



3 4456 0555773 2

ORNL/TM-5847

Cy. 55

Thermodynamic Representations of Ammonia and Isobutane

S. L. Milora
S. K. Combs

OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
DOCUMENT COLLECTION

LIBRARY LOAN COPY

DO NOT TRANSFER TO ANOTHER PERSON

If you wish someone else to see this
document, send in name with document
and the library will arrange a loan.

UNCLASSIFIED
EX-100-100

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Contract No. W-7405-eng-26

Engineering Technology Division

THERMODYNAMIC REPRESENTATIONS OF AMMONIA AND ISOBUTANE

S. L. Milora and S. K. Combs

Date Published - May 1977

Prepared by
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

OAK RIDGE NATIONAL LABORATORY LIBRARIES



3 4456 0555773 2

CONTENTS

	<u>Page</u>
NOMENCLATURE	v
ABSTRACT	1
1. INTRODUCTION	1
2. THE THERMODYNAMIC REPRESENTATION	2
2.1 Superheated Vapor Conditions	2
2.2 Liquid-Vapor Equilibrium Conditions	5
2.2.1 Liquid density and vapor pressure equations	5
2.2.2 The latent heat of vaporization	5
2.3 The Ideal-Gas State	6
2.4 Derived Thermodynamic Properties	6
3. ESTIMATION OF ERRORS	7
3.1 Superheated Vapor and Dense Gaseous Regions	7
3.2 Vapor Pressure and Saturated Liquid Volume	19
4. THERMODYNAMIC PROPERTIES TABLES	23
REFERENCES	98

NOMENCLATURE

a, b, K	coefficients in the Martin-Hou equation
$B_i, C_i, f_i(1)$	coefficients in the Martin-Hou equation
C_p^*	ideal gas heat capacity function
$C_0^*, C_1^*, C_2^*, C_3^*$	ideal gas heat capacity coefficients
D_r, E_r, F_r, G_r, H_r	vapor pressure equation coefficients
h, H	specific enthalpy
P	pressure
R	gas constant
s, S	specific entropy
T	temperature
v, V	specific volume
Z	compressibility factor
ρ_l	liquid density
$\rho_1, \rho_2, \rho_3, \rho_4$	liquid density equation coefficients

Subscripts

c	pertaining to the thermodynamic critical point
f	saturated liquid
g	saturated vapor
fg	phase change property
r	reduced property

Superscripts

sat	pertaining to saturation conditions
-------	-------------------------------------

THERMODYNAMIC REPRESENTATIONS OF AMMONIA AND ISOBUTANE

S. L. Milora and S. K. Combs

ABSTRACT

Tables of the thermodynamic properties of ammonia and isobutane are presented for the superheated vapor and the saturated liquid and vapor states. The properties were calculated using appropriate analytical pressure-volume-temperature (P-V-T) representations for the fluids in the regions described.

The tables cover the approximate range of values of reduced temperatures up to 1.5 and reduced pressure up to 5.

1. INTRODUCTION

This report represents a compilation of the thermodynamic properties of ammonia and isobutane which have been calculated from analytic thermodynamic representations for the two fluids in the liquid-vapor equilibrium states and the superheated vapor and compressed gaseous regions. The equation of state upon which the formulation is based is a revised Martin-Hou representation¹ that is particularly well-suited to describing P-V-T behavior of fluids at supercritical pressures. This feature is important in some applications such as power cycle calculations for thermodynamic cycles employing supercritical pressure boilers.² The representations for both fluids described here are valid up to values of reduced pressures of about 5 and reduced temperatures of about 1.5, which is more than adequate for most applications. The subcooled liquid region is excluded, since both representations are inaccurate at values of reduced density greater than unity for temperatures less than the critical value.

2. THE THERMODYNAMIC REPRESENTATION

2.1 Superheated Vapor Conditions

In the superheated vapor and high density (supercritical) compressed gaseous regions, the P-V-T behavior of the fluids is described by the following dimensionless, or reduced, form of the relevant Martin-Hou equation:^{1,3}

$$P_r = \frac{P}{P_c} = Z_c^{-1} \left\{ \frac{T_r}{(v_r - b)} + \frac{f_1(T_r)}{(v_r - b)^2} + \frac{f_2(T_r)}{(v_r - b)^3} + \frac{f_3(T_r)}{(v_r - b)^4} + \frac{f_4(T_r)}{(v_r - b)^5} + f_5(T_r) e^{-av_r} + f_6(T_r) e^{-2av_r} \right\}, \quad (1)$$

where $P_r = P/P_c$, $T_r = T/T_c$, and $v_r = v/v_c$ represent, respectively, reduced values of pressure, temperature, and specific volume. The subscript c pertains to values at the thermodynamic critical point, and Z_c is the critical compressibility factor defined as $Z_c = (P_c v_c)/RT_c$, where R is the fluid specific gas constant in consistent units. The temperature functions of Eq. (1) [which are related to the virial coefficients] are written in the following dimensionless form:

$$f_i(T_r) = f_i(1) + B_i(T_r - 1) + C_i(e^{-KT_r} - e^{-K}), \quad (2)$$

where B_i , C_i , and K are constants and $f_i(1)$ represents the value of the relevant temperature function evaluated at the critical temperature.

Milora^{3,4} has determined values of the parameters $f_i(1)$, B_i , C_i , K, a, and b for ammonia and isobutane by using a nonlinear least-squares algorithm to fit the available P-V-T data. The results are listed in Tables 1 and 2 along with other pertinent physical constants.

Table 1. Equation-of-state parameters for ammonia

Physical constants:

Critical temperature	= 405.44 K (270.12°F)
Critical pressure	= 1.1278×10^7 Pa (111.3 atm)
Critical volume	= $4.247 \text{ cm}^3/\text{g}$ ($0.06804 \text{ ft}^3/\text{lb}_m$)
Critical compressibility factor	= 0.242
Molecular weight	= 17.032
Gas constant, R	= 0.488 kJ/kg · K

Reduced equation-of-state parameters (from Ref. 3):

$f_1(1) = -1.545953$	$f_4(1) = -4.589757 \times 10^{-2}$
$b_1 = 1.6586084$	$B_4 = -1.9943707$
$C_1 = -8.1254057 \times 10^1$	$C_4 = -3.2302139 \times 10^2$
$f_2(1) = 1.022201$	$f_5(1) = 1.741376 \times 10^3$
$B_2 = -3.7680776$	$B_5 = 2.56467 \times 10^4$
$C_2 = -2.454404 \times 10^2$	$C_5 = 4.294690 \times 10^6$
$f_3(1) = -1.891483 \times 10^{-1}$	$f_6(1) = 1.803382 \times 10^5$
$B_3 = 4.9243365$	$B_6 = -7.22990 \times 10^6$
$C_3 = 6.4752053 \times 10^2$	$C_6 = -9.57130 \times 10^8$

$$\begin{aligned} a &= 14.33333 \\ b &= 0.01833333 \\ K &= 6.42419 \end{aligned}$$

Ideal-gas heat capacity coefficients (reduced):

$C_0^* = 4.30317$	$C_2^* = 3.1995$
$C_1^* = -1.84109$	$C_3^* = -0.982953$

$$C_p^*/R = C_0^* + C_1^* T_r + C_2^* T_r^2 + C_3^* T_r^3$$

Liquid density equation coefficients (reduced):

$\rho_1 = 1.5489388$	$\rho_3 = -1.5957075$
$\rho_2 = 1.9710952$	$\rho_4 = 1.0321973$

$$\rho_l \Big|_r^{\text{sat}} = 1 + \rho_1 (1 - T_r)^{1/3} + \rho_2 (1 - T_r)^{2/3} + \rho_3 (1 - T_r) + \rho_4 (1 - T_r)^{4/3}$$

Vapor pressure equation coefficients (reduced):

$D_r = 7.3672454$	$F_r = 8.5673754$
$E_r = 10.883945$	$G_r = -2.4647451$

$$H_r = 1.0519545$$

$$\log P \Big|_r^{\text{sat}} = D_r - E_r/T_r - F_r \ln T_r - G_r T_r + H_r T_r^2$$

Table 2. Equation-of-state parameters for isobutane

Physical constants:

Critical temperature	= 408.13 K (274.96°F)
Critical pressure	= 3.6477×10^6 Pa (529.06 psia)
Critical volume	= $4.522 \text{ cm}^3/\text{g}$ ($0.07244 \text{ ft}^3/\text{lb}_m$)
Critical compressibility factor	= 0.28255
Molecular weight	= 58.134
Gas constant, R	= 0.143 kJ/kg·K

Reduced equation-of-state parameters (from Ref. 4):

$f_1(1) = -1.3452811$	$f_4(1) = -3.6735063 \times 10^{-3}$
$B_1 = 5.6584041 \times 10^{-1}$	$B_4 = 6.7988776 \times 10^{-2}$
$C_1 = -1.2094862 \times 10^1$	$C_4 = -1.3506749$
$f_2(1) = 8.1331706 \times 10^{-1}$	$f_5(1) = 7.3698560 \times 10^3$
$B_2 = 1.9346061 \times 10^{-1}$	$B_5 = -1.6476544 \times 10^4$
$C_2 = 1.5083697 \times 10^1$	$C_5 = 2.0091059 \times 10^5$
$f_3(1) = -1.8209186 \times 10^{-1}$	$f_6(1) = 4.1434338 \times 10^6$
$B_3 = -1.8524754 \times 10^{-1}$	$B_6 = 1.4277603 \times 10^7$
$C_3 = -2.0223683$	$C_6 = 5.4888339 \times 10^8$

$$\begin{aligned} a &= 16.024343 \\ b &= 0.14926478 \\ K &= 3.9676634 \end{aligned}$$

Ideal-gas heat capacity coefficients (reduced):

$C_0^* = -0.95123056$	$C_2^* = -4.60664$
$C_1^* = 20.4097$	$C_3^* = 0.407839$

$$C_p^*/R = C_0^* + C_1^* T_r + C_2^* T_r^2 + C_3^* T_r^3$$

Liquid density equation coefficients (reduced):

$\rho_1 = 1.17235$	$\rho_3 = -7.50585$
$\rho_2 = 4.61147$	$\rho_4 = 4.76730$

$$\rho_l)_r^{\text{sat}} = 1 + \rho_1(1 - T_r)^{1/3} + \rho_2(1 - T_r)^{2/3} + \rho_3(1 - T_r) + \rho_4(1 - T_r)^{4/3}$$

Vapor pressure equation coefficients (reduced):

$D_r = 10.890498$	$F_r = 2.6561239$
$E_r = 8.7655777$	$G_r = 4.7799233$

$$H_r = 2.6550034$$

$$\log P)_r^{\text{sat}} = D_r - E_r/T_r - F_r \ln T_r - G_r T_r + H_r T_r^2$$

2.2 Liquid-Vapor Equilibrium Conditions

2.2.1 Liquid density and vapor pressure equations

The following standard forms were chosen to represent the saturated reduced liquid density and the reduced vapor pressure, respectively:

$$\rho_{\ell} \Big|_r^{\text{sat}} = 1 + \rho_1 (1 - T_r)^{1/3} + \rho_2 (1 - T_r)^{2/3} + \rho_3 (1 - T_r) + \rho_4 (1 - T_r)^{4/3}, \quad (3)$$

$$\log P \Big|_r^{\text{sat}} = D_r - E_r/T_r - F_r \ln T_r - G_r T_r + H_r T_r^2. \quad (4)$$

The form of Eq. (3) is consistent with the definition of the critical point; i.e., $\rho_r = 1$ at $T_r = 1$. Consistency is forced on Eq. (4) by requiring that $P_r = 1$ at $T_r = 1$. Values of the coefficients of Eqs. (3) and (4) as determined by a least-squares fit to the data are presented in Tables 1 and 2.

2.2.2 The latent heat of vaporization

The latent heat of vaporization, h_{fg} , is calculated from the Clapeyron equation using the preceding results. In terms of reduced variables, the expression for h_{fg} becomes

$$\frac{h_{fg}}{RT_c} = Z_c T_r (v_g - v_f) \Big|_r^{\text{sat}} \frac{dp_r^{\text{sat}}}{dT_r}, \quad (5)$$

with

$$v_g \Big|_r^{\text{sat}} = 1/\rho_{\ell} \Big|_r^{\text{sat}}.$$

The subscripts g and f refer to the gaseous and liquid states, respectively. It follows that the entropy variation, s_{fg} , during the phase change is given by

$$\frac{s_{fg}}{R} = \frac{h_{fg}}{RT_c T_r}. \quad (6)$$

2.3 The Ideal-Gas State

The properties of the gas at large values of reduced volume are required to complete the thermodynamic representation. In the limit $v_r \rightarrow \infty$, Eq. (1) becomes

$$p_r = \frac{1}{Z_c} \frac{T_r}{v_r}, \quad (7)$$

which is the reduced form of the ideal-gas law. In this dilute state the enthalpy is a function only of temperature, as is the constant pressure specific heat function C_p^* . The latter is represented accurately over the temperature range of interest by a simple polynomial function

$$\frac{C_p^*}{R} = C_0^* + C_1^* T_r + C_2^* T_r^2 + C_3^* T_r^3. \quad (8)$$

The relevant dimensionless coefficients are given in Tables 1 and 2.

2.4 Derived Thermodynamic Properties

The derived thermodynamic properties, including enthalpy and entropy, are expressible as algebraic relationships involving the primary thermodynamic variables, the equation-of-state parameters, and the ideal-gas specific heat coefficients. For changes in the values of enthalpy and entropy between the state points P_1, T_1 and P_2, T_2 , the following expressions apply:³

$$\begin{aligned} \frac{h_2(P_2, T_2) - h_1(P_1, T_1)}{RT_c} &= \left\{ C_0^* T_r + C_1^* \frac{T_r^2}{2} + C_2^* \frac{T_r^3}{3} + C_3^* \frac{T_r^4}{4} \right\} \bigg|_{T_{r1}}^{T_{r2}} \\ &+ \left\{ Z_c P_r v_r - T_r + \sum_{i=1}^4 \frac{f_i(1) - B_i + C_i [(1 + KT_r) e^{-KT_r} - e^{-K}]}{i(v_r - b)^i} \right. \\ &+ \left. \frac{f_5(1) - B_5 + C_5 [(1 + KT_r) e^{-KT_r} - e^{-K}]}{a e^{av_r}} \right\} \end{aligned} \quad (9)$$

[continued]

$$+ \frac{f_6(1) - B_6 + C_6[(1 + KT_r) e^{-KT_r} - e^{-K}]}{2a e^{2av_r}} \left\{ \begin{array}{c} v_{r_2}, T_{r_2} \\ v_{r_1}, T_{r_1} \end{array} \right\} \quad (9)$$

$$\begin{aligned} \frac{s_2 - s_1}{R} = & \left\{ C_0^* \ln T_r + C_1^* T_r + C_2^* \frac{T_r^2}{2} + C_3^* \frac{T_r^3}{3} - \ln P_r \right\} \left| \begin{array}{c} P_{r_2}, T_{r_2} \\ P_{r_1}, T_{r_1} \end{array} \right. \\ & - \left\{ \ln \frac{T_r}{(v_r - b) P_r Z_c} + \sum_{i=1}^4 \frac{B_i - C_i K e^{-KT_r}}{i(v_r - b)^i} \right. \\ & \left. + \frac{B_5 - C_5 K e^{-KT_r}}{a e^{av_r}} + \frac{B_6 - C_6 K e^{-KT_r}}{2a e^{2av_r}} \right\} \left| \begin{array}{c} T_{r_2}, v_r(T_{r_2}, P_{r_2}) \\ T_{r_1}, v_r(T_{r_1}, P_{r_1}) \end{array} \right. \quad (10) \end{aligned}$$

3. ESTIMATION OF ERRORS

3.1 Superheated Vapor and Dense Gaseous Regions

A detailed discussion of the accuracy of the P-V-T representation for ammonia appears in an earlier report by Milora.³ Tables 3, 4, and 5, which are taken from that work, summarize the comparison of the representation with the data of several authors. The largest discrepancies are confined to a small region in the vicinity of the critical point, where experimental errors are frequently large. Outside of this region, the errors are small — typically of the order of a few tenths of a percent or less.

A partial listing of the errors encountered in the isobutane representation is given in Table 6 for selected isotherms. Again, the largest discrepancies occur along the isotherm nearest the critical temperature; however, the errors are typically greater in magnitude than those experienced for ammonia. As is true for ammonia, the P-V-T domain external to this region is represented accurately.

