20$, $C = -11.60$, $D = 12.60$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
80	(230.6)	210	141.1	-190	(228.3)	-60	139.2
90	(223.2)	220	135.1	-180	(220.9)	-50	133.2
100	(215.8)	230	129.1	-170	(213.5)	-40	127.3
110	(208.6)	240	123.4	-160	206.3	-30	121.6
120	201.4	250	117.8	-150	199.1	-20	116.1
130	194.3	260	112.4	-140	192.0	-10	110.7
140	187.2	270	107.2	-130	185.1	0	105.6
150	180.3	280	102.2	-120	178.2	10	100.7
160	173.5	290	97.5	-110	171.4	20	96.0
170	166.8	300	93.0	-100	164.7	30	91.7
180	160.2	310	88.9	-90	158.1	40	87.6
190	153.7	320	85.1	-80	151.7	50	83.9
200	147.4	330	81.6	-70	145.4	60	80.6

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CH₃[CH₂]₂CH₃ BUTANE (n-BUTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 425.25$ K

$A = 46.0$, $B = 3.68$, $C = -10.05$, $D = 11.05$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
130	(186.3)	260	120.9	-140	184.6	-10	119.5
140	180.9	270	116.4	-130	179.2	0	115.0
150	175.5	280	112.1	-120	173.8	10	110.7
160	170.2	290	107.8	-110	168.5	20	106.5
170	164.9	300	103.7	-100	163.3	30	102.4
180	159.7	310	99.7	-90	158.1	40	98.5
190	154.6	320	95.8	-80	153.0	50	94.7
200	149.6	330	92.2	-70	148.0	60	91.0
210	144.6	340	88.6	-60	143.0	70	87.5
220	139.7	350	85.3	-50	138.1	80	84.3
230	134.8	360	82.1	-40	133.3	90	81.2
240	130.1	370	79.2	-30	128.6	100	78.3
250	125.4	380	76.5	-20	124.0	110	75.7

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$(\text{CH}_3)_3\text{CH}$ 2-METHYLPROPANE (ISOBUTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 407.85$ K

$A = 41.2$, $B = 3.68$, $C = -10.05$, $D = 11.05$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
110	(174.)	250	108.0	-160	(173.)	-20	106.7
120	169.	260	103.8	-150	168.	-10	102.5
130	164.	270	99.8	-140	162.6	0	98.5
140	159.1	280	95.8	-130	157.6	10	94.6
150	154.1	290	92.0	-120	152.6	20	90.8
160	149.2	300	88.3	-110	147.7	30	87.2
170	144.3	310	84.8	-100	142.8	40	83.7
180	139.5	320	81.4	-90	138.0	50	80.3
190	134.8	330	78.1	-80	133.3	60	77.1
200	130.1	340	75.1	-70	128.7	70	74.2
210	125.5	350	72.2	-60	124.1	80	71.4
220	121.0	360	69.6	-50	119.6	90	68.8
230	116.6	370	67.2	-40	115.2	100	66.5
240	112.2			-30	110.9		

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CH₃[CH₂]₃CH₃ PENTANE (n-PENTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 469.80$ K

$A = 45.7$, $B = 3.44$, $C = -9.32$, $D = 10.32$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	180.	290	115.8	-130	179.	20	114.6
150	175.	300	112.0	-120	174.0	30	110.9
160	170.9	310	108.3	-110	169.4	40	107.2
170	166.3	320	104.7	-100	164.9	50	103.6
180	161.8	330	101.2	-90	160.4	60	100.1
190	157.4	340	97.7	-80	156.0	70	96.7
200	152.9	350	94.4	-70	151.6	80	93.4
210	148.6	360	91.2	-60	147.2	90	90.2
220	144.3	370	88.1	-50	142.9	100	87.1
230	140.0	380	85.1	-40	138.7	110	84.2
240	135.8	390	82.2	-30	134.5	120	81.4
250	131.7	400	79.6	-20	130.4	130	78.7
260	127.6	410	77.0	-10	126.4	140	76.3
270	123.6	420	74.7	0	122.4	150	74.0
280	119.7			10	118.5		