Table 3. Results of ammonia P-V-T representation: Comparison with data of Davies⁵

T, K	v, cm ³ /g	P _{exp} , Pa X 10 ⁻⁵	P _{cal} , Pa X 10 ⁻⁵	(ΔP/P) X 100	h _{exp} , kJ/kg	h _{cal} , kJ/kg	(Δh/h) X 100
360	164.3	10.133	10.124	-0.08	1630.1	1629.4	-0.04
360	77.0	20.265	20.263	-0.01	1593.2	1590.8	-0.16
360	32.3	40.530	40.563	0.08	1494.2	1492.0	-0.15
400	185.9	10.133	10.130	-0.03	1729.3	1727.7	-0.09
400	89.3	20.265	20.267	0.01	1703.8	1700.5	-0.19
400	40.8	40.530	40.494	-0.09	1644.1	1640.2	-0.24
400	24.1	60.795	60.804	0.15	1572.6	1567.4	-0.33
400	15.4	81.061	80.793	-0.33	1479.3	1472.9	-0.43
400	8.1	101.330	101.530	0.20	1267.5	1279.3	0.93
420	95.1	20.265	20.267	0.01	1755.4	1752.4	-0.14
420	44.3	40.530	40.519	-0.03	1704.8	1702.2	-0.15
420	27.1	60.795	60.800	0.01	1649.3	1644.9	-0.26
420	18.2	81.060	81.230	0.21	1586.6	1577.5	-0.57
420	13.0	101.330	100.050	-1.26	1508.3	1501.4	-0.46
420	5.00	141.860	139.110	-1.93	1196.5	1196.1	-0.04
420	2.82	182.390	183.240	0.47	988.7	979.0	-0.98
420	2.48	243.180	242.320	-0.36	936.9	928.3	-0.91
420	2.28	324.240	328.310	1.25	909.1	898.5	-1.17
420	2.18	405.300	409.440	1.02	895.6	884.4	-1.25
480	227.0	10.133	10.138	0.06	1926.3	1924.6	-0.09
480	111.4	20.265	20.278	0.06	1910.1	1907.7	-0.13
480	53.6	40.530	40.560	0.07	1876.7	1873.0	-0.19
480	34.3	60.795	60.819	0.04	1841.8	1837.1	-0.26
480	24.6	81.061	81.019	-0.05	1805.5	1799.9	-0.31
480	18.8	101.330	100.930	-0.39	1767.7	1761.5	-0.35
480	12.0	141.860	141.120	-0.52	1683.4	1677.7	-0.34
480	8.12	182.390	182.120	-0.15	1588.6	1582.8	-0.39
480	5.02	243.180	243.760	0.24	1439.7	1437.3	-0.16
480	3.50	324.240	323.680	-0.17	1307.3	1309.6	0.17
480	2.93	405.300	408.010	0.67	1241.0	1243.9	0.23

Table 4. Results of ammonia P-V-T representation: Comparison with data of Beattie and Lawrence⁶

T, K	v, cm ³ /g	P _{exp} , Pa X 10 ⁻⁵	P _{cal} , Pa X 10 ⁻⁵	(ΔP/P) X 100	h _{exp} , ^a kJ/kg	h _{cal} , kJ/kg	(Δh/h) X 100 ^a
323.1	90	15.250	15.254	0.03	—	1506.2	—
323.1	70	18.786	18.796	0.06	—	1483.9	—
373.1	90	18.482	18.470	-0.06	—	1634.1	—
373.1	70	23.143	23.122	-0.09	—	1617.6	—
373.1	50	30.874	30.831	-0.14	—	1588.1	—
373.1	40	36.954	36.903	-0.13	—	1562.6	—
373.1	30	45.789	45.708	-0.18	—	1521.0	—
373.1	20	59.053	58.846	-0.35	—	1440.6	—
398.1	90	20.012	20.007	-0.02	—	1696.2	—
398.1	70	25.179	25.163	-0.06	—	1681.5	—
398.1	50	33.883	33.852	-0.09	—	1655.3	—
398.1	40	40.895	40.856	-0.10	—	1632.8	—
398.1	30	51.413	51.356	-0.11	—	1596.2	—
398.1	20	68.456	68.368	-0.13	—	1526.0	—
423.1	90	21.514	21.517	0.02	—	1758.1	—
423.1	70	27.165	27.158	-0.02	—	1744.7	—
423.1	50	36.812	36.779	-0.09	—	1721.0	—
423.1	40	44.695	44.655	-0.09	—	1700.7	—
423.1	30	56.753	56.720	-0.06	—	1667.7	—
423.1	20	77.251	77.232	-0.02	—	1604.9	—

Table 4 (Continued)

T, K	v, cm ³ /g	P _{exp} , Pa × 10 ⁻⁵	P _{cal} , Pa × 10 ⁻⁵	(ΔP/P) × 100	h _{exp} , ^a kJ/kg	h _{cal} , kJ/kg	(Δh/h) × 100 ^a
473.1	90	24.470	24.486	0.06	—	1882.6	—
473.1	70	31.046	31.064	0.06	—	1871.0	—
473.1	50	42.445	42.460	0.03	—	1850.5	—
473.1	40	51.970	51.976	0.01	—	1833.1	—
473.1	30	66.926	66.942	0.02	—	1804.9	—
473.1	20	93.797	93.776	-0.02	—	1751.6	—
523.1	90	27.368	27.420	0.19	—	2009.7	—
523.1	70	34.846	34.911	0.19	—	1999.2	—
523.1	50	47.957	48.019	0.13	—	1980.7	—
523.1	40	59.032	59.104	0.12	—	1964.9	—
523.1	30	76.744	76.805	0.08	—	1939.5	—
523.1	20	109.614	109.486	-0.12	—	1891.7	—
573.1	90	30.236	30.338	0.34	—	2140.0	—
573.1	70	38.585	38.731	0.38	—	2130.5	—
573.1	50	53.318	53.525	0.39	—	2113.3	—
573.1	40	65.892	66.144	0.38	—	2098.7	—
573.1	30	86.218	86.506	0.33	—	2075.1	—
573.1	20	124.732	124.818	0.07	—	2030.6	—

^aData not given.

Table 5. Results of ammonia P-V-T representation: Comparison with NBS Data⁷

T, K	v, cm ³ /g	P _{exp} , Pa × 10 ⁻⁵	P _{cal} , Pa × 10 ⁻⁵	(ΔP/P) × 100	h _{exp} , kJ/kg	h _{cal} , kJ/kg	(Δh/h) × 100
299.8	338.9	4.137	4.133	-0.09	1512.5	1510.5	-0.13
299.8	160.8	8.274	8.278	0.04	1483.7	1483.7	-0.00
344.2	396.5	4.137	4.131	-0.14	1616.6	1613.8	-0.17
344.2	192.8	8.274	8.267	-0.09	1600.1	1597.4	-0.16
344.2	124.8	12.411	12.403	-0.06	1582.9	1580.1	-0.18
344.2	90.6	16.548	16.538	-0.06	1564.6	1561.6	-0.19
344.2	70.1	20.684	20.647	-0.17	1545.0	1541.8	-0.21
388.7	451.9	4.137	4.132	-0.12	1719.4	1716.5	-0.17
388.7	222.1	8.274	8.268	-0.06	1708.2	1705.2	-0.18
388.7	145.3	12.411	12.415	0.03	1697.0	1693.5	-0.22
388.7	107.0	15.548	15.558	0.06	1685.4	1681.4	-0.24
388.7	84.0	20.684	20.690	0.03	1673.6	1669.0	-0.27
422.0	492.7	4.137	4.132	-0.12	1797.5	1794.7	-0.15
422.0	243.2	8.274	8.271	-0.03	1788.9	1785.5	-0.19
422.0	159.9	12.411	12.423	0.09	1780.0	1776.2	-0.21
422.0	118.3	16.548	16.574	0.16	1771.2	1766.7	-0.25
422.0	93.4	20.684	20.720	0.17	1762.1	1757.0	-0.28

Table 6. Results of isobutane P-V-T representation: Comparison with data of Canjar and Manning⁸

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
20.00	88.360	1.000	1.000	-0.03	185.50	185.53	0.01
20.00	5.797	14.696	14.661	-0.24	183.60	183.46	-0.07
20.00	1.495	50.000	50.117	0.23	177.20	177.20	0.01
60.00	95.740	1.000	1.000	0.02	200.30	200.49	0.09
60.00	6.337	14.696	14.677	-0.13	199.20	198.79	-0.21
60.00	1.701	50.000	50.050	0.10	194.20	193.89	-0.16
100.00	103.100	1.000	1.001	0.07	216.60	216.53	-0.03
100.00	6.869	14.696	14.686	-0.07	215.50	215.10	-0.18
100.00	1.889	50.000	50.024	0.05	211.50	211.13	-0.17
100.00	0.837	100.000	100.132	0.13	204.70	204.40	-0.14
140.00	110.500	1.000	1.001	0.07	233.90	233.61	-0.12
140.00	7.396	14.696	14.689	-0.05	232.80	232.41	-0.17
140.00	2.066	50.000	50.020	0.04	229.40	229.11	-0.13
140.00	0.948	100.000	100.109	0.11	224.10	223.81	-0.13
140.00	0.564	150.000	150.170	0.11	217.60	217.35	-0.12
180.00	117.800	1.000	1.002	0.16	251.90	251.71	-0.07
180.00	7.919	14.696	14.689	-0.05	250.90	250.68	-0.09
180.00	2.237	50.000	50.000	0.00	248.10	247.90	-0.08
180.00	1.048	100.000	100.133	0.13	243.70	243.56	-0.06
180.00	0.647	150.000	150.177	0.12	238.70	238.62	-0.03
180.00	0.439	200.000	200.190	0.10	232.80	232.69	-0.05
180.00	0.393	250.000	249.798	-0.08	225.00	224.76	-0.11

Table 6 (Continued)

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
220.00	125.300	1.000	1.001	0.07	270.90	270.80	-0.04
220.00	8.438	14.696	14.690	-0.04	269.90	269.91	0.00
220.00	2.402	50.000	50.007	0.01	267.60	267.52	-0.03
220.00	1.143	100.000	100.033	0.03	263.80	263.90	0.04
220.00	0.719	150.000	150.158	0.11	259.80	259.90	0.04
220.00	0.504	200.000	200.246	0.12	255.30	255.40	0.04
220.00	0.369	250.000	251.580	0.63	250.10	250.01	-0.04
220.00	0.277	300.000	299.952	-0.02	243.60	243.64	0.02
220.00	0.208	350.000	342.807	-2.06	234.10	235.52	0.60
240.00	129.100	1.000	1.000	-0.01	280.70	280.71	0.00
240.00	8.696	14.696	14.690	-0.04	279.80	279.88	0.03
240.00	2.484	50.000	49.994	-0.01	277.60	277.66	0.02
240.00	1.188	100.000	100.046	0.05	274.10	274.31	0.08
240.00	0.753	150.000	150.138	0.09	270.50	270.67	0.06
240.00	0.534	200.000	200.271	0.14	266.30	266.66	0.13
240.00	0.399	250.000	250.305	0.12	261.80	262.13	0.13
240.00	0.306	300.000	300.245	0.08	256.50	256.82	0.12
240.00	0.235	350.000	349.818	-0.05	249.90	250.17	0.11
240.00	0.170	400.000	398.305	-0.42	238.30	240.06	0.74
260.00	123.800	1.000	1.000	-0.01	290.80	290.85	0.02
260.00	8.953	14.696	14.691	-0.03	290.00	290.07	0.03
260.00	2.564	50.000	50.005	0.01	287.80	288.00	0.07
260.00	1.232	100.000	100.065	0.07	284.60	284.90	0.11
260.00	0.786	150.000	150.094	0.06	281.10	281.57	0.17
260.00	0.562	200.000	200.159	0.08	277.40	277.95	0.20
260.00	0.425	250.000	250.210	0.08	273.30	273.96	0.24

Table 6 (Continued)

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
260.00	0.331	300.000	300.162	0.05	268.70	269.45	0.28
260.00	0.262	350.000	350.000	-0.00	263.30	264.17	0.33
260.00	0.206	400.000	399.385	-0.15	256.80	257.62	0.32
260.00	0.185	420.000	419.315	-0.16	253.90	254.28	0.15
260.00	0.164	440.000	438.757	-0.28	249.60	250.29	0.28
260.00	0.142	460.000	457.770	-0.48	244.50	244.92	0.17
260.00	0.115	480.000	472.690	-1.52	237.30	236.29	-0.43
280.00	136.500	1.000	1.000	-0.01	301.20	301.23	0.01
280.00	9.209	14.696	14.693	-0.02	300.40	300.50	0.03
280.00	2.645	50.000	49.986	-0.03	298.40	298.56	0.06
280.00	1.276	100.000	100.029	0.03	295.30	295.68	0.13
280.00	0.819	150.000	150.045	0.03	292.10	292.62	0.18
280.00	0.588	200.000	200.048	0.02	288.60	289.32	0.25
280.00	0.449	250.000	250.091	0.04	284.90	285.75	0.30
280.00	0.354	300.000	299.958	-0.01	289.90	281.82	0.33
280.00	0.285	350.000	349.855	-0.04	276.30	277.39	0.39
280.00	0.231	400.000	399.730	-0.07	271.10	272.25	0.42
280.00	0.212	420.000	419.999	-0.00	268.70	269.86	0.43
280.00	0.194	440.000	439.831	-0.04	266.10	267.29	0.45
280.00	0.177	460.000	459.725	-0.06	263.20	264.40	0.46
280.00	0.160	480.000	479.594	-0.08	259.90	261.08	0.46
280.00	0.144	500.000	499.039	-0.19	256.10	257.19	0.42
280.00	0.127	520.000	518.045	-0.38	251.30	252.28	0.39
280.00	0.107	540.000	536.400	-0.67	244.20	245.09	0.37
280.00	0.075	560.000	553.444	-1.17	228.30	228.79	0.21
280.00	0.057	580.000	570.253	-1.68	214.20	214.32	0.05
280.00	0.053	600.000	589.137	-1.81	209.40	209.50	0.05

Table 6 (Continued)

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
280.00	0.048	640.000	631.028	-1.40	204.80	204.71	-0.04
280.00	0.046	680.000	676.788	-0.47	202.50	201.83	-0.33
280.00	0.046	700.000	694.988	-0.72	201.70	200.96	-0.36
280.00	0.043	800.000	789.680	-1.29	198.70	197.70	-0.50
280.00	0.042	900.000	884.589	-1.71	196.70	195.54	-0.59
280.00	0.041	1,000.000	979.759	-2.02	195.30	193.94	-0.70
280.00	0.039	1,200.000	1,281.724	6.81	191.30	190.75	-0.29
280.00	0.038	1,400.000	1,405.846	0.42	191.00	189.93	-0.56
280.00	0.037	1,600.000	1,654.601	3.41	190.80	188.76	-1.07
280.00	0.037	1,800.000	1,762.981	-2.06	190.50	188.40	-1.10
280.00	0.036	2,000.000	1,936.128	-3.19	190.40	187.98	-1.27
280.00	0.035	2,500.000	2,452.152	-1.91	190.00	187.49	-1.32
280.00	0.034	3,000.000	2,989.599	-0.35	190.20	187.77	-1.28
280.00	0.033	3,500.000	3,566.762	1.91	190.70	188.65	-1.08
320.00	143.900	1.000	1.000	-0.01	322.70	322.67	-0.01
320.00	9.724	14.696	14.690	-0.04	322.00	322.02	0.01
320.00	2.804	50.000	49.975	-0.05	320.20	320.32	0.04
320.00	1.362	100.000	99.970	-0.03	317.70	317.81	0.03
320.00	0.881	150.000	149.952	-0.03	315.00	315.17	0.05
320.00	0.639	200.000	199.917	-0.04	312.20	312.38	0.06
320.00	0.493	250.000	249.879	-0.05	309.30	309.43	0.04
320.00	0.395	300.000	299.833	-0.06	306.10	306.27	0.06
320.00	0.325	350.000	349.608	-0.11	302.70	302.89	0.06
320.00	0.271	400.000	399.435	-0.14	299.10	299.19	0.03
320.00	0.193	500.000	498.742	-0.25	290.50	290.57	0.02
320.00	0.136	600.000	597.677	-0.39	279.30	279.17	-0.05
320.00	0.091	700.000	698.256	-0.25	262.70	262.43	-0.10

Table 6 (Continued)

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
320.00	0.065	800.000	797.061	-0.37	247.20	246.40	-0.32
320.00	0.055	900.000	897.522	-0.28	238.10	236.99	-0.47
320.00	0.050	1,000.000	999.437	-0.06	232.90	231.69	-0.52
320.00	0.045	1,200.000	1,195.972	-0.34	227.30	226.12	-0.52
320.00	0.043	1,400.000	1,396.233	-0.27	224.20	222.92	-0.57
320.00	0.041	1,600.000	1,599.795	-0.01	222.20	220.80	-0.63
320.00	0.040	1,800.000	1,799.342	-0.04	220.90	219.36	-0.70
320.00	0.039	2,000.000	1,995.863	-0.21	219.90	218.33	-0.71
320.00	0.038	2,500.000	2,488.882	-0.44	218.70	216.83	-0.85
320.00	0.036	3,000.000	2,995.689	-0.14	218.30	216.27	-0.93
320.00	0.035	3,500.000	3,511.837	0.34	218.20	216.32	-0.86
400.00	158.600	1.000	1.000	0.04	368.30	368.21	-0.03
400.00	10.740	14.696	14.697	0.01	367.80	367.69	-0.03
400.00	3.115	50.000	49.991	-0.02	366.50	366.33	-0.05
400.00	1.527	100.000	99.972	-0.03	364.50	364.35	-0.04
400.00	0.997	150.000	150.008	0.01	362.50	362.30	-0.05
400.00	0.732	200.000	199.996	-0.00	360.50	360.19	-0.08
400.00	0.572	250.000	250.083	0.03	358.30	358.01	-0.08
400.00	0.466	300.000	300.128	0.04	356.10	355.74	-0.10
400.00	0.389	350.000	350.123	0.04	353.80	353.39	-0.12
400.00	0.332	400.000	400.174	0.04	351.40	350.94	-0.13
400.00	0.251	500.000	500.295	0.06	346.20	345.72	-0.14
400.00	0.197	600.000	600.194	0.03	340.60	340.04	-0.17
400.00	0.158	700.000	700.204	0.03	334.50	333.83	-0.20
400.00	0.129	800.000	800.135	0.02	327.90	327.13	-0.23
400.00	0.107	900.000	899.760	-0.03	320.90	320.17	-0.23
400.00	0.091	1,000.000	998.420	-0.16	314.00	313.43	-0.18
400.00	0.071	1,200.000	1,196.562	-0.29	303.20	310.98	-0.40

Table 6 (Continued)

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
400.00	0.060	1,400.000	1,404.932	0.35	294.10	293.53	-0.20
400.00	0.053	1,600.000	1,618.458	1.15	288.60	287.69	-0.32
400.00	0.050	1,800.000	1,805.376	0.30	284.60	284.13	-0.17
400.00	0.047	2,000.000	2,004.644	0.23	281.80	281.38	-0.15
400.00	0.043	2,500.000	2,500.424	0.02	277.50	277.29	-0.08
400.00	0.040	3,000.000	3,000.752	0.03	275.40	275.29	-0.40
400.00	0.039	3,500.000	3,502.994	0.09	274.40	274.40	0.00
600.00	195.600	1.000	1.000	0.01	496.90	496.32	-0.12
600.00	13.280	14.696	14.695	-0.01	496.50	495.99	-0.10
600.00	3.880	50.000	49.981	-0.04	495.60	495.12	-0.10
600.00	1.923	100.000	99.952	-0.05	494.40	493.87	-0.11
600.00	1.271	150.000	149.885	-0.08	493.10	492.61	-0.10
600.00	0.945	200.000	199.905	-0.05	491.90	491.34	-0.11
600.00	0.745	250.000	249.912	-0.04	490.60	490.05	-0.11
600.00	0.618	300.000	299.928	-0.02	489.30	488.75	-0.11
600.00	0.525	350.000	349.904	-0.03	488.00	487.44	-0.11
600.00	0.456	400.000	399.965	-0.01	486.70	486.12	-0.12
600.00	0.358	500.000	500.068	0.01	484.00	483.44	-0.12
600.00	0.293	600.000	600.425	0.07	481.30	480.72	-0.12
600.00	0.247	700.000	700.804	0.11	478.60	477.97	-0.13
600.00	0.213	800.000	801.107	0.14	475.90	475.21	-0.14
600.00	0.187	900.000	899.971	-0.00	473.10	472.49	-0.13
600.00	0.166	1,000.000	998.270	-0.17	470.30	469.80	-0.11
600.00	0.136	1,200.000	1,195.681	-0.36	464.80	464.51	-0.06
600.00	0.114	1,400.000	1,401.517	0.11	459.70	459.26	-0.10
600.00	0.098	1,600.000	1,606.845	0.43	454.90	454.42	-0.10
600.00	0.088	1,800.000	1,796.416	-0.20	450.50	450.38	-0.03
600.00	0.079	2,000.000	2,006.873	0.34	447.10	446.40	-0.16

Table 6 (Continued)

T, °F	v, ft ³ /lb	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	h _{exp} , Btu/lb	h _{cal} , Btu/lb	(Δh/h) X 100
600.00	0.065	2,500.000	2,512.595	0.51	439.10	438.83	-0.06
600.00	0.058	3,000.000	2,995.595	-0.15	433.70	433.71	0.00
600.00	0.053	3,500.000	3,478.769	-0.61	430.00	430.02	0.01
900.00	251.000	1.000	1.000	0.01	721.80	721.41	-0.05
900.00	17.080	14.696	14.686	-0.07	721.60	721.20	-0.06
900.00	5.009	50.000	49.978	-0.04	721.00	720.66	-0.05
900.00	2.499	100.000	99.945	-0.05	720.30	719.90	-0.06
900.00	1.661	150.000	149.919	-0.05	719.60	719.13	-0.06
900.00	1.243	200.000	199.837	-0.08	718.80	718.37	-0.06
900.00	0.992	250.000	249.882	-0.05	718.10	717.62	-0.07
900.00	0.825	300.000	299.877	-0.04	717.40	716.86	-0.08
900.00	0.705	350.000	349.858	-0.04	716.70	716.11	-0.08
900.00	0.616	400.000	399.841	-0.04	715.90	715.35	-0.08
900.00	0.491	500.000	499.839	-0.03	714.50	713.86	-0.09
900.00	0.408	600.000	599.824	-0.03	713.10	712.39	-0.10
900.00	0.349	700.000	699.674	-0.05	711.60	710.94	-0.09
900.00	0.304	800.000	799.848	-0.02	710.20	709.50	-0.10
900.00	0.270	900.000	900.048	0.01	708.90	708.09	-0.11
900.00	0.243	1,000.000	1,000.263	0.03	707.50	706.70	-0.11
900.00	0.202	1,200.000	1,200.067	0.01	704.90	704.02	-0.13
900.00	0.174	1,400.000	1,400.008	0.00	702.40	701.46	-0.13
900.00	0.152	1,600.000	1,600.411	0.03	700.00	699.03	-0.14
900.00	0.136	1,800.000	1,801.689	0.09	697.70	696.73	-0.14
900.00	0.123	2,000.000	2,000.834	0.04	695.60	694.60	-0.14
900.00	0.101	2,500.000	2,498.969	-0.04	690.90	689.97	-0.15
900.00	0.087	3,000.000	2,994.495	-0.18	687.00	685.99	-0.15
900.00	0.077	3,500.000	3,487.930	-0.34	683.80	682.85	-0.14

The relatively large discrepancies exhibited near the critical region are due partly to the condition that, in the least-squares algorithm, the analytical model is forced to reproduce the critical point exactly [$P_r = 1$ and $(\partial P_r / \partial v_r) = (\partial^2 P_r / \partial v_r^2) \equiv 0$ at $T_r = v_r = 1$]. By relaxing these constraints, the errors would be reduced but the self-consistent nature of the representation would be lost.

3.2 Vapor Pressure and Saturated Liquid Volume

The vapor pressure and saturated liquid volume (ρ_ℓ^{-1}) correlations are compared with the data in Tables 7 and 8 for temperatures up to the critical value. For ammonia, the errors in both vapor pressure and specific volume are negligible. In the case of isobutane, the magnitude of the error is on the order of a tenth of a percent which is satisfactory for most applications.

Table 7. Results of the vapor pressure and saturated liquid volume representation for ammonia: Comparison with data of Davies⁵

T, K	P _{exp} , atm	P _{cal} , atm	(ΔP/P) X 100	v _{exp} , cm ³ /mol	v _{cal} , cm ³ /mol	(Δv/v) X 100
200	0.08553	0.08557	0.05	23.37	23.36	-0.04
210	0.1756	0.1757	0.06	23.74	23.74	0.00
220	0.3347	0.3349	0.06	24.13	24.13	0.00
230	0.5982	0.5986	0.07	24.55	24.55	0.00
240	1.0124	1.0126	0.02	24.99	24.99	0.00
250	1.632	1.633	0.06	25.46	25.46	0.00
260	2.526	2.526	0.00	25.96	25.96	0.00
270	3.769	3.769	0.00	26.50	26.50	0.00
280	5.446	5.446	0.00	27.07	27.08	0.04
290	7.652	7.651	-0.01	27.70	27.70	0.00
300	10.485	10.488	0.03	28.39	28.39	0.00
310	14.063	14.064	0.01	29.14	29.14	0.00
320	18.49	18.49	0.00	29.98	29.98	0.00
330	23.90	23.91	0.04	30.92	30.92	0.00
340	30.42	30.43	0.03	31.99	31.99	0.00
350	38.19	38.20	0.03	33.24	33.25	0.03
360	47.40	47.37	-0.06	34.73	34.74	0.03
370	58.14	58.09	-0.09	36.58	36.60	0.05
380	70.60	70.54	-0.08	39.03	39.05	0.05
390	84.94	84.90	-0.05	42.61	42.63	0.05
400	101.5	101.4	-0.10	49.45	49.50	0.10
405.44	111.3	111.3	0	72.33	72.33	0

Table 8. Results of the vapor pressure and saturated liquid volume representation for isobutane: Comparison with the data of Canjar and Manning⁸

T, °F	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	v _{exp} , ft ³ /lb	v _{cal} , ft ³ /lb	(Δv/v) X 100
0.0	11.530	11.552	0.19	0.02668	0.02667	-0.05
10.00	14.414	14.420	0.04	0.02695	0.02695	0.00
10.89	14.696	14.700	0.03	0.02699	0.02698	-0.05
20.00	17.823	17.816	-0.04	0.02723	0.02724	0.05
30.00	21.829	21.803	-0.12	0.02753	0.02754	0.05
40.00	26.482	26.447	-0.13	0.02783	0.02786	0.09
50.00	31.861	31.816	-0.14	0.02815	0.02818	0.10
60.00	38.036	37.979	-0.15	0.02848	0.02851	0.12
70.00	45.059	45.011	-0.11	0.02882	0.02886	0.14
80.00	52.975	52.987	0.02	0.02918	0.02922	0.15
90.00	61.953	61.984	0.05	0.02956	0.02960	0.14
100.00	72.037	72.082	0.06	0.02996	0.03000	0.13
110.00	83.218	83.365	0.18	0.03039	0.03042	0.09
120.00	95.733	95.917	0.19	0.03084	0.03086	0.07
130.00	109.72	109.83	0.10	0.03131	0.03133	0.07
140.00	125.18	125.18	0.00	0.03182	0.03183	0.04
150.00	141.98	142.08	0.07	0.03237	0.03237	0.00
160.00	160.55	160.62	0.04	0.03295	0.03295	0.01
170.00	180.89	180.90	0.01	0.03358	0.03359	0.02
180.00	203.04	203.03	-0.00	0.03428	0.03428	0.01

Table 8 (Continued)

T, °F	P _{exp} , psia	P _{cal} , psia	(ΔP/P) X 100	v _{exp} , ft ³ /lb	v _{cal} , ft ³ /lb	(Δv/v) X 100
190.00	227.20	227.12	-0.04	0.03507	0.03506	-0.04
200.00	253.41	253.28	-0.05	0.03593	0.03593	-0.00
210.00	281.85	281.64	-0.07	0.03691	0.03693	0.05
220.00	312.60	312.33	-0.09	0.03810	0.03810	-0.01
230.00	345.82	345.48	-0.10	0.03950	0.03950	0.01
240.00	381.57	381.24	-0.09	0.04120	0.04127	0.16
250.00	420.11	419.76	-0.08	0.04360	0.04362	0.03
260.00	461.44	461.21	-0.05	0.04700	0.04711	0.23
270.00	505.85	505.76	-0.02	0.05400	0.05399	-0.02
274.96	529.06	529.06	0.0	0.07244	0.07244	0.0

4. THERMODYNAMIC PROPERTIES TABLES

Tables 9 through 12 present values of the thermodynamic variables for the saturated liquid and vapor and superheated vapor states. The saturated liquid at -40°C serves as the reference state for enthalpy and entropy. The following units are used consistently throughout:

Pressure, P	kPa
Temperature, T	$^{\circ}\text{C}$
Specific volume, v	cm^3/g
Specific enthalpy, h	kJ/kg
Specific entropy, s	$\text{kJ}/\text{kg}\cdot\text{K}$

The following conversion factors may be used to convert to English units:

<u>To convert from</u>	<u>To</u>	<u>Multiply by</u>
kPa	psia	0.1450
cm^3/g	ft^3/lb_m	0.01602
kJ/kg	Btu/lb_m	0.4302
$\text{kJ}/\text{kg}\cdot\text{K}$	$\text{Btu}/\text{lb}_m\cdot^{\circ}\text{F}$	0.2390

Temperature conversion: $T(^{\circ}\text{F}) = 1.8 \times T(^{\circ}\text{C}) + 32$

Table 9. The saturation properties of ammonia

T	P	v_f	v_{fg}	v_g	h_f	h_{fg}	h_g	s_f	s_{fg}	s_g
-20	190.6	1.504	621.7	623.3	89.78	1331	1420	0.3686	5.256	5.624
-18	208.2	1.510	572.5	574.0	98.72	1324	1423	0.4038	5.191	5.624
-16	226.9	1.516	527.9	529.4	107.6	1318	1426	0.4382	5.126	5.565
-14	247.0	1.522	487.3	488.8	116.8	1312	1429	0.4739	5.062	5.535
-12	268.5	1.528	450.4	452.0	125.9	1305	1431	0.5088	4.998	5.507
-10	291.4	1.534	416.8	418.3	135.4	1298	1434	0.5449	4.933	5.478
- 8	315.8	1.540	386.3	387.8	144.4	1292	1436	0.5786	4.872	5.451
- 6	341.9	1.546	358.4	360.0	153.2	1285	1439	0.6117	4.812	5.424
- 4	369.6	1.553	332.8	334.3	162.9	1278	1441	0.6476	4.749	5.396
- 2	399.0	1.559	309.3	310.9	172.4	1271	1443	0.6828	4.687	5.370
0	430.2	1.566	288.0	289.5	181.4	1264	1446	0.7157	4.628	5.344
2	463.3	1.573	268.4	270.0	190.3	1257	1448	0.7480	4.570	5.318
4	498.3	1.580	250.2	251.8	200.0	1250	1450	0.7829	4.510	5.292
6	535.4	1.587	233.5	235.1	209.6	1242	1452	0.8172	4.450	5.267
8	574.6	1.594	218.2	219.8	219.1	1235	1454	0.8509	4.391	5.242
10	615.9	1.601	204.0	205.6	228.5	1227	1456	0.8840	4.334	5.218
12	659.6	1.608	191.0	192.6	237.8	1220	1458	0.9164	4.277	5.194
14	705.5	1.616	179.0	180.6	247.0	1212	1459	0.9483	4.222	5.170
16	753.9	1.623	167.7	169.3	257.0	1204	1461	0.9826	4.164	5.146
18	804.9	1.631	157.4	159.1	265.9	1197	1462	1.013	4.110	5.123
20	858.4	1.639	147.8	149.4	275.7	1188	1464	1.046	4.053	5.100
22	914.6	1.647	138.9	140.5	285.4	1180	1465	1.079	3.998	5.077
24	973.6	1.655	130.6	132.2	294.9	1172	1467	1.111	3.943	5.054
26	1035	1.663	122.8	124.5	304.8	1163	1468	1.144	3.888	5.032
28	1100	1.672	115.6	117.3	314.6	1154	1469	1.176	3.833	5.009
30	1168	1.680	108.9	110.6	324.2	1146	1470	1.207	3.780	4.987

Table 9 (Continued)

T	P	v_f	v_{fg}	v_g	h_f	h_{fg}	h_g	s_f	s_{fg}	s_g
32	1239	1.689	102.7	104.4	333.7	1137	1471	1.238	3.727	4.965
34	1313	1.698	96.82	98.52	343.6	1128	1472	1.270	3.673	4.943
36	1391	1.707	91.36	93.07	353.4	1119	1473	1.301	3.620	4.921
38	1472	1.716	86.23	87.94	363.5	1110	1473	1.333	3.566	4.900
40	1557	1.726	81.43	83.16	373.4	1100	1474	1.365	3.513	4.878
42	1645	1.736	76.95	78.68	383.3	1091	1474	1.396	3.461	4.857
44	1737	1.745	72.75	74.50	393.0	1081	1474	1.426	3.409	4.835
46	1832	1.756	68.79	70.55	403.1	1071	1474	1.457	3.357	4.814
48	1932	1.766	65.06	66.82	413.5	1061	1474	1.489	3.304	4.793
50	2036	1.777	61.55	63.33	423.7	1051	1474	1.520	3.251	4.771
52	2143	1.788	58.29	60.08	433.4	1041	1474	1.550	3.201	4.750
54	2255	1.799	55.17	56.97	443.9	1030	1474	1.581	3.148	4.729
56	2372	1.810	52.25	54.06	454.2	1019	1473	1.612	3.096	4.708
58	2492	1.822	49.50	51.32	464.5	1008	1473	1.642	3.044	4.686
60	2618	1.834	46.88	48.72	475.0	996.7	1472	1.673	2.992	4.665
62	2748	1.847	44.43	46.27	485.4	985.3	1471	1.704	2.940	4.644
64	2883	1.860	42.09	43.95	496.1	973.4	1470	1.735	2.887	4.622
66	3022	1.873	39.89	41.76	506.7	961.5	1468	1.765	2.835	4.600
68	3167	1.886	37.81	39.70	517.2	949.5	1467	1.795	2.783	4.579
70	3317	1.900	35.85	37.75	527.6	937.5	1465	1.825	2.732	4.557
72	3472	1.915	33.97	35.88	538.7	924.5	1463	1.856	2.679	4.535
74	3632	1.930	32.19	34.12	549.6	911.5	1461	1.887	2.626	4.513
76	3798	1.945	30.50	32.45	560.5	898.4	1459	1.917	2.573	4.490
78	3970	1.961	28.91	30.87	571.2	885.2	1456	1.947	2.521	4.468
80	4147	1.978	27.37	29.35	582.6	871.0	1454	1.978	2.466	4.445
82	4330	1.995	25.92	27.91	594.0	856.7	1451	2.009	2.412	4.422
84	4519	2.013	24.54	26.55	605.2	842.3	1447	2.040	2.358	4.398
86	4715	2.032	23.21	25.24	617.0	826.9	1444	2.072	2.302	4.374
88	4916	2.051	21.94	22.99	628.8	811.3	1440	2.103	2.246	4.350
90	5124	2.072	20.74	22.82	640.5	795.6	1436	2.134	2.191	4.325

Table 9 (Continued)