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$(\text{CH}_3)_2\text{CHCH}_2\text{CH}_3$ 2-METHYLBUTANE (ISOPENTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 460.45 \text{ K}$$

$$A = 42.2, \quad B = 3.44, \quad C = -9.32, \quad D = 10.32$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
110	(178.)	270	(112.2)	-160	(177.)	0	(111.0)
120	(174.)	280	(108.5)	-150	(172.)	10	107.3
130	(169.)	290	104.9	-140	(168.)	20	103.8
140	(165.)	300	101.4	-130	(164.)	30	100.3
150	(161.)	310	(97.9)	-120	(159.)	40	(96.8)
160	(156.)	320	(94.5)	-110	(155.)	50	(93.5)
170	(152.)	330	(91.)	-100	(151.)	60	(90.)
180	(148.)	340	(88.)	-90	(147.)	70	(87.)
190	(144.)	350	(85.)	-80	(142.)	80	(84.)
200	(140.)	360	(82.)	-70	(138.)	90	(81.)
210	(136.)	370	(79.)	-60	(134.)	100	(78.)
220	(131.)	380	(77.)	-50	(130.2)	110	(76.)
230	(127.5)	390	(74.)	-40	(126.3)	120	(73.)
240	(123.6)	400	(72.)	-30	(122.3)	130	(71.)
250	(119.7)	410	(69.)	-20	(118.5)	140	(69.)
260	(115.9)			-10	(114.7)		

FILIPPOV, L.P.

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Collect. Czech. Chem. Commun., Vol. 25, pp. 993-999, 1960.

$(\text{CH}_3)_4\text{C}$ 2,2-DIMETHYLPROPANE (NEOPENTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 433.75 \text{ K}$$

$$A = 38.2, \quad B = 3.44, \quad C = -9.32, \quad D = 10.32$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
250	(103.)	330	(77.)	-20	(102.)	60	(76.)
260	(100.)	340	(74.)	-10	(98.4)	70	(73.)
270	(96.0)	350	(71.)	0	(94.9)	80	(71.)
280	(92.6)	360	(69.)	10	(91.6)	90	(68.)
290	(89.3)	370	(66.)	20	(88.3)	100	(66.)
300	(86.0)	380	(64.)	30	(85.0)	110	(63.)
310	(82.9)	390	(62.)	40	(81.9)	120	(61.)
320	(79.8)			50	(78.9)		

CH₃[CH₂]₄CH₃ HEXANE (*n*-HEXANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 507.90 \text{ K}$$

$$A = 45.4, \quad B = 3.21, \quad C = -8.63, \quad D = 9.63$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
170	(165.)	320	109.9	-100	(164.)	50	108.8
180	(161.)	330	106.6	-90	159.7	60	105.6
190	157.0	340	103.4	-80	155.8	70	102.4
200	153.1	350	100.2	-70	151.9	80	99.3
210	149.3	360	97.2	-60	148.1	90	96.2
220	145.5	370	94.2	-50	144.3	100	93.3
230	141.7	380	91.3	-40	140.5	110	90.4
240	138.0	390	88.5	-30	136.8	120	87.6
250	134.3	400	85.7	-20	133.1	130	84.9
260	130.7	410	83.1	-10	129.5	140	82.3
270	127.1	420	80.6	0	125.9	150	79.8
280	123.5	430	78.	10	122.4	160	77.
290	120.0	440	76.	20	118.9	170	75.
300	116.6	450	74.	30	115.5	180	73.
310	113.2	460	72.	40	112.1	190	71.