T	P	v_f	v_{fg}	v_g	h_f	h_{fg}	h_g	s_f	s_{fg}	s_g
92	5338	2.093	19.61	21.70	652.0	779.8	1432	2.165	2.136	4.301
94	5559	2.115	18.50	20.62	664.3	762.8	1427	2.197	2.078	4.275
96	5787	2.139	17.45	19.59	676.4	745.7	1422	2.229	2.020	4.249
98	6022	2.163	16.43	18.59	689.2	727.4	1417	2.262	1.960	4.222
100	6264	2.190	15.46	17.65	701.8	708.9	1411	2.295	1.900	4.194
102	6513	2.217	14.52	16.73	715.1	689.2	1404	2.329	1.837	4.166
104	6769	2.247	13.62	15.86	728.3	669.2	1398	2.362	1.774	4.137
106	7033	2.279	12.74	15.02	742.1	648.0	1390	2.397	1.709	4.106
108	7304	2.312	11.90	14.22	755.9	626.4	1382	2.432	1.643	4.075
110	7584	2.349	11.09	13.43	770.3	603.4	1374	2.468	1.575	4.043
112	7871	2.389	10.29	12.68	785.2	579.1	1364	2.505	1.504	4.008
114	8167	2.433	9.505	11.94	800.7	553.2	1354	2.543	1.429	3.972
116	8471	2.481	8.756	11.24	816.3	526.8	1343	2.582	1.354	3.935
118	8783	2.535	8.005	10.54	833.1	497.6	1331	2.623	1.272	3.895
120	9104	2.596	7.249	9.845	851.0	465.6	1317	2.666	1.184	3.850
122	9434	2.666	6.489	9.156	870.0	430.6	1301	2.712	1.090	3.802
124	9772	2.750	5.692	8.443	891.1	390.1	1281	2.763	0.9821	3.745
126	10120	2.854	4.884	7.737	913.6	345.5	1259	2.817	0.8657	3.683
128	10480	2.989	3.968	6.958	939.9	289.9	1230	2.880	0.7226	3.603
130	10850	3.192	2.812	6.003	972.7	212.0	1185	2.959	0.5258	3.485
132	11220	3.680	1.003	4.683	1024	78.02	1102	3.083	0.1926	3.276
132.3	11280	4.247	0.0	4.247	1068	0.0	1068	3.190	0.0	3.190

Table 10. Thermodynamic properties of ammonia in the superheated vapor state
Temperature range: -50 to 0°C

P	T	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
5	V	21750.	22240.	22730.	23220.	23710.	24200.	24690.	25180.	25670.	26160.	26650.
	H	1378.	1388.	1398.	1408.	1418.	1429.	1439.	1449.	1459.	1469.	1480.
	S	7.202	7.246	7.290	7.333	7.375	7.416	7.457	7.497	7.536	7.575	7.613
10	V	10860.	11100.	11350.	11600.	11840.	12090.	12330.	12580.	12820.	13070.	13310.
	H	1377.	1387.	1398.	1408.	1418.	1428.	1438.	1449.	1459.	1469.	1479.
	S	6.861	6.906	6.950	6.993	7.035	7.076	7.117	7.157	7.196	7.235	7.273
50	V		2190.	2250.	2300.	2350.	2400.	2450.	2500.	2550.	2600.	2650.
	H		1382.	1393.	1403.	1414.	1424.	1434.	1445.	1455.	1466.	1476.
	S		6.102	6.148	6.192	6.236	6.278	6.320	6.361	6.401	6.441	6.479
100	V					1160.	1190.	1210.	1240.	1260.	1290.	1310.
	H					1408.	1419.	1430.	1440.	1451.	1462.	1473.
	S					5.880	5.924	5.967	6.009	6.051	6.091	6.131
101.33	V					1140.	1170.	1200.	1220.	1250.	1270.	1300.
	H					1408.	1419.	1429.	1440.	1451.	1462.	1472.
	S					5.873	5.917	5.960	6.002	6.044	6.084	6.124
200	V								606.7	620.3	633.7	647.1
	H								1431.	1442.	1453.	1465.
	S								5.643	5.687	5.729	5.771
300	V										415.2	424.5
	H										1445.	1457.
	S										5.507	5.550
400	V											313.0
	H											1448.
	S											5.387
500	V											
	H											
	S											
600	V											
	H											
	S											
700	V											
	H											
	S											
800	V											
	H											
	S											
900	V											
	H											
	S											

Table 10 (Continued)
Temperature range: 5 to 55°C

P	T	5	10	15	20	25	30	35	40	45	50	55
5	V	27140.	27630.	28120.	28600.	29090.	29580.	30070.	30560.	31050.	31540.	32030.
	H	1490.	1500.	1511.	1521.	1532.	1542.	1553.	1563.	1574.	1585.	1595.
	S	7.650	7.687	7.723	7.759	7.795	7.829	7.864	7.898	7.932	7.965	7.998
10	V	13560.	13800.	14050.	14290.	14540.	14780.	15030.	15270.	15520.	15760.	16010.
	H	1490.	1500.	1510.	1521.	1531.	1542.	1552.	1563.	1574.	1584.	1595.
	S	7.311	7.348	7.384	7.420	7.456	7.491	7.525	7.559	7.593	7.626	7.659
50	V	2700.	2750.	2800.	2850.	2900.	2950.	2990.	3040.	3090.	3140.	3190.
	H	1487.	1497.	1508.	1519.	1529.	1540.	1550.	1561.	1572.	1583.	1593.
	S	6.518	6.555	6.592	6.628	6.664	6.700	6.735	6.769	6.803	6.836	6.870
100	V	1340.	1360.	1390.	1420.	1440.	1470.	1490.	1520.	1540.	1570.	1590.
	H	1483.	1494.	1505.	1516.	1526.	1537.	1548.	1559.	1570.	1580.	1591.
	S	6.170	6.208	6.245	6.282	6.319	6.355	6.390	6.425	6.459	6.493	6.526
101.33	V	1320.	1350.	1370.	1400.	1420.	1450.	1470.	1500.	1520.	1540.	1570.
	H	1483.	1494.	1505.	1515.	1526.	1537.	1548.	1559.	1569.	1580.	1591.
	S	6.163	6.201	6.239	6.276	6.312	6.348	6.383	6.418	6.453	6.486	6.520
200	V	660.3	673.5	686.6	699.6	712.6	725.5	738.4	751.2	764.0	776.7	789.4
	H	1476.	1487.	1498.	1509.	1520.	1532.	1543.	1554.	1565.	1576.	1587.
	S	5.811	5.851	5.890	5.928	5.966	6.003	6.039	6.075	6.110	6.144	6.179
300	V	433.7	442.9	452.0	460.9	469.9	478.7	487.6	496.3	505.0	513.7	522.4
	H	1468.	1480.	1492.	1503.	1514.	1526.	1537.	1549.	1560.	1571.	1583.
	S	5.593	5.634	5.675	5.714	5.753	5.791	5.828	5.865	5.901	5.936	5.971
400	V	320.3	327.4	334.5	341.5	348.4	355.3	362.1	368.8	375.5	382.2	388.8
	H	1460.	1473.	1485.	1496.	1508.	1520.	1532.	1543.	1555.	1567.	1578.
	S	5.431	5.474	5.516	5.557	5.597	5.636	5.675	5.712	5.749	5.785	5.820
500	V	252.1	258.1	263.9	269.7	275.5	281.1	286.7	292.3	297.8	303.2	308.6
	H	1452.	1465.	1477.	1490.	1502.	1514.	1526.	1538.	1550.	1562.	1574.
	S	5.300	5.345	5.389	5.431	5.472	5.513	5.552	5.591	5.628	5.665	5.701
600	V		211.7	216.8	221.8	226.8	231.6	236.4	241.2	245.9	250.5	255.2
	H		1457.	1470.	1483.	1496.	1508.	1520.	1533.	1545.	1557.	1569.
	S		5.234	5.280	5.324	5.367	5.409	5.449	5.489	5.527	5.565	5.602
700	V			183.0	187.5	191.9	196.2	200.5	204.7	208.8	212.9	216.9
	H			1462.	1476.	1489.	1502.	1515.	1527.	1540.	1552.	1564.
	S			5.184	5.230	5.275	5.318	5.360	5.400	5.440	5.478	5.516
800	V				161.7	165.7	169.6	173.5	177.2	181.0	184.6	188.2
	H				1468.	1482.	1495.	1509.	1522.	1534.	1547.	1560.
	S				5.146	5.192	5.236	5.280	5.321	5.362	5.401	5.440
900	V					145.3	148.9	152.4	155.9	159.3	162.6	165.9
	H					1475.	1489.	1502.	1516.	1529.	1542.	1555.
	S					5.116	5.162	5.207	5.250	5.291	5.332	5.371

Table 10 (Continued)
Temperature range: 5 to 55°C

P	T	5	10	15	20	25	30	35	40	45	50	55
1000	V					128.9	132.3	135.5	138.7	141.9	145.0	148.0
	H					1468.	1482.	1496.	1510.	1523.	1537.	1550.
	S					5.046	5.094	5.140	5.184	5.227	5.268	5.309
1200	V							110.1	113.0	115.7	118.5	121.1
	H							1483.	1497.	1512.	1526.	1540.
	S							5.017	5.065	5.110	5.154	5.196
1400	V								94.43	96.97	99.44	101.8
	H								1484.	1500.	1515.	1529.
	S								4.957	5.005	5.052	5.096
1600	V									82.80	85.10	87.37
	H									1487.	1503.	1518.
	S									4.909	4.958	5.005
1800	V										73.85	75.96
	H										1490.	1506.
	S										4.870	4.920
2000	V										64.77	66.79
	H										1477.	1494.
	S										4.786	4.839
2200	V											59.22
	H											1481.
	S											4.761
2400	V											
	H											
	S											
2600	V											
	H											
	S											
2800	V											
	H											
	S											
3000	V											
	H											
	S											
3200	V											
	H											
	S											
3400	V											
	H											
	S											

Table 10 (Continued)
Temperature range: 60 to 110°C

P	T	60	65	70	75	80	85	90	95	100	105	110
5	V	325.10.	33000.	33490.	33980.	34470.	34960.	35450.	35930.	36420.	36910.	37400.
	H	1606.	1617.	1628.	1638.	1649.	1660.	1671.	1682.	1694.	1705.	1716.
	S	8.030	8.062	8.094	8.126	8.157	8.187	8.218	8.248	8.278	8.308	8.337
10	V	16250.	16500.	16740.	16980.	17230.	17470.	17720.	17960.	18210.	18450.	18700.
	H	1606.	1617.	1627.	1638.	1649.	1660.	1671.	1682.	1693.	1705.	1716.
	S	7.691	7.724	7.755	7.787	7.818	7.849	7.879	7.910	7.940	7.969	7.999
50	V	3240.	3290.	3340.	3390.	3440.	3490.	3540.	3590.	3630.	3680.	3730.
	H	1604.	1615.	1626.	1637.	1648.	1659.	1670.	1681.	1692.	1703.	1715.
	S	6.902	6.935	6.967	6.998	7.030	7.061	7.091	7.122	7.152	7.181	7.211
100	V	1620.	1640.	1660.	1690.	1710.	1740.	1760.	1790.	1810.	1840.	1860.
	H	1602.	1613.	1624.	1635.	1646.	1657.	1668.	1680.	1691.	1702.	1713.
	S	6.560	6.592	6.624	6.656	6.688	6.719	6.750	6.780	6.810	6.840	6.870
101.33	V	1590.	1620.	1640.	1670.	1690.	1720.	1740.	1770.	1790.	1810.	1840.
	H	1602.	1613.	1624.	1635.	1646.	1657.	1668.	1679.	1691.	1702.	1713.
	S	6.553	6.586	6.618	6.650	6.681	6.712	6.743	6.774	6.804	6.834	6.863
200	V	802.1	814.7	827.4	840.0	852.5	865.1	877.6	890.1	902.6	915.1	927.6
	H	1598.	1609.	1620.	1632.	1643.	1654.	1665.	1676.	1688.	1699.	1710.
	S	6.212	6.245	6.278	6.310	6.342	6.374	6.405	6.436	6.466	6.497	6.526
300	V	531.0	539.6	548.1	556.7	565.2	573.7	582.1	590.6	599.0	607.4	615.8
	H	1594.	1605.	1617.	1628.	1639.	1651.	1662.	1673.	1685.	1696.	1708.
	S	6.005	6.039	6.072	6.105	6.137	6.169	6.201	6.232	6.263	6.293	6.323
400	V	395.4	402.0	408.5	415.0	421.5	427.9	434.4	440.8	447.2	453.6	460.0
	H	1590.	1601.	1613.	1624.	1636.	1647.	1659.	1670.	1682.	1693.	1705.
	S	5.855	5.890	5.923	5.957	5.989	6.022	6.054	6.085	6.116	6.147	6.177
500	V	314.0	319.4	324.7	330.0	335.2	340.5	345.7	350.9	356.1	361.3	366.4
	H	1585.	1597.	1609.	1620.	1632.	1644.	1655.	1667.	1679.	1690.	1702.
	S	5.737	5.772	5.806	5.840	5.873	5.906	5.938	5.970	6.001	6.033	6.063
600	V	259.7	264.3	268.8	273.3	277.7	282.2	286.6	291.0	295.4	299.7	304.1
	H	1581.	1593.	1605.	1617.	1628.	1640.	1652.	1664.	1676.	1687.	1699.
	S	5.638	5.674	5.709	5.743	5.777	5.810	5.842	5.875	5.906	5.938	5.969
700	V	220.9	224.9	228.8	232.8	236.6	240.5	244.3	248.2	252.0	255.7	259.5
	H	1577.	1589.	1601.	1613.	1625.	1637.	1649.	1661.	1673.	1684.	1696.
	S	5.553	5.589	5.625	5.659	5.694	5.727	5.760	5.793	5.825	5.857	5.888
800	V	191.8	195.4	198.9	202.4	205.8	209.2	212.6	216.0	219.4	222.8	226.1
	H	1572.	1584.	1597.	1609.	1621.	1633.	1645.	1657.	1669.	1681.	1693.
	S	5.478	5.515	5.551	5.586	5.621	5.655	5.688	5.721	5.754	5.786	5.817
900	V	169.2	172.4	175.6	178.7	181.8	184.9	188.0	191.0	194.1	197.1	200.1
	H	1567.	1580.	1593.	1605.	1617.	1630.	1642.	1654.	1666.	1678.	1691.
	S	5.410	5.447	5.484	5.520	5.555	5.590	5.624	5.657	5.690	5.722	5.754

Table 10 (Continued)
Temperature range: 60 to 110°C

P	T	60	65	70	75	80	85	90	95	100	105	110
1000	V	151.0	154.0	156.9	159.8	162.6	165.5	168.3	171.0	173.8	176.6	179.3
	H	1563.	1576.	1588.	1601.	1614.	1626.	1638.	1651.	1663.	1675.	1688.
	S	5.348	5.386	5.424	5.460	5.496	5.531	5.565	5.599	5.632	5.665	5.697
1200	V	123.7	126.3	128.8	131.3	133.8	136.2	138.6	141.0	143.4	145.7	148.1
	H	1553.	1567.	1580.	1593.	1606.	1619.	1631.	1644.	1657.	1669.	1682.
	S	5.237	5.277	5.316	5.354	5.391	5.427	5.462	5.497	5.531	5.564	5.597
1400	V	104.2	106.5	108.8	111.0	113.2	115.3	117.5	119.6	121.6	123.7	125.8
	H	1543.	1557.	1571.	1585.	1598.	1611.	1624.	1637.	1650.	1663.	1676.
	S	5.139	5.181	5.221	5.260	5.298	5.336	5.372	5.408	5.442	5.477	5.510
1600	V	89.49	91.60	93.66	95.68	97.67	99.62	101.5	103.4	105.3	107.2	109.0
	H	1533.	1548.	1562.	1576.	1590.	1603.	1617.	1630.	1643.	1657.	1670.
	S	5.050	5.094	5.136	5.176	5.216	5.254	5.292	5.328	5.364	5.399	5.433
1800	V	77.99	79.96	81.88	83.75	85.59	87.38	89.15	90.89	92.61	94.30	95.97
	H	1522.	1537.	1552.	1567.	1581.	1595.	1609.	1623.	1637.	1650.	1663.
	S	4.968	5.013	5.057	5.099	5.140	5.180	5.219	5.256	5.293	5.328	5.363
2000	V	68.73	70.60	72.41	74.17	75.89	77.57	79.21	80.83	82.42	83.98	85.53
	H	1511.	1527.	1543.	1558.	1573.	1587.	1602.	1616.	1630.	1643.	1657.
	S	4.890	4.938	4.984	5.028	5.070	5.111	5.151	5.190	5.227	5.264	5.300
2200	V	61.10	62.90	64.63	66.30	67.93	69.52	71.06	72.58	74.07	75.53	76.97
	H	1499.	1516.	1532.	1548.	1564.	1579.	1594.	1608.	1623.	1637.	1651.
	S	4.815	4.866	4.914	4.960	5.004	5.047	5.088	5.128	5.166	5.204	5.240
2400	V	54.67	56.43	58.10	59.71	61.27	62.78	64.25	65.69	67.10	68.48	69.83
	H	1486.	1504.	1522.	1538.	1555.	1570.	1586.	1601.	1615.	1630.	1644.
	S	4.743	4.796	4.847	4.895	4.942	4.986	5.028	5.069	5.109	5.147	5.185
2600	V	49.17	50.90	52.53	54.10	55.60	57.06	58.47	59.84	61.18	62.49	63.78
	H	1473.	1492.	1510.	1528.	1545.	1561.	1577.	1593.	1608.	1623.	1637.
	S	4.671	4.729	4.782	4.833	4.881	4.927	4.971	5.014	5.055	5.094	5.133
2800	V		46.10	47.72	49.25	50.72	52.13	53.49	54.81	56.10	57.35	58.58
	H		1479.	1499.	1517.	1535.	1552.	1569.	1585.	1600.	1615.	1630.
	S		4.662	4.719	4.773	4.823	4.871	4.917	4.961	5.003	5.044	5.083
3000	V			43.50	45.01	46.46	47.83	49.16	50.44	51.68	52.89	54.07
	H			1486.	1506.	1525.	1542.	1560.	1576.	1592.	1608.	1624.
	S			4.656	4.713	4.766	4.816	4.864	4.909	4.953	4.995	5.035
3200	V			39.75	41.27	42.69	44.05	45.35	46.60	47.80	48.97	50.11
	H			1473.	1494.	1514.	1532.	1550.	1568.	1584.	1601.	1616.
	S			4.594	4.654	4.710	4.763	4.813	4.860	4.905	4.948	4.990
3400	V				37.92	39.34	40.69	41.96	43.19	44.36	45.50	46.60
	H				1482.	1502.	1522.	1541.	1559.	1576.	1593.	1609.
	S				4.595	4.655	4.710	4.762	4.811	4.858	4.903	4.945