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(CH₃)₂CH[CH₂]₂CH₃ 2-METHYLPENTANE (ISOHEXANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 497.85$ K

$A = 41.9$, $B = 3.21$, $C = -8.63$, $D = 9.63$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
110	(174.)	290	108.9	-160	(173.)	20	107.9
120	(170.)	300	105.7	-150	(169.)	30	104.7
130	(166.)	310	102.5	-140	(165.)	40	101.5
140	(162.)	320	99.4	-130	(161.)	50	98.5
150	(158.)	330	96.4	-120	(157.)	60	95.4
160	(155.)	340	93.4	-110	(153.)	70	92.5
170	(151.)	350	90.5	-100	(150.)	80	89.6
180	(147.)	360	87.7	-90	(146.)	90	86.8
190	(144.)	370	84.9	-80	(142.)	100	84.1
200	(140.)	380	82.2	-70	(139.)	110	81.4
210	(136.)	390	79.7	-60	(135.)	120	78.9
220	(133.)	400	77.2	-50	(132.)	130	76.4
230	(129.)	410	74.8	-40	(128.)	140	74.1
240	(126.)	420	72.5	-30	(125.)	150	71.8
250	(122.)	430	70.3	-20	121.2	160	69.7
260	118.8	440	68.3	-10	117.8	170	67.7
270	115.5	450	66.4	0	114.4	180	65.9
280	112.2			10	111.1		

SAKIADIS, B.C.
COATES, J.

AIChEJ., Vol. 1, No. 3, pp. 275-288, 1955.

FILIPPOV, L.P.
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Zh. Fiz. Khim., Vol. 58, No. 5, pp. 1068-1071, 1984. (Eng. Trans.: *Russ. J. Phys. Chem.*, pp. 651-653.)

WATANABE, H.

J. Chem. Eng. Data, Vol. 48, No. 1, pp. 124-136, 2003.

$\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$ 3-METHYLPENTANE

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 504.45 \text{ K}$$

$$A = 41.9, \quad B = 3.21, \quad C = -8.63, \quad D = 9.63$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(159.)	310	103.8	-120	(158.)	40	102.8
160	(155.)	320	100.7	-110	(154.)	50	99.8
170	(152.)	330	97.7	-100	(151.)	60	96.8
180	(148.)	340	94.7	-90	(147.)	70	93.8
190	(144.)	350	91.8	-80	(143.)	80	90.9
200	(141.)	360	89.0	-70	(140.)	90	88.1
210	(137.)	370	86.2	-60	(136.)	100	85.4
220	(134.)	380	(83.6)	-50	(133.)	110	(82.7)
230	(130.)	390	(81.0)	-40	(129.)	120	(80.2)
240	(127.)	400	(78.5)	-30	(126.)	130	(77.7)
250	(123.)	410	(76.)	-20	(122.)	140	(75.)
260	(120.)	420	(74.)	-10	(119.)	150	(73.)
270	(117.)	430	(72.)	0	115.6	160	(71.)
280	113.4	440	(69.)	10	112.3	170	(69.)
290	110.1	450	(68.)	20	109.1	180	(67.)
300	106.9			30	105.9		

SAKIADIS, B.C.
COATES, J.

AIChEJ., Vol. 1, No. 3, pp. 275-288, 1955.

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Zh. Fiz. Khim., Vol. 58, No. 5, pp. 1068-1071, 1984. (Eng. Trans.: *Russ. J. Phys. Chem.*, pp. 651-653.)

WATANABE, H.

J. Chem. Eng. Data, Vol. 48, No. 1, pp. 124-136, 2003.

(CH₃)₃CCH₂CH₃ 2,2-DIMETHYLBUTANE (NEOHEXANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 489.35$ K

$A = 37.7$, $B = 3.21$, $C = -8.63$, $D = 9.63$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
170	(135.)	310	90.7	-100	(134.)	40	89.8
180	(131.)	320	(87.9)	-90	(130.)	50	(87.1)
190	(128.)	330	(85.2)	-80	(127.)	60	(84.3)
200	(125.)	340	(82.5)	-70	(124.)	70	(81.7)
210	(121.)	350	(79.9)	-60	(120.)	80	(79.1)
220	(118.)	360	(77.3)	-50	(117.)	90	(76.5)
230	(115.)	370	(74.9)	-40	(114.)	100	(74.1)
240	(112.)	380	(72.)	-30	(110.8)	110	(72.)
250	(108.7)	390	(70.)	-20	(107.7)	120	(69.)
260	105.6	400	(68.)	-10	104.6	130	(67.)
270	102.5	410	(66.)	0	101.5	140	(65.)
280	99.5	420	(64.)	10	98.5	150	(63.)
290	96.5	430	(62.)	20	95.6	160	(61.)
300	93.6	440	(60.)	30	92.7	170	(60.)