Table 10 (Continued)
Temperature range: 60 to 110°C

P	T	60	65	70	75	80	85	90	95	100	105	110
3600	V				34.89	36.32	37.67	38.93	40.14	41.29	42.40	43.48
	H				1468.	1490.	1511.	1531.	1550.	1568.	1585.	1602.
	S				4.536	4.600	4.658	4.713	4.764	4.812	4.858	4.902
3800	V					33.59	34.93	36.20	37.39	38.53	39.62	40.68
	H					1478.	1500.	1521.	1540.	1559.	1577.	1594.
	S					4.544	4.606	4.663	4.717	4.767	4.815	4.861
4000	V					31.07	32.44	33.71	34.90	36.03	37.11	38.14
	H					1464.	1488.	1510.	1530.	1550.	1568.	1586.
	S					4.487	4.554	4.614	4.671	4.723	4.773	4.820
4200	V						30.15	31.44	32.63	33.75	34.82	35.84
	H						1475.	1498.	1520.	1540.	1560.	1578.
	S						4.501	4.565	4.624	4.679	4.731	4.779
4400	V						28.03	29.34	30.54	31.66	32.72	33.73
	H						1462.	1486.	1509.	1531.	1551.	1570.
	S						4.447	4.516	4.578	4.636	4.689	4.740
4600	V						26.05	27.39	28.61	29.74	30.80	31.80
	H						1447.	1474.	1498.	1520.	1541.	1561.
	S						4.391	4.465	4.531	4.592	4.648	4.700
4800	V							25.57	26.81	27.96	29.02	30.02
	H							1460.	1486.	1510.	1532.	1553.
	S							4.413	4.484	4.548	4.607	4.661
5000	V							23.85	25.13	26.29	27.36	28.36
	H							1446.	1474.	1499.	1522.	1544.
	S							4.360	4.436	4.504	4.566	4.622
5200	V							23.55	24.74	25.82	26.83	
	H							1460.	1487.	1512.	1534.	
	S							4.387	4.459	4.524	4.584	
5400	V							22.04	23.27	24.38	25.39	
	H							1446.	1475.	1501.	1525.	
	S							4.336	4.414	4.482	4.545	
5600	V							20.60	21.88	23.01	24.04	
	H							1431.	1462.	1489.	1514.	
	S							4.282	4.367	4.440	4.505	
5800	V								20.56	21.72	22.77	
	H								1448.	1478.	1504.	
	S								4.318	4.396	4.466	
6000	V								19.28	20.50	21.57	
	H								1433.	1465.	1493.	
	S								4.267	4.352	4.425	

Table 10 (Continued)
Temperature range: 60 to 110°C

P	T	60	65	70	75	80	85	90	95	100	105	110
6200	V H S									18.04 1416. 4.212	19.32 1451. 4.306	20.43 1481. 4.384
6400	V H S										18.18 1437. 4.257	19.33 1469. 4.342
6600	V H S										17.08 1421. 4.206	18.28 1456. 4.298
6800	V H S										15.99 1404. 4.151	17.27 1442. 4.253
7000	V H S											16.28 1427. 4.205
7200	V H S											15.31 1411. 4.154
7400	V H S											14.34 1393. 4.099
7600	V H S											
7800	V H S											
8000	V H S											
8200	V H S											
8400	V H S											
8600	V H S											

Table 10 (Continued)
Temperature range: 115 to 165°C

P	T	115	120	125	130	135	140	145	150	155	160	165
5	V	37890.	38380.	38860.	39350.	39840.	40330.	40820.	41310.	41790.	42280.	42770.
	H	1727.	1738.	1750.	1761.	1772.	1784.	1795.	1807.	1819.	1830.	1842.
	S	8.366	8.395	8.424	8.452	8.480	8.508	8.536	8.564	8.591	8.618	8.645
10	V	18940.	19180.	19430.	19670.	19920.	20160.	20410.	20650.	20890.	21140.	21380.
	H	1727.	1738.	1750.	1761.	1772.	1784.	1795.	1807.	1819.	1830.	1842.
	S	8.028	8.057	8.085	8.114	8.142	8.170	8.197	8.225	8.252	8.279	8.306
50	V	3780.	3830.	3880.	3930.	3980.	4030.	4080.	4130.	4170.	4220.	4270.
	H	1726.	1737.	1749.	1760.	1771.	1783.	1794.	1806.	1818.	1829.	1841.
	S	7.240	7.269	7.298	7.326	7.355	7.383	7.410	7.438	7.465	7.492	7.519
100	V	1890.	1910.	1940.	1960.	1990.	2010.	2040.	2060.	2080.	2110.	2130.
	H	1725.	1736.	1747.	1759.	1770.	1782.	1793.	1805.	1817.	1828.	1840.
	S	6.899	6.928	6.957	6.986	7.014	7.042	7.070	7.098	7.125	7.152	7.179
101.33	V	1860.	1890.	1910.	1940.	1960.	1980.	2010.	2030.	2060.	2080.	2110.
	H	1725.	1736.	1747.	1759.	1770.	1782.	1793.	1805.	1817.	1828.	1840.
	S	6.893	6.922	6.951	6.979	7.008	7.036	7.064	7.091	7.119	7.146	7.173
200	V	940.0	952.5	964.9	977.4	989.8	1000.	1010.	1030.	1040.	1050.	1060.
	H	1722.	1733.	1745.	1756.	1768.	1780.	1791.	1803.	1815.	1826.	1838.
	S	6.556	6.585	6.614	6.643	6.672	6.700	6.728	6.756	6.783	6.811	6.838
300	V	624.2	632.6	641.0	649.4	657.7	666.0	674.4	682.7	691.0	699.3	707.7
	H	1719.	1731.	1742.	1754.	1766.	1777.	1789.	1801.	1812.	1824.	1836.
	S	6.353	6.383	6.412	6.441	6.469	6.498	6.526	6.554	6.582	6.609	6.636
400	V	466.3	472.7	479.0	485.3	491.7	498.0	504.3	510.6	516.9	523.1	529.4
	H	1716.	1728.	1740.	1751.	1763.	1775.	1787.	1799.	1810.	1822.	1834.
	S	6.208	6.237	6.267	6.296	6.325	6.353	6.382	6.410	6.438	6.465	6.493
500	V	371.6	376.7	381.8	386.9	392.0	397.1	402.2	407.3	412.4	417.4	422.5
	H	1714.	1725.	1737.	1749.	1761.	1773.	1784.	1796.	1808.	1820.	1832.
	S	6.094	6.124	6.153	6.183	6.212	6.240	6.269	6.297	6.325	6.353	6.380
600	V	308.4	312.7	317.0	321.3	325.6	329.9	334.2	338.4	342.7	346.9	351.2
	H	1711.	1723.	1735.	1747.	1758.	1770.	1782.	1794.	1806.	1818.	1830.
	S	5.999	6.030	6.060	6.089	6.118	6.147	6.176	6.204	6.233	6.260	6.288
700	V	263.3	267.0	270.7	274.5	278.2	281.9	285.6	289.2	292.9	296.6	300.2
	H	1708.	1720.	1732.	1744.	1756.	1768.	1780.	1792.	1804.	1816.	1828.
	S	5.919	5.949	5.980	6.009	6.039	6.068	6.097	6.125	6.154	6.182	6.209
800	V	229.4	232.7	236.0	239.3	242.6	245.8	249.1	252.3	255.6	258.8	262.0
	H	1705.	1718.	1730.	1742.	1754.	1766.	1778.	1790.	1802.	1814.	1826.
	S	5.849	5.879	5.910	5.940	5.969	5.999	6.028	6.056	6.085	6.113	6.141
900	V	203.1	206.0	209.0	212.0	214.9	217.8	220.7	223.6	226.5	229.4	232.3
	H	1703.	1715.	1727.	1739.	1751.	1763.	1775.	1788.	1800.	1812.	1824.
	S	5.786	5.817	5.847	5.878	5.907	5.937	5.966	5.995	6.024	6.052	6.080

Table 10 (Continued)
Temperature range: 115 to 165°C

F	T	115	120	125	130	135	140	145	150	155	160	165
1000	V	182.0	184.7	187.4	190.1	192.7	195.4	198.0	200.7	203.3	205.9	208.6
	H	1700.	1712.	1724.	1736.	1749.	1761.	1773.	1785.	1798.	1810.	1822.
	S	5.729	5.760	5.791	5.822	5.852	5.881	5.911	5.940	5.968	5.997	6.025
1200	V	150.4	152.7	155.0	157.2	159.5	161.8	164.0	166.2	168.5	170.7	172.9
	H	1694.	1707.	1719.	1731.	1744.	1756.	1768.	1781.	1793.	1806.	1818.
	S	5.629	5.661	5.692	5.723	5.754	5.784	5.814	5.843	5.872	5.901	5.929
1400	V	127.8	129.8	131.8	133.8	135.8	137.7	139.7	141.6	143.6	145.5	147.4
	H	1688.	1701.	1714.	1726.	1739.	1751.	1764.	1776.	1789.	1801.	1814.
	S	5.543	5.575	5.607	5.639	5.669	5.700	5.730	5.760	5.789	5.818	5.847
1600	V	110.8	112.6	114.4	116.2	117.9	119.7	121.4	123.2	124.9	126.6	128.3
	H	1683.	1695.	1708.	1721.	1734.	1746.	1759.	1772.	1784.	1797.	1810.
	S	5.467	5.499	5.532	5.564	5.595	5.626	5.657	5.687	5.716	5.746	5.775
1800	V	97.62	99.26	100.9	102.5	104.1	105.7	107.2	108.8	110.4	111.9	113.4
	H	1677.	1690.	1703.	1716.	1729.	1742.	1754.	1767.	1780.	1793.	1805.
	S	5.398	5.431	5.464	5.497	5.528	5.560	5.591	5.621	5.651	5.681	5.710
2000	V	87.05	88.56	90.05	91.52	92.99	94.44	95.88	97.30	98.72	100.1	101.5
	H	1671.	1684.	1697.	1710.	1723.	1737.	1750.	1763.	1775.	1788.	1801.
	S	5.335	5.369	5.402	5.435	5.468	5.499	5.531	5.562	5.592	5.622	5.652
2200	V	78.39	79.79	81.18	82.54	83.90	85.24	86.57	87.90	89.21	90.51	91.80
	H	1664.	1678.	1692.	1705.	1718.	1732.	1745.	1758.	1771.	1784.	1797.
	S	5.276	5.311	5.345	5.379	5.412	5.444	5.476	5.507	5.538	5.568	5.598
2400	V	71.16	72.48	73.78	75.06	76.32	77.58	78.82	80.05	81.27	82.48	83.69
	H	1658.	1672.	1686.	1699.	1713.	1726.	1740.	1753.	1766.	1780.	1793.
	S	5.221	5.257	5.292	5.326	5.359	5.392	5.424	5.456	5.487	5.518	5.548
2600	V	65.04	66.28	67.51	68.72	69.91	71.09	72.25	73.41	74.55	75.69	76.82
	H	1652.	1666.	1680.	1694.	1708.	1721.	1735.	1748.	1762.	1775.	1788.
	S	5.170	5.206	5.242	5.277	5.311	5.344	5.377	5.409	5.440	5.471	5.502
2800	V	59.79	60.97	62.13	63.27	64.40	65.52	66.62	67.71	68.79	69.86	70.93
	H	1645.	1660.	1674.	1688.	1702.	1716.	1730.	1744.	1757.	1771.	1784.
	S	5.121	5.158	5.195	5.230	5.264	5.298	5.331	5.364	5.396	5.427	5.458
3000	V	55.22	56.35	57.46	58.55	59.63	60.69	61.74	62.77	63.80	64.81	65.82
	H	1639.	1653.	1668.	1683.	1697.	1711.	1725.	1739.	1753.	1766.	1780.
	S	5.075	5.113	5.150	5.186	5.221	5.255	5.289	5.322	5.354	5.386	5.417
3200	V	51.22	52.31	53.37	54.42	55.45	56.46	57.46	58.45	59.42	60.39	61.35
	H	1632.	1647.	1662.	1677.	1691.	1706.	1720.	1734.	1748.	1762.	1775.
	S	5.030	5.069	5.106	5.143	5.179	5.214	5.248	5.281	5.314	5.346	5.378
3400	V	47.68	48.73	49.76	50.76	51.75	52.72	53.68	54.63	55.56	56.49	57.40
	H	1625.	1641.	1656.	1671.	1686.	1700.	1715.	1729.	1743.	1757.	1771.
	S	4.987	5.026	5.065	5.102	5.139	5.174	5.209	5.243	5.276	5.309	5.341

Table 10 (Continued)
Temperature range: 115 to 165°C

F	T	115	120	125	130	135	140	145	150	155	160	165
3600	V	44.53	45.54	46.54	47.51	48.46	49.40	50.32	51.23	52.13	53.01	53.89
	H	1618.	1634.	1650.	1665.	1680.	1695.	1709.	1724.	1738.	1752.	1767.
	S	4.945	4.986	5.025	5.063	5.100	5.137	5.172	5.206	5.240	5.273	5.305
3800	V	41.69	42.68	43.65	44.59	45.52	46.42	47.31	48.19	49.05	49.90	50.74
	H	1611.	1627.	1643.	1659.	1674.	1689.	1704.	1719.	1733.	1748.	1762.
	S	4.904	4.946	4.986	5.025	5.063	5.100	5.136	5.171	5.205	5.238	5.271
4000	V	39.14	40.11	41.05	41.96	42.86	43.74	44.60	45.45	46.28	47.10	47.91
	H	1603.	1620.	1637.	1653.	1668.	1684.	1699.	1714.	1728.	1743.	1757.
	S	4.864	4.907	4.949	4.989	5.027	5.065	5.101	5.137	5.171	5.205	5.238
4200	V	36.82	37.76	38.68	39.58	40.45	41.30	42.14	42.96	43.77	44.57	45.35
	H	1596.	1613.	1630.	1646.	1662.	1678.	1693.	1709.	1724.	1738.	1753.
	S	4.825	4.870	4.912	4.953	4.992	5.030	5.067	5.104	5.139	5.173	5.207
4400	V	34.70	35.63	36.53	37.41	38.26	39.09	39.90	40.70	41.49	42.26	43.02
	H	1588.	1606.	1623.	1640.	1656.	1672.	1688.	1703.	1719.	1734.	1748.
	S	4.787	4.833	4.876	4.918	4.958	4.997	5.035	5.071	5.107	5.142	5.176
4600	V	32.76	33.67	34.56	35.42	36.25	37.06	37.86	38.64	39.40	40.15	40.89
	H	1580.	1599.	1616.	1633.	1650.	1666.	1682.	1698.	1713.	1729.	1744.
	S	4.750	4.796	4.841	4.884	4.925	4.965	5.003	5.040	5.076	5.112	5.146
4800	V	30.97	31.87	32.75	33.59	34.41	35.20	35.98	36.74	37.48	38.22	38.93
	H	1572.	1591.	1609.	1627.	1644.	1661.	1677.	1693.	1708.	1724.	1739.
	S	4.712	4.761	4.806	4.850	4.892	4.933	4.972	5.010	5.047	5.082	5.117
5000	V	29.31	30.21	31.07	31.90	32.71	33.49	34.25	34.99	35.72	36.43	37.13
	H	1564.	1583.	1602.	1620.	1638.	1655.	1671.	1687.	1703.	1719.	1734.
	S	4.675	4.725	4.772	4.817	4.860	4.902	4.941	4.980	5.017	5.054	5.089
5200	V	27.77	28.67	29.52	30.34	31.13	31.90	32.65	33.38	34.09	34.79	35.47
	H	1555.	1576.	1595.	1613.	1631.	1648.	1665.	1682.	1698.	1714.	1729.
	S	4.639	4.690	4.739	4.785	4.829	4.871	4.912	4.951	4.989	5.026	5.062
5400	V	26.34	27.23	28.08	28.89	29.67	30.43	31.16	31.88	32.58	33.26	33.93
	H	1547.	1567.	1587.	1606.	1625.	1642.	1659.	1676.	1693.	1709.	1725.
	S	4.602	4.655	4.705	4.753	4.798	4.841	4.882	4.922	4.961	4.998	5.035
5600	V	24.99	25.88	26.73	27.54	28.31	29.06	29.78	30.48	31.17	31.84	32.50
	H	1537.	1559.	1580.	1599.	1618.	1636.	1654.	1671.	1687.	1704.	1720.
	S	4.565	4.621	4.672	4.721	4.767	4.811	4.854	4.894	4.934	4.972	5.009
5800	V	23.73	24.63	25.47	26.27	27.04	27.78	28.49	29.18	29.86	30.52	31.16
	H	1528.	1551.	1572.	1592.	1611.	1630.	1648.	1665.	1682.	1699.	1715.
	S	4.528	4.586	4.639	4.690	4.737	4.782	4.825	4.867	4.907	4.945	4.983
6000	V	22.54	23.44	24.29	25.09	25.85	26.58	27.28	27.97	28.63	29.28	29.91
	H	1518.	1542.	1564.	1584.	1604.	1623.	1641.	1659.	1677.	1693.	1710.
	S	4.491	4.551	4.607	4.658	4.707	4.753	4.798	4.840	4.880	4.920	4.958

Table 10 (Continued)
Temperature range: 115 to 165°C

P	T	115	120	125	130	135	140	145	150	155	160	165
6200	V	21.42	22.32	23.17	23.97	24.73	25.45	26.15	26.83	27.48	28.12	28.74
	H	1508.	1533.	1555.	1577.	1597.	1617.	1635.	1653.	1671.	1688.	1705.
	S	4.454	4.516	4.574	4.627	4.677	4.725	4.770	4.813	4.854	4.894	4.933
6400	V	20.35	21.27	22.12	22.92	23.67	24.40	25.09	25.76	26.40	27.03	27.64
	H	1457.	1523.	1547.	1569.	1590.	1610.	1629.	1647.	1665.	1683.	1700.
	S	4.416	4.481	4.541	4.596	4.648	4.696	4.743	4.787	4.829	4.869	4.909
6600	V	19.33	20.26	21.12	21.92	22.68	23.40	24.09	24.75	25.39	26.01	26.61
	H	1466.	1513.	1538.	1561.	1582.	1603.	1623.	1641.	1660.	1678.	1695.
	S	4.377	4.446	4.508	4.565	4.618	4.668	4.716	4.761	4.803	4.845	4.885
6800	V	18.35	19.31	20.18	20.98	21.74	22.45	23.14	23.79	24.43	25.04	25.64
	H	1475.	1503.	1529.	1553.	1575.	1596.	1616.	1635.	1654.	1672.	1690.
	S	4.337	4.410	4.475	4.534	4.589	4.640	4.689	4.735	4.778	4.820	4.861
7000	V	17.41	18.39	19.28	20.09	20.85	21.56	22.24	22.89	23.52	24.13	24.72
	H	1462.	1492.	1519.	1544.	1567.	1589.	1609.	1629.	1648.	1667.	1685.
	S	4.296	4.373	4.441	4.503	4.560	4.612	4.662	4.709	4.754	4.796	4.837
7200	V	16.50	17.52	18.42	19.24	20.00	20.71	21.39	22.04	22.66	23.26	23.85
	H	1449.	1481.	1510.	1535.	1559.	1582.	1603.	1623.	1642.	1661.	1679.
	S	4.253	4.335	4.407	4.471	4.530	4.585	4.635	4.683	4.729	4.773	4.814
7400	V	15.62	16.67	17.59	18.42	19.19	19.91	20.59	21.23	21.85	22.45	23.02
	H	1435.	1470.	1499.	1526.	1551.	1574.	1596.	1617.	1636.	1655.	1674.
	S	4.209	4.297	4.373	4.440	4.501	4.557	4.609	4.658	4.705	4.749	4.792
7600	V	14.75	15.85	16.80	17.64	18.42	19.14	19.82	20.46	21.08	21.67	22.24
	H	1420.	1457.	1489.	1517.	1543.	1566.	1589.	1610.	1630.	1650.	1669.
	S	4.162	4.257	4.337	4.408	4.471	4.529	4.583	4.633	4.681	4.726	4.769
7800	V	13.89	15.06	16.04	16.90	17.68	18.41	19.09	19.73	20.34	20.93	21.50
	H	1403.	1444.	1478.	1507.	1534.	1562.	1582.	1603.	1624.	1644.	1663.
	S	4.111	4.216	4.301	4.375	4.441	4.501	4.556	4.608	4.657	4.703	4.747
8000	V	13.02	14.28	15.30	16.18	16.97	17.70	18.39	19.03	19.64	20.22	20.79
	H	1385.	1430.	1466.	1497.	1525.	1551.	1574.	1597.	1618.	1638.	1658.
	S	4.056	4.173	4.264	4.342	4.411	4.473	4.530	4.583	4.633	4.680	4.724
8200	V	12.13	13.51	14.58	15.49	16.30	17.03	17.72	18.36	18.97	19.55	20.11
	H	1363.	1415.	1454.	1487.	1516.	1542.	1567.	1590.	1612.	1632.	1652.
	S	3.995	4.127	4.226	4.308	4.380	4.445	4.503	4.558	4.609	4.657	4.702
8400	V		12.75	13.88	14.82	15.64	16.39	17.08	17.72	18.33	18.91	19.47
	H		1398.	1441.	1476.	1507.	1534.	1559.	1583.	1605.	1626.	1646.
	S		4.078	4.186	4.274	4.349	4.416	4.477	4.533	4.585	4.634	4.680
8600	V		11.97	13.19	14.17	15.01	15.77	16.46	17.11	17.72	18.30	18.85
	H		1379.	1427.	1465.	1497.	1525.	1552.	1576.	1598.	1620.	1641.
	S		4.024	4.144	4.238	4.318	4.387	4.450	4.508	4.561	4.611	4.659

Table 10 (Continued)
Temperature range: 115 to 165°C

F	T	115	120	125	130	135	140	145	150	155	160	165
8800	V		11.18	12.51	13.53	14.40	15.17	15.87	16.52	17.13	17.71	18.26
	H		1358.	1412.	1453.	1487.	1516.	1544.	1568.	1592.	1614.	1635.
	S		3.964	4.100	4.202	4.285	4.358	4.423	4.483	4.537	4.589	4.637
9000	V		10.32	11.83	12.91	13.81	14.59	15.30	15.96	16.57	17.15	17.70
	H		1332.	1396.	1440.	1476.	1507.	1535.	1561.	1585.	1608.	1629.
	S		3.893	4.053	4.164	4.253	4.329	4.396	4.457	4.514	4.566	4.615
9200	V			11.14	12.30	13.23	14.03	14.75	15.41	16.03	16.60	17.15
	H			1378.	1426.	1465.	1498.	1527.	1553.	1578.	1601.	1623.
	S			4.002	4.124	4.219	4.299	4.369	4.432	4.490	4.544	4.594
9400	V			10.44	11.70	12.67	13.49	14.22	14.89	15.51	16.08	16.63
	H			1357.	1412.	1453.	1488.	1518.	1546.	1571.	1595.	1617.
	S			3.945	4.082	4.184	4.268	4.341	4.407	4.466	4.521	4.573
9600	V			9.687	11.09	12.12	12.97	13.71	14.38	15.00	15.58	16.13
	H			1333.	1396.	1441.	1478.	1509.	1538.	1564.	1588.	1611.
	S			3.879	4.038	4.148	4.237	4.313	4.381	4.442	4.499	4.551
9800	V			8.848	10.49	11.57	12.45	13.21	13.89	14.52	15.10	15.65
	H			1302.	1379.	1428.	1467.	1500.	1530.	1557.	1581.	1605.
	S			3.797	3.989	4.110	4.205	4.285	4.355	4.418	4.476	4.530
10000	V				9.868	11.04	11.95	12.73	13.42	14.05	14.64	15.19
	H				1360.	1414.	1456.	1491.	1521.	1549.	1575.	1599.
	S				3.937	4.071	4.172	4.256	4.329	4.394	4.453	4.508
10100	V				9.549	10.77	11.70	12.49	13.19	13.82	14.41	14.96
	H				1349.	1407.	1450.	1486.	1517.	1545.	1571.	1595.
	S				3.908	4.051	4.155	4.241	4.316	4.382	4.442	4.498
10200	V				9.222	10.50	11.46	12.26	12.96	13.60	14.19	14.74
	H				1338.	1400.	1444.	1481.	1513.	1541.	1568.	1592.
	S				3.877	4.030	4.138	4.227	4.302	4.370	4.431	4.487
10300	V				8.882	10.24	11.22	12.03	12.74	13.38	13.97	14.52
	H				1325.	1392.	1438.	1476.	1508.	1538.	1564.	1589.
	S				3.844	4.008	4.121	4.212	4.289	4.357	4.419	4.476
10400	V				8.524	9.970	10.98	11.80	12.52	13.16	13.75	14.31
	H				1311.	1383.	1432.	1471.	1504.	1534.	1561.	1586.
	S				3.807	3.985	4.103	4.196	4.276	4.345	4.408	4.466
10500	V				8.141	9.701	10.74	11.58	12.30	12.95	13.54	14.10
	H				1295.	1375.	1425.	1465.	1499.	1530.	1557.	1582.
	S				3.765	3.962	4.085	4.181	4.262	4.333	4.397	4.455
10600	V				7.718	9.430	10.50	11.35	12.08	12.74	13.33	13.89
	H				1277.	1366.	1419.	1460.	1495.	1526.	1553.	1579.
	S				3.717	3.937	4.066	4.166	4.248	4.320	4.385	4.444

Table 10 (Continued)
Temperature range: 115 to 165°C

P	T	115	120	125	130	135	140	145	150	155	160	165
10700	V				7.222	9.155	10.26	11.13	11.87	12.53	13.13	13.69
	H				1253.	1356.	1412.	1455.	1490.	1521.	1550.	1576.
	S				3.656	3.912	4.048	4.150	4.234	4.308	4.374	4.433
10800	V				6.549	8.875	10.03	10.91	11.66	12.33	12.93	13.48
	H				1217.	1346.	1405.	1449.	1485.	1517.	1546.	1572.
	S				3.566	3.884	4.028	4.134	4.221	4.295	4.362	4.423
10900	V					8.590	9.794	10.70	11.46	12.12	12.73	13.29
	H					1335.	1398.	1443.	1481.	1513.	1542.	1569.
	S					3.856	4.008	4.118	4.206	4.283	4.351	4.412
11000	V					8.296	9.558	10.48	11.25	11.93	12.53	13.09
	H					1324.	1390.	1437.	1476.	1509.	1539.	1566.
	S					3.825	3.988	4.101	4.192	4.270	4.339	4.401
11100	V					7.992	9.323	10.27	11.05	11.73	12.34	12.90
	H					1311.	1382.	1431.	1471.	1505.	1535.	1562.
	S					3.792	3.966	4.084	4.178	4.257	4.327	4.390
11200	V					7.673	9.087	10.06	10.85	11.54	12.15	12.71
	H					1297.	1374.	1425.	1466.	1500.	1531.	1559.
	S					3.755	3.944	4.067	4.163	4.244	4.316	4.379
11300	V					7.334	8.849	9.850	10.65	11.34	11.96	12.53
	H					1281.	1366.	1419.	1461.	1496.	1527.	1555.
	S					3.715	3.922	4.050	4.149	4.231	4.304	4.369
11400	V					6.967	8.610	9.641	10.46	11.16	11.78	12.35
	H					1263.	1357.	1413.	1455.	1491.	1523.	1552.
	S					3.668	3.898	4.032	4.134	4.218	4.292	4.358
11500	V					6.557	8.369	9.433	10.26	10.97	11.60	12.17
	H					1241.	1348.	1406.	1450.	1487.	1519.	1548.
	S					3.613	3.873	4.014	4.119	4.205	4.280	4.347
11600	V					6.079	8.124	9.226	10.07	10.79	11.42	11.99
	H					1213.	1338.	1399.	1445.	1482.	1515.	1545.
	S					3.544	3.847	3.995	4.103	4.192	4.268	4.336
11700	V					5.480	7.875	9.019	9.882	10.60	11.24	11.82
	H					1175.	1327.	1392.	1439.	1478.	1511.	1541.
	S					3.449	3.820	3.976	4.088	4.179	4.256	4.325
11800	V					4.706	7.621	8.813	9.694	10.43	11.07	11.64
	H					1119.	1316.	1385.	1433.	1473.	1507.	1537.
	S					3.310	3.791	3.957	4.072	4.165	4.244	4.314
11900	V					3.992	7.361	8.607	9.507	10.25	10.85	11.48
	H					1058.	1304.	1377.	1428.	1468.	1503.	1534.
	S					3.160	3.761	3.936	4.056	4.151	4.232	4.303

Table 10 (Continued)
Temperature range: 115 to 165°C

P	T	115	120	125	130	135	140	145	150	155	160	165
12000	V					3.620	7.094	8.401	9.321	10.07	10.72	11.31
	H					1021.	1291.	1369.	1422.	1463.	1499.	1530.
	S					3.069	3.728	3.916	4.040	4.138	4.220	4.292
12200	V					3.315	6.528	7.986	8.953	9.726	10.35	10.98
	H					987.5	1262.	1353.	1409.	1453.	1490.	1522.
	S					2.985	3.653	3.872	4.007	4.109	4.195	4.269
12400	V					3.167	5.912	7.568	8.590	9.387	10.06	10.66
	H					969.7	1226.	1335.	1397.	1443.	1481.	1514.
	S					2.939	3.564	3.826	3.972	4.081	4.170	4.246
12600	V					3.072	5.248	7.144	8.230	9.054	9.744	10.35
	H					957.6	1183.	1315.	1383.	1432.	1472.	1507.
	S					2.908	3.456	3.775	3.936	4.051	4.144	4.224
12800	V					3.001	4.606	6.712	7.872	8.727	9.432	10.05
	H					948.3	1135.	1294.	1369.	1421.	1463.	1499.
	S					2.884	3.338	3.720	3.898	4.021	4.118	4.201
13000	V					2.945	4.097	6.270	7.516	8.404	9.127	9.752
	H					940.8	1092.	1270.	1353.	1409.	1453.	1490.
	S					2.864	3.231	3.660	3.859	3.990	4.092	4.177
13200	V					2.899	3.749	5.823	7.161	8.087	8.828	9.463
	H					934.4	1058.	1243.	1337.	1397.	1443.	1482.
	S					2.847	3.149	3.594	3.817	3.958	4.065	4.154
13400	V					2.860	3.521	5.379	6.807	7.774	8.535	9.180
	H					928.9	1035.	1215.	1320.	1385.	1433.	1473.
	S					2.832	3.089	3.523	3.773	3.925	4.038	4.130
13600	V					2.825	3.366	4.957	6.454	7.465	8.247	8.904
	H					924.1	1017.	1185.	1302.	1371.	1423.	1464.
	S					2.819	3.046	3.449	3.727	3.891	4.009	4.105
13800	V					2.795	3.253	4.580	6.105	7.160	7.965	8.635
	H					919.7	1004.	1156.	1282.	1358.	1412.	1455.
	S					2.807	3.012	3.378	3.678	3.855	3.981	4.081
14000	V					2.768	3.167	4.260	5.762	6.859	7.688	8.370
	H					915.8	993.5	1129.	1262.	1343.	1401.	1446.
	S					2.796	2.985	3.312	3.627	3.818	3.951	4.056
14200	V					2.743	3.097	4.000	5.431	6.563	7.416	8.112
	H					912.2	984.8	1106.	1241.	1328.	1389.	1436.
	S					2.786	2.962	3.254	3.574	3.780	3.921	4.030
14400	V					2.721	3.040	3.794	5.117	6.273	7.149	7.859
	H					908.9	977.4	1086.	1219.	1313.	1377.	1427.
	S					2.776	2.943	3.205	3.521	3.741	3.891	4.004

Table 10 (Continued)
Temperature range: 115 to 165°C

P	T	115	120	125	130	135	140	145	150	155	160	165
14600	V					2.700	2.991	3.630	4.827	5.990	6.888	7.611
	H					905.8	970.9	1070.	1198.	1297.	1365.	1417.
	S					2.767	2.926	3.163	3.469	3.701	3.859	3.978
14800	V					2.681	2.949	3.499	4.566	5.715	6.632	7.369
	H					902.9	965.2	1056.	1178.	1281.	1352.	1407.
	S					2.759	2.911	3.128	3.418	3.660	3.827	3.951
15000	V					2.663	2.912	3.393	4.336	5.452	6.382	7.132
	H					900.2	960.2	1044.	1159.	1264.	1340.	1396.
	S					2.751	2.897	3.098	3.372	3.618	3.794	3.924
16000	V					2.588	2.774	3.069	3.585	4.378	5.253	6.035
	H					888.9	940.6	1004.	1088.	1185.	1272.	1341.
	S					2.717	2.843	2.996	3.194	3.422	3.625	3.783
17000	V					2.529	2.680	2.895	3.225	3.733	4.405	5.118
	H					879.9	926.9	981.2	1047.	1125.	1209.	1284.
	S					2.689	2.803	2.934	3.090	3.274	3.467	3.640
18000	V					2.482	2.610	2.781	3.020	3.368	3.847	4.422
	H					872.5	916.3	965.0	1021.	1086.	1159.	1231.
	S					2.664	2.771	2.888	3.021	3.174	3.342	3.510
19000	V					2.442	2.554	2.697	2.886	3.143	3.492	3.934
	H					866.3	907.7	952.7	1003.	1059.	1122.	1188.
	S					2.643	2.744	2.852	2.971	3.104	3.250	3.402
20000	V					2.407	2.507	2.631	2.788	2.992	3.259	3.599
	H					860.8	900.5	942.9	989.0	1040.	1095.	1155.
	S					2.624	2.720	2.822	2.932	3.051	3.180	3.317
21000	V					2.377	2.468	2.577	2.711	2.881	3.095	3.364
	H					856.1	894.4	934.7	978.0	1025.	1075.	1129.
	S					2.606	2.699	2.797	2.899	3.009	3.126	3.250
22000	V					2.349	2.433	2.531	2.650	2.794	2.973	3.193
	H					851.8	889.0	927.8	968.8	1013.	1059.	1109.
	S					2.590	2.681	2.774	2.871	2.974	3.083	3.196
23000	V					2.325	2.403	2.492	2.598	2.725	2.878	3.063
	H					847.9	884.3	921.8	961.1	1003.	1046.	1093.
	S					2.575	2.663	2.753	2.847	2.944	3.046	3.152
24000	V					2.302	2.375	2.458	2.554	2.667	2.801	2.960
	H					844.4	880.1	916.5	954.4	994.0	1036.	1079.
	S					2.560	2.647	2.735	2.825	2.918	3.015	3.115
25000	V					2.282	2.351	2.427	2.515	2.617	2.737	2.877
	H					841.2	876.3	911.8	948.5	986.7	1027.	1068.
	S					2.547	2.632	2.718	2.805	2.895	2.987	3.082