SAKIADIS, B.C.
COATES, J.

AIChEJ., Vol. 1, No. 3, pp. 275-288, 1955.

WATANABE, H.

J. Chem. Eng. Data, Vol. 48, No. 1, pp. 124-136, 2003.

$(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2$ 2,3-DIMETHYLBUTANE (DIISOPROPYL)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 500.25$ K

$A = 39.9$, $B = 3.21$, $C = -8.63$, $D = 9.63$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	(155.)	300	101.1	-130	(154.)	30	100.1
150	(151.)	310	98.1	-120	(150.)	40	97.1
160	(148.)	320	95.1	-110	(146.)	50	94.2
170	(144.)	330	92.2	-100	(143.)	60	91.3
180	(140.)	340	89.4	-90	(139.)	70	88.5
190	(137.)	350	86.6	-80	(136.)	80	85.8
200	(134.)	360	84.0	-70	(132.)	90	83.1
210	(130.)	370	81.3	-60	(129.)	100	80.5
220	(127.)	380	78.8	-50	(125.7)	110	78.0
230	(123.4)	390	76.3	-40	(122.3)	120	75.6
240	120.1	400	73.9	-30	119.0	130	73.2
250	116.8	410	71.7	-20	115.8	140	71.0
260	113.6	420	69.5	-10	112.6	150	68.8
270	110.4	430	67.4	0	109.4	160	66.8
280	107.2	440	65.	10	106.2	170	65.
290	104.1	450	(64.)	20	103.2	180	(63.)

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J. Chem. Eng. Data, Vol. 48, No. 1, pp. 124-136, 2003.

CH₃[CH₂]₅CH₃ HEPTANE (n-HEPTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 540.15$ K

$A = 46.0$, $B = 3.00$, $C = -7.99$, $D = 8.99$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
180	(162.)	340	108.7	-90	160.7	70	107.8
190	158.2	350	105.8	-80	157.1	80	104.9
200	154.7	360	102.9	-70	153.6	90	102.0
210	151.2	370	100.0	-60	150.1	100	99.1
220	147.7	380	97.2	-50	146.6	110	96.3
230	144.2	390	94.5	-40	143.2	120	93.6
240	140.8	400	91.8	-30	139.8	130	91.0
250	137.4	410	89.2	-20	136.4	140	88.4
260	134.1	420	86.7	-10	133.1	150	85.9
270	130.8	430	84.2	0	129.8	160	83.5
280	127.5	440	81.9	10	126.5	170	81.1
290	124.3	450	79.6	20	123.3	180	78.9
300	121.1	460	77.4	30	120.1	190	76.7
310	117.9	470	75.3	40	116.9	200	74.7
320	114.8	480	73.	50	113.9	210	73.
330	111.8	490	72.	60	110.8	220	71.

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$(\text{CH}_3)_2\text{CH}[\text{CH}_2]_3\text{CH}_3$ 2-METHYLHEXANE (ISOHEPTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 530.35$ K

$A = 42.3$, $B = 3.00$, $C = -7.99$, $D = 8.99$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(158.)	320	103.9	-120	(157.)	50	103.0
160	(154.)	330	101.1	-110	(153.)	60	100.2
170	(151.)	340	98.3	-100	(150.)	70	97.4
180	(148.)	350	95.5	-90	(146.6)	80	94.7
190	(144.3)	360	92.8	-80	(143.3)	90	92.0
200	(141.0)	370	90.2	-70	(140.0)	100	89.4
210	(137.8)	380	87.6	-60	(136.7)	110	86.8
220	(134.5)	390	85.1	-50	(133.5)	120	84.3
230	(131.3)	400	82.6	-40	(130.3)	130	81.9
240	(128.1)	410	80.3	-30	(127.1)	140	79.5
250	(125.0)	420	77.9	-20	124.0	150	77.2
260	121.8	430	75.7	-10	120.9	160	75.0
270	118.8	440	73.6	0	117.8	170	72.9
280	115.7	450	71.5	10	114.8	180	70.9
290	112.7	460	70.	20	111.8	190	69.
300	109.7	470	68.	30	108.8	200	67.
310	106.8	480	66.	40	105.9	210	65.

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J. Chem. Eng. Data, Vol. 48, No. 1, pp. 124-136, 2003.

$\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)[\text{CH}_2]_2\text{CH}_3$ 3-METHYLHEXANE

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 535.25 \text{ K}$$

$$A = 42.3, \quad B = 3.00, \quad C = -7.99, \quad D = 8.99$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
100	(176.)	300	110.5	-170	(174.)	30	109.6
110	(172.)	310	107.6	-160	(171.)	40	106.7
120	(169.)	320	104.8	-150	(167.)	50	103.9
130	(165.)	330	101.9	-140	(164.)	60	101.0
140	(162.)	340	99.1	-130	(161.)	70	98.3
150	(158.)	350	(96.4)	-120	(157.)	80	(95.6)
160	(155.)	360	(93.7)	-110	(154.)	90	(92.9)
170	(152.)	370	(91.1)	-100	(151.)	100	(90.3)
180	(148.)	380	(88.5)	-90	(147.)	110	(87.7)
190	(145.)	390	(86.0)	-80	(144.)	120	(85.2)
200	(142.)	400	(84.)	-70	(141.)	130	(83.)
210	(138.)	410	(81.)	-60	(137.)	140	(80.)
220	(135.)	420	(79.)	-50	(134.2)	150	(78.)
230	(132.0)	430	(77.)	-40	(131.0)	160	(76.)
240	(128.8)	440	(74.)	-30	(127.8)	170	(74.)
250	(125.7)	450	(72.)	-20	(124.7)	180	(72.)
260	122.6	460	(70.)	-10	121.6	190	(70.)
270	119.5	470	(68.)	0	118.6	200	(68.)
280	116.5	480	(67.)	10	115.5	210	(66.)
290	113.5			20	112.6		

WATANABE, H.

J. Chem. Eng. Data, Vol. 48, No. 1, pp. 124-136, 2003.

$(\text{CH}_3\text{CH}_2)_3\text{CH}$ 3-ETHYLPENTANE (TRIETHYLMETHANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 540.65 \text{ K}$

$A = 42.3$, $B = 3.00$, $C = -7.99$, $D = 8.99$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(159.)	330	102.9	-120	(158.)	60	102.0
160	(155.)	340	100.1	-110	(154.)	70	99.2
170	(152.)	350	97.4	-100	(151.)	80	96.5
180	(149.)	360	94.7	-90	(148.)	90	93.8
190	(146.)	370	92.1	-80	(145.)	100	91.2
200	(142.)	380	89.5	-70	(141.)	110	88.7
210	(139.)	390	87.0	-60	(138.)	120	86.2
220	(136.)	400	84.5	-50	(134.9)	130	83.7
230	(132.7)	410	82.1	-40	(131.7)	140	81.4
240	(129.6)	420	79.8	-30	(128.6)	150	79.1
250	(126.5)	430	77.5	-20	(125.5)	160	76.8
260	(123.4)	440	75.4	-10	(122.4)	170	74.7
270	(120.3)	450	73.3	0	(119.4)	180	72.6
280	(117.3)	460	71.3	10	116.4	190	70.7
290	114.4	470	69.4	20	113.4	200	68.8
300	111.4	480	68.	30	110.5	210	67.
310	108.5	490	66.	40	107.6	220	65.
320	105.7			50	104.8		

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