Table 10 (Continued)
Temperature range: 115 to 165°C

F	T	115	120	125	130	135	140	145	150	155	160	165
26000	V					2.263	2.328	2.400	2.481	2.575	2.683	2.808
	H					838.2	872.9	907.7	943.3	980.3	1019.	1058.
	S					2.534	2.618	2.702	2.787	2.874	2.963	3.054
28000	V					2.229	2.288	2.352	2.423	2.503	2.594	2.697
	H					832.9	866.8	900.5	934.6	969.5	1006.	1043.
	S					2.510	2.593	2.674	2.755	2.837	2.921	3.006
30000	V					2.199	2.254	2.312	2.375	2.446	2.524	2.612
	H					828.2	861.7	894.5	927.4	960.9	995.2	1030.
	S					2.488	2.569	2.648	2.726	2.805	2.885	2.965
32000	V					2.173	2.224	2.277	2.334	2.397	2.467	2.544
	H					824.1	857.3	889.4	921.4	953.7	986.6	1020.
	S					2.467	2.548	2.625	2.701	2.777	2.853	2.931
34000	V					2.149	2.197	2.247	2.299	2.356	2.419	2.487
	H					820.3	853.4	885.1	916.4	947.7	979.5	1012.
	S					2.447	2.528	2.604	2.678	2.752	2.826	2.900
36000	V					2.127	2.173	2.219	2.268	2.320	2.377	2.439
	H					816.8	850.0	881.4	912.1	942.7	973.5	1005.
	S					2.428	2.509	2.584	2.657	2.729	2.801	2.873
38000	V					2.107	2.151	2.195	2.240	2.289	2.341	2.397
	H					813.6	846.9	878.1	908.4	938.3	968.4	998.9
	S					2.410	2.491	2.566	2.638	2.708	2.778	2.848
40000	V					2.089	2.131	2.173	2.215	2.261	2.309	2.361
	H					810.7	844.2	875.3	905.2	934.6	964.1	993.7
	S					2.392	2.474	2.549	2.620	2.689	2.757	2.825
42000	V					2.072	2.113	2.152	2.193	2.235	2.280	2.328
	H					807.9	841.7	872.8	902.4	931.4	960.3	989.3
	S					2.375	2.458	2.532	2.603	2.671	2.738	2.805
44000	V					2.056	2.096	2.134	2.172	2.212	2.254	2.299
	H					805.3	839.5	870.6	900.0	928.7	957.0	985.5
	S					2.359	2.442	2.517	2.587	2.654	2.720	2.785
46000	V					2.042	2.080	2.117	2.153	2.191	2.230	2.273
	H					802.8	837.4	868.6	897.9	926.3	954.2	982.1
	S					2.343	2.427	2.502	2.572	2.638	2.703	2.767
48000	V					2.028	2.065	2.101	2.136	2.171	2.209	2.248
	H					800.4	835.5	866.9	896.1	924.2	951.8	979.3
	S					2.327	2.412	2.488	2.557	2.623	2.687	2.750
50000	V					2.015	2.051	2.086	2.119	2.153	2.189	2.226
	H					798.1	833.8	865.3	894.5	922.5	949.7	976.8
	S					2.311	2.398	2.474	2.544	2.609	2.673	2.735

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
5	V	432.60.	437.50.	442.40.	447.20.	452.10.	457.00.	461.90.	466.80.	471.70.	476.50.	481.40.
	H	1854.	1866.	1877.	1889.	1901.	1913.	1925.	1938.	1950.	1962.	1974.
	S	8.672	8.698	8.724	8.750	8.776	8.802	8.828	8.853	8.879	8.904	8.929
10	V	216.30.	218.70.	221.20.	223.60.	226.00.	228.50.	230.90.	233.40.	235.80.	238.20.	240.70.
	H	1854.	1866.	1877.	1889.	1901.	1913.	1925.	1937.	1950.	1962.	1974.
	S	8.333	8.360	8.386	8.412	8.438	8.464	8.489	8.515	8.540	8.565	8.590
50	V	432.0.	437.0.	442.0.	447.0.	452.0.	457.0.	462.0.	466.0.	471.0.	476.0.	481.0.
	H	1853.	1865.	1877.	1889.	1901.	1913.	1925.	1937.	1949.	1961.	1973.
	S	7.546	7.573	7.599	7.625	7.651	7.677	7.703	7.728	7.754	7.779	7.804
100	V	216.0.	218.0.	221.0.	223.0.	226.0.	228.0.	231.0.	233.0.	235.0.	238.0.	240.0.
	H	1852.	1864.	1876.	1888.	1900.	1912.	1924.	1936.	1948.	1960.	1973.
	S	7.206	7.233	7.259	7.285	7.312	7.337	7.363	7.389	7.414	7.439	7.464
101.33	V	213.0.	215.0.	218.0.	220.0.	223.0.	225.0.	228.0.	230.0.	232.0.	235.0.	237.0.
	H	1852.	1864.	1876.	1888.	1900.	1912.	1924.	1936.	1948.	1960.	1973.
	S	7.200	7.226	7.253	7.279	7.305	7.331	7.357	7.382	7.407	7.433	7.458
200	V	108.0.	109.0.	110.0.	111.0.	113.0.	114.0.	115.0.	116.0.	118.0.	119.0.	120.0.
	H	1850.	1862.	1874.	1886.	1898.	1910.	1922.	1934.	1947.	1959.	1971.
	S	6.865	6.891	6.918	6.944	6.970	6.996	7.022	7.048	7.073	7.098	7.123
300	V	716.0	724.2	732.5	740.8	749.1	757.4	765.6	773.9	782.2	790.4	798.7
	H	1848.	1860.	1872.	1884.	1896.	1908.	1920.	1933.	1945.	1957.	1970.
	S	6.663	6.690	6.717	6.743	6.770	6.796	6.821	6.847	6.873	6.898	6.923
400	V	535.7	541.9	548.2	554.4	560.7	566.9	573.2	579.4	585.6	591.9	598.1
	H	1846.	1858.	1870.	1882.	1894.	1907.	1919.	1931.	1943.	1956.	1968.
	S	6.520	6.547	6.573	6.600	6.626	6.652	6.678	6.704	6.730	6.755	6.780
500	V	427.5	432.6	437.6	442.6	447.6	452.7	457.7	462.7	467.7	472.7	477.7
	H	1844.	1856.	1868.	1880.	1893.	1905.	1917.	1929.	1942.	1954.	1966.
	S	6.408	6.435	6.462	6.488	6.515	6.541	6.567	6.593	6.618	6.644	6.669
600	V	355.4	359.6	363.8	368.1	372.3	376.5	380.7	384.9	389.1	393.3	397.5
	H	1842.	1854.	1866.	1879.	1891.	1903.	1915.	1928.	1940.	1952.	1965.
	S	6.315	6.343	6.369	6.396	6.423	6.449	6.475	6.501	6.527	6.552	6.578
700	V	303.9	307.5	311.2	314.8	318.4	322.1	325.7	329.3	332.9	336.5	340.2
	H	1840.	1852.	1865.	1877.	1889.	1901.	1914.	1926.	1938.	1951.	1963.
	S	6.237	6.264	6.291	6.318	6.345	6.371	6.397	6.423	6.449	6.475	6.500
800	V	265.3	268.5	271.7	274.9	278.1	281.3	284.5	287.6	290.8	294.0	297.2
	H	1838.	1850.	1863.	1875.	1887.	1900.	1912.	1924.	1937.	1949.	1962.
	S	6.168	6.196	6.223	6.250	6.277	6.303	6.329	6.355	6.381	6.407	6.432
900	V	235.2	238.1	240.9	243.8	246.7	249.5	252.4	255.2	258.1	260.9	263.7
	H	1836.	1849.	1861.	1873.	1885.	1898.	1910.	1923.	1935.	1948.	1960.
	S	6.108	6.135	6.162	6.189	6.216	6.243	6.269	6.295	6.321	6.347	6.373

Table 10 (Continued)
Temperature range: 170 to 220°C

F	T	170	175	180	185	190	195	200	205	210	215	220
1000	V	211.2	213.8	216.4	219.0	221.5	224.1	226.7	229.3	231.8	234.4	237.0
	H	1834.	1847.	1859.	1871.	1884.	1896.	1909.	1921.	1934.	1946.	1959.
	S	6.053	6.080	6.108	6.135	6.162	6.189	6.215	6.241	6.267	6.293	6.319
1200	V	175.1	177.3	179.5	181.7	183.9	186.0	188.2	190.4	192.5	194.7	196.8
	H	1830.	1843.	1855.	1868.	1880.	1893.	1905.	1918.	1930.	1943.	1956.
	S	5.957	5.985	6.013	6.040	6.067	6.094	6.121	6.147	6.173	6.199	6.225
1400	V	149.3	151.2	153.1	155.0	156.9	158.8	160.7	162.6	164.4	166.3	168.2
	H	1826.	1839.	1851.	1864.	1877.	1889.	1902.	1914.	1927.	1940.	1952.
	S	5.875	5.903	5.931	5.959	5.986	6.013	6.040	6.066	6.093	6.119	6.145
1600	V	130.0	131.7	133.4	135.1	136.7	138.4	140.1	141.7	143.4	145.0	146.7
	H	1822.	1835.	1848.	1860.	1873.	1886.	1898.	1911.	1924.	1936.	1949.
	S	5.803	5.832	5.860	5.888	5.915	5.942	5.969	5.996	6.022	6.049	6.075
1800	V	115.0	116.5	118.0	119.5	121.0	122.5	124.0	125.5	127.0	128.5	130.0
	H	1818.	1831.	1844.	1856.	1869.	1882.	1895.	1908.	1920.	1933.	1946.
	S	5.739	5.768	5.796	5.824	5.852	5.879	5.906	5.933	5.960	5.986	6.012
2000	V	102.9	104.3	105.7	107.1	108.5	109.8	111.2	112.5	113.9	115.2	116.6
	H	1814.	1827.	1840.	1853.	1866.	1878.	1891.	1904.	1917.	1930.	1943.
	S	5.681	5.710	5.738	5.766	5.794	5.822	5.849	5.876	5.903	5.930	5.956
2200	V	93.09	94.37	95.64	96.91	98.17	99.43	100.7	101.9	103.2	104.4	105.6
	H	1810.	1823.	1836.	1849.	1862.	1875.	1888.	1901.	1914.	1927.	1940.
	S	5.627	5.656	5.685	5.714	5.742	5.770	5.797	5.824	5.851	5.878	5.905
2400	V	84.88	86.07	87.25	88.43	89.60	90.76	91.92	93.07	94.22	95.37	96.51
	H	1806.	1819.	1832.	1845.	1858.	1871.	1884.	1897.	1910.	1924.	1937.
	S	5.578	5.607	5.636	5.665	5.693	5.721	5.749	5.777	5.804	5.831	5.857
2600	V	77.94	79.05	80.15	81.25	82.34	83.43	84.51	85.59	86.66	87.72	88.79
	H	1802.	1815.	1828.	1841.	1855.	1868.	1881.	1894.	1907.	1920.	1933.
	S	5.532	5.561	5.591	5.620	5.648	5.677	5.704	5.732	5.759	5.787	5.813
2800	V	71.98	73.02	74.06	75.09	76.12	77.14	78.16	79.17	80.17	81.17	82.17
	H	1798.	1811.	1824.	1838.	1851.	1864.	1877.	1891.	1904.	1917.	1930.
	S	5.489	5.519	5.548	5.577	5.606	5.635	5.663	5.691	5.718	5.745	5.772
3000	V	66.81	67.80	68.78	69.76	70.73	71.69	72.65	73.60	74.55	75.49	76.43
	H	1793.	1807.	1820.	1834.	1847.	1860.	1874.	1887.	1900.	1914.	1927.
	S	5.448	5.478	5.508	5.537	5.566	5.595	5.623	5.651	5.679	5.707	5.734
3200	V	62.29	63.23	64.16	65.09	66.01	66.92	67.83	68.73	69.63	70.52	71.41
	H	1789.	1803.	1816.	1830.	1843.	1857.	1870.	1884.	1897.	1910.	1924.
	S	5.409	5.440	5.470	5.499	5.529	5.558	5.586	5.614	5.642	5.670	5.697
3400	V	58.30	59.20	60.09	60.97	61.84	62.71	63.57	64.43	65.29	66.13	66.98
	H	1785.	1799.	1812.	1826.	1840.	1853.	1867.	1880.	1894.	1907.	1921.
	S	5.372	5.403	5.434	5.463	5.493	5.522	5.551	5.579	5.607	5.635	5.663

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
3600	V	54.75	55.61	56.46	57.30	58.14	58.97	59.79	60.61	61.43	62.23	63.04
	H	1781.	1794.	1808.	1822.	1836.	1849.	1863.	1877.	1890.	1904.	1917.
	S	5.337	5.368	5.399	5.429	5.459	5.488	5.517	5.546	5.574	5.602	5.630
3800	V	51.58	52.40	53.22	54.02	54.82	55.62	56.41	57.19	57.97	58.74	59.51
	H	1776.	1790.	1804.	1818.	1832.	1846.	1860.	1873.	1887.	1901.	1914.
	S	5.303	5.335	5.366	5.396	5.426	5.456	5.485	5.514	5.542	5.571	5.598
4000	V	48.72	49.51	50.29	51.07	51.84	52.60	53.36	54.11	54.86	55.60	56.34
	H	1772.	1786.	1800.	1814.	1828.	1842.	1856.	1870.	1883.	1897.	1911.
	S	5.271	5.303	5.334	5.365	5.395	5.425	5.454	5.483	5.512	5.540	5.568
4200	V	46.13	46.89	47.65	48.40	49.14	49.87	50.60	51.33	52.04	52.76	53.47
	H	1767.	1782.	1796.	1810.	1824.	1838.	1852.	1866.	1880.	1894.	1908.
	S	5.239	5.272	5.303	5.334	5.365	5.395	5.425	5.454	5.483	5.511	5.539
4400	V	43.77	44.51	45.24	45.96	46.68	47.39	48.09	48.79	49.49	50.17	50.86
	H	1763.	1778.	1792.	1806.	1820.	1835.	1849.	1863.	1877.	1891.	1904.
	S	5.209	5.242	5.274	5.305	5.336	5.366	5.396	5.426	5.455	5.483	5.512
4600	V	41.62	42.33	43.04	43.74	44.44	45.12	45.80	46.48	47.15	47.81	48.47
	H	1759.	1773.	1788.	1802.	1817.	1831.	1845.	1859.	1873.	1887.	1901.
	S	5.180	5.213	5.245	5.277	5.308	5.339	5.369	5.398	5.428	5.456	5.485
4800	V	39.64	40.34	41.03	41.71	42.38	43.04	43.70	44.36	45.00	45.65	46.28
	H	1754.	1769.	1784.	1798.	1813.	1827.	1841.	1856.	1870.	1884.	1898.
	S	5.151	5.185	5.217	5.249	5.281	5.312	5.342	5.372	5.401	5.430	5.459
5000	V	37.82	38.50	39.17	39.83	40.48	41.13	41.77	42.40	43.03	43.65	44.27
	H	1749.	1764.	1779.	1794.	1809.	1823.	1838.	1852.	1866.	1880.	1895.
	S	5.124	5.157	5.190	5.223	5.254	5.286	5.316	5.346	5.376	5.405	5.434
5200	V	36.14	36.80	37.46	38.10	38.74	39.36	39.98	40.60	41.21	41.81	42.41
	H	1745.	1760.	1775.	1790.	1805.	1819.	1834.	1848.	1863.	1877.	1891.
	S	5.097	5.131	5.164	5.197	5.229	5.260	5.291	5.321	5.351	5.381	5.410
5400	V	34.59	35.23	35.87	36.50	37.11	37.73	38.33	38.93	39.52	40.11	40.69
	H	1740.	1756.	1771.	1786.	1801.	1816.	1830.	1845.	1859.	1874.	1888.
	S	5.070	5.105	5.138	5.172	5.204	5.236	5.267	5.297	5.327	5.357	5.386
5600	V	33.14	33.77	34.39	35.00	35.61	36.21	36.79	37.38	37.96	38.53	39.09
	H	1736.	1751.	1767.	1782.	1797.	1812.	1827.	1841.	1856.	1870.	1885.
	S	5.044	5.079	5.114	5.147	5.180	5.212	5.243	5.274	5.304	5.334	5.363
5800	V	31.79	32.41	33.02	33.62	34.21	34.79	35.36	35.93	36.50	37.05	37.61
	H	1731.	1747.	1762.	1778.	1793.	1808.	1823.	1838.	1852.	1867.	1881.
	S	5.019	5.055	5.089	5.123	5.156	5.188	5.220	5.251	5.281	5.312	5.341
6000	V	30.53	31.14	31.73	32.32	32.90	33.47	34.03	34.58	35.13	35.68	36.22
	H	1726.	1742.	1758.	1773.	1789.	1804.	1819.	1834.	1849.	1863.	1878.
	S	4.995	5.030	5.065	5.099	5.133	5.165	5.197	5.229	5.259	5.290	5.319

Table 10 (Continued)
Temperature range: 170 to 220°C

F	T	170	175	180	185	190	195	200	205	210	215	220
6200	V	29.35	29.94	30.53	31.10	31.67	32.23	32.78	33.32	33.86	34.39	34.91
	H	17.21.	1738.	1754.	1769.	1785.	1800.	1815.	1830.	1845.	1860.	1875.
	S	4.970	5.007	5.042	5.076	5.110	5.143	5.175	5.207	5.238	5.268	5.298
6400	V	28.24	28.83	29.40	29.96	30.52	31.06	31.60	32.14	32.66	33.18	33.69
	H	17.17.	1733.	1749.	1765.	1781.	1796.	1811.	1827.	1842.	1857.	1871.
	S	4.946	4.983	5.019	5.054	5.088	5.121	5.153	5.185	5.217	5.247	5.278
6600	V	27.20	27.77	28.34	28.89	29.44	29.97	30.50	31.02	31.54	32.05	32.55
	H	17.12.	1728.	1745.	1761.	1777.	1792.	1808.	1823.	1838.	1853.	1868.
	S	4.923	4.960	4.996	5.032	5.066	5.099	5.132	5.164	5.196	5.227	5.257
6800	V	26.22	26.78	27.34	27.88	28.42	28.94	29.46	29.97	30.48	30.98	31.47
	H	17.07.	1724.	1740.	1756.	1772.	1788.	1804.	1819.	1834.	1850.	1865.
	S	4.900	4.938	4.974	5.010	5.044	5.078	5.111	5.144	5.176	5.207	5.238
7000	V	25.29	25.85	26.40	26.93	27.46	27.97	28.48	28.98	29.48	29.97	30.45
	H	17.02.	1719.	1736.	1752.	1768.	1784.	1800.	1815.	1831.	1846.	1861.
	S	4.877	4.915	4.952	4.988	5.023	5.058	5.091	5.124	5.156	5.187	5.218
7200	V	24.41	24.96	25.50	26.03	26.55	27.06	27.56	28.05	28.54	29.02	29.49
	H	16.97.	1714.	1731.	1748.	1764.	1780.	1796.	1812.	1827.	1843.	1858.
	S	4.855	4.893	4.931	4.967	5.003	5.037	5.071	5.104	5.136	5.168	5.199
7400	V	23.58	24.13	24.66	25.18	25.69	26.19	26.68	27.17	27.64	28.11	28.58
	H	16.92.	1709.	1727.	1743.	1760.	1776.	1792.	1808.	1824.	1839.	1854.
	S	4.832	4.872	4.910	4.947	4.982	5.017	5.051	5.085	5.117	5.149	5.180
7600	V	22.79	23.33	23.86	24.37	24.87	25.37	25.85	26.33	26.80	27.26	27.72
	H	16.87.	1705.	1722.	1739.	1756.	1772.	1788.	1804.	1820.	1836.	1851.
	S	4.810	4.850	4.889	4.926	4.962	4.998	5.032	5.066	5.098	5.131	5.162
7800	V	22.04	22.58	23.10	23.60	24.10	24.58	25.06	25.53	25.99	26.45	26.90
	H	16.82.	1700.	1717.	1735.	1751.	1768.	1784.	1800.	1816.	1832.	1848.
	S	4.789	4.829	4.868	4.906	4.943	4.978	5.013	5.047	5.080	5.112	5.144
8000	V	21.33	21.86	22.37	22.87	23.36	23.84	24.31	24.77	25.23	25.68	26.12
	H	16.76.	1695.	1713.	1730.	1747.	1764.	1780.	1797.	1813.	1829.	1844.
	S	4.767	4.808	4.848	4.886	4.923	4.959	4.994	5.028	5.062	5.094	5.126
8200	V	20.65	21.17	21.68	22.18	22.66	23.13	23.60	24.05	24.50	24.94	25.38
	H	16.71.	1690.	1708.	1726.	1743.	1760.	1776.	1793.	1809.	1825.	1841.
	S	4.746	4.788	4.828	4.866	4.904	4.940	4.976	5.010	5.044	5.077	5.109
8400	V	20.00	20.52	21.02	21.51	21.99	22.46	22.92	23.37	23.81	24.24	24.67
	H	16.66.	1685.	1703.	1721.	1738.	1756.	1772.	1789.	1805.	1821.	1837.
	S	4.725	4.767	4.808	4.847	4.885	4.922	4.957	4.992	5.026	5.059	5.092
8600	V	19.38	19.90	20.40	20.88	21.35	21.82	22.27	22.71	23.15	23.58	24.00
	H	16.61.	1680.	1698.	1716.	1734.	1751.	1768.	1785.	1802.	1818.	1834.
	S	4.704	4.747	4.788	4.828	4.866	4.903	4.939	4.974	5.009	5.042	5.075

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
8800	V	18.79	19.30	19.80	20.28	20.74	21.20	21.65	22.09	22.52	22.94	23.36
	H	1655.	1675.	1693.	1712.	1730.	1747.	1764.	1781.	1798.	1814.	1830.
	S	4.683	4.727	4.768	4.809	4.848	4.885	4.922	4.957	4.992	5.025	5.058
9000	V	18.22	18.73	19.22	19.70	20.16	20.61	21.06	21.49	21.91	22.33	22.74
	H	1650.	1669.	1689.	1707.	1725.	1743.	1760.	1777.	1794.	1811.	1827.
	S	4.662	4.707	4.749	4.790	4.829	4.867	4.904	4.940	4.975	5.009	5.042
9200	V	17.68	18.18	18.67	19.14	19.60	20.05	20.49	20.92	21.34	21.75	22.15
	H	1644.	1664.	1684.	1702.	1721.	1739.	1756.	1773.	1790.	1807.	1823.
	S	4.642	4.687	4.730	4.771	4.811	4.849	4.887	4.923	4.958	4.992	5.026
9400	V	17.16	17.66	18.14	18.61	19.07	19.51	19.94	20.37	20.78	21.19	21.59
	H	1638.	1659.	1679.	1698.	1716.	1734.	1752.	1769.	1787.	1803.	1820.
	S	4.621	4.667	4.711	4.753	4.793	4.832	4.869	4.906	4.941	4.976	5.010
9600	V	16.65	17.15	17.64	18.10	18.55	18.99	19.42	19.84	20.25	20.65	21.05
	H	1633.	1654.	1674.	1693.	1712.	1730.	1748.	1766.	1783.	1800.	1816.
	S	4.601	4.647	4.692	4.734	4.775	4.814	4.852	4.889	4.925	4.960	4.994
9800	V	16.17	16.67	17.15	17.61	18.06	18.50	18.92	19.34	19.74	20.14	20.53
	H	1627.	1648.	1669.	1688.	1707.	1726.	1744.	1762.	1779.	1796.	1813.
	S	4.580	4.628	4.673	4.716	4.757	4.797	4.835	4.873	4.909	4.944	4.978
10000	V	15.71	16.20	16.68	17.14	17.59	18.02	18.44	18.85	19.25	19.65	20.03
	H	1621.	1643.	1663.	1683.	1703.	1721.	1740.	1758.	1775.	1792.	1809.
	S	4.560	4.608	4.654	4.698	4.740	4.780	4.819	4.856	4.893	4.928	4.963
10100	V	15.48	15.98	16.45	16.91	17.36	17.79	18.21	18.61	19.02	19.41	19.79
	H	1618.	1640.	1661.	1681.	1700.	1719.	1738.	1756.	1773.	1790.	1807.
	S	4.550	4.598	4.645	4.689	4.731	4.771	4.810	4.848	4.885	4.920	4.955
10200	V	15.26	15.75	16.23	16.69	17.13	17.56	17.98	18.38	18.78	19.17	19.56
	H	1615.	1637.	1658.	1678.	1698.	1717.	1735.	1754.	1771.	1789.	1806.
	S	4.539	4.589	4.635	4.680	4.722	4.763	4.802	4.840	4.877	4.913	4.947
10300	V	15.04	15.54	16.01	16.47	16.91	17.34	17.75	18.16	18.55	18.94	19.32
	H	1612.	1634.	1656.	1676.	1696.	1715.	1733.	1752.	1769.	1787.	1804.
	S	4.529	4.579	4.626	4.671	4.713	4.754	4.794	4.832	4.869	4.905	4.940
10400	V	14.83	15.32	15.80	16.25	16.69	17.12	17.53	17.93	18.33	18.72	19.09
	H	1609.	1632.	1653.	1674.	1693.	1713.	1731.	1750.	1767.	1785.	1802.
	S	4.519	4.569	4.617	4.662	4.705	4.746	4.786	4.824	4.861	4.897	4.932
10500	V	14.62	15.11	15.58	16.04	16.48	16.90	17.31	17.72	18.11	18.49	18.87
	H	1606.	1629.	1650.	1671.	1691.	1710.	1729.	1747.	1765.	1783.	1800.
	S	4.509	4.560	4.607	4.653	4.696	4.738	4.778	4.816	4.853	4.890	4.925
10600	V	14.41	14.90	15.38	15.83	16.27	16.69	17.10	17.50	17.89	18.28	18.65
	H	1603.	1626.	1648.	1669.	1689.	1708.	1727.	1745.	1763.	1781.	1798.
	S	4.499	4.550	4.598	4.644	4.688	4.729	4.769	4.808	4.846	4.882	4.917

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
10700	V	14.21	14.70	15.17	15.63	16.06	16.48	16.89	17.29	17.68	18.06	18.44
	H	1600.	1623.	1645.	1666.	1686.	1706.	1725.	1743.	1762.	1779.	1797.
	S	4.489	4.540	4.589	4.635	4.679	4.721	4.761	4.800	4.838	4.875	4.910
10800	V	14.01	14.50	14.97	15.42	15.86	16.28	16.69	17.09	17.47	17.85	18.22
	H	1557.	1620.	1642.	1664.	1684.	1704.	1723.	1741.	1760.	1777.	1795.
	S	4.479	4.531	4.580	4.626	4.670	4.713	4.753	4.792	4.830	4.867	4.903
10900	V	13.81	14.30	14.78	15.23	15.66	16.08	16.49	16.88	17.27	17.65	18.02
	H	1594.	1617.	1640.	1661.	1682.	1701.	1721.	1739.	1758.	1776.	1793.
	S	4.468	4.521	4.571	4.617	4.662	4.704	4.745	4.785	4.823	4.860	4.895
11000	V	13.62	14.11	14.58	15.03	15.46	15.88	16.29	16.68	17.07	17.44	17.81
	H	1591.	1615.	1637.	1659.	1679.	1699.	1718.	1737.	1756.	1774.	1791.
	S	4.458	4.512	4.561	4.609	4.653	4.696	4.737	4.777	4.815	4.852	4.888
11100	V	13.43	13.92	14.39	14.84	15.27	15.69	16.09	16.49	16.87	17.25	17.61
	H	1568.	1612.	1634.	1656.	1677.	1697.	1716.	1735.	1754.	1772.	1789.
	S	4.448	4.502	4.552	4.600	4.645	4.688	4.729	4.769	4.807	4.845	4.881
11200	V	13.24	13.73	14.20	14.65	15.08	15.50	15.90	16.30	16.68	17.05	17.41
	H	1565.	1609.	1632.	1653.	1674.	1695.	1714.	1733.	1752.	1770.	1788.
	S	4.438	4.492	4.543	4.591	4.636	4.680	4.721	4.761	4.800	4.837	4.874
11300	V	13.06	13.55	14.02	14.47	14.90	15.31	15.72	16.11	16.49	16.86	17.22
	H	1561.	1606.	1629.	1651.	1672.	1692.	1712.	1731.	1750.	1768.	1786.
	S	4.428	4.483	4.534	4.582	4.628	4.672	4.713	4.754	4.792	4.830	4.866
11400	V	12.88	13.37	13.84	14.29	14.72	15.13	15.53	15.92	16.30	16.67	17.03
	H	1578.	1603.	1626.	1648.	1670.	1690.	1710.	1729.	1748.	1766.	1784.
	S	4.418	4.473	4.525	4.573	4.619	4.663	4.705	4.746	4.785	4.823	4.859
11500	V	12.70	13.19	13.66	14.11	14.54	14.95	15.35	15.74	16.12	16.48	16.84
	H	1575.	1600.	1623.	1646.	1667.	1688.	1708.	1727.	1746.	1764.	1782.
	S	4.407	4.463	4.516	4.565	4.611	4.655	4.698	4.738	4.777	4.815	4.852
11600	V	12.52	13.02	13.49	13.93	14.36	14.77	15.17	15.56	15.93	16.30	16.66
	H	1572.	1597.	1621.	1643.	1665.	1685.	1705.	1725.	1744.	1762.	1780.
	S	4.397	4.454	4.506	4.556	4.603	4.647	4.690	4.731	4.770	4.808	4.845
11700	V	12.35	12.84	13.31	13.76	14.19	14.60	15.00	15.38	15.76	16.12	16.48
	H	1568.	1594.	1618.	1640.	1662.	1683.	1703.	1723.	1742.	1760.	1778.
	S	4.387	4.444	4.497	4.547	4.594	4.639	4.682	4.723	4.763	4.801	4.838
11800	V	12.18	12.67	13.14	13.59	14.02	14.43	14.82	15.21	15.58	15.95	16.30
	H	1565.	1591.	1615.	1638.	1660.	1681.	1701.	1721.	1740.	1758.	1777.
	S	4.377	4.434	4.488	4.538	4.586	4.631	4.674	4.715	4.755	4.794	4.831
11900	V	12.01	12.51	12.98	13.42	13.85	14.26	14.65	15.04	15.41	15.77	16.13
	H	1562.	1588.	1612.	1635.	1657.	1678.	1699.	1719.	1738.	1756.	1775.
	S	4.366	4.425	4.479	4.530	4.578	4.623	4.666	4.708	4.748	4.786	4.824

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
12000	V	11.84	12.34	12.81	13.26	13.68	14.09	14.49	14.87	15.24	15.60	15.96
	H	1558.	1585.	1609.	1633.	1655.	1676.	1697.	1716.	1736.	1755.	1773.
	S	4.356	4.415	4.470	4.521	4.569	4.615	4.659	4.700	4.740	4.779	4.817
12200	V	11.52	12.02	12.49	12.94	13.36	13.77	14.16	14.54	14.91	15.27	15.62
	H	1551.	1578.	1603.	1627.	1650.	1671.	1692.	1712.	1732.	1751.	1769.
	S	4.335	4.396	4.452	4.504	4.553	4.599	4.643	4.685	4.726	4.765	4.803
12400	V	11.21	11.71	12.18	12.62	13.05	13.45	13.85	14.22	14.59	14.95	15.30
	H	1545.	1572.	1598.	1622.	1645.	1667.	1688.	1708.	1728.	1747.	1766.
	S	4.315	4.376	4.433	4.486	4.536	4.583	4.628	4.670	4.711	4.751	4.789
12600	V	10.90	11.40	11.88	12.32	12.74	13.15	13.54	13.92	14.28	14.64	14.98
	H	1537.	1566.	1592.	1616.	1640.	1662.	1683.	1704.	1724.	1743.	1762.
	S	4.294	4.357	4.415	4.469	4.519	4.567	4.612	4.656	4.697	4.737	4.775
12800	V	10.60	11.11	11.58	12.03	12.45	12.85	13.24	13.62	13.98	14.33	14.68
	H	1530.	1559.	1586.	1611.	1634.	1657.	1679.	1699.	1719.	1739.	1758.
	S	4.273	4.337	4.397	4.452	4.503	4.551	4.597	4.641	4.683	4.723	4.762
13000	V	10.31	10.82	11.30	11.74	12.16	12.57	12.95	13.33	13.69	14.04	14.38
	H	1523.	1553.	1580.	1605.	1629.	1652.	1674.	1695.	1715.	1735.	1754.
	S	4.251	4.318	4.378	4.434	4.486	4.535	4.582	4.626	4.668	4.709	4.748
13200	V	10.03	10.54	11.02	11.46	11.89	12.29	12.68	13.05	13.41	13.75	14.09
	H	1516.	1546.	1574.	1600.	1624.	1647.	1669.	1691.	1711.	1731.	1751.
	S	4.230	4.298	4.360	4.417	4.470	4.520	4.567	4.611	4.654	4.695	4.735
13400	V	9.751	10.27	10.75	11.19	11.62	12.02	12.40	12.77	13.13	13.48	13.81
	H	1508.	1539.	1568.	1594.	1619.	1642.	1665.	1686.	1707.	1727.	1747.
	S	4.208	4.278	4.341	4.399	4.453	4.504	4.552	4.597	4.640	4.682	4.721
13600	V	9.482	10.00	10.48	10.93	11.35	11.76	12.14	12.51	12.86	13.21	13.54
	H	1500.	1532.	1561.	1588.	1613.	1637.	1660.	1682.	1703.	1723.	1743.
	S	4.187	4.258	4.323	4.382	4.437	4.488	4.536	4.582	4.626	4.668	4.708
13800	V	9.219	9.745	10.23	10.68	11.10	11.50	11.88	12.25	12.61	12.95	13.28
	H	1492.	1525.	1555.	1582.	1608.	1632.	1655.	1677.	1699.	1719.	1739.
	S	4.165	4.238	4.304	4.365	4.420	4.472	4.521	4.568	4.612	4.654	4.695
14000	V	8.962	9.493	9.978	10.43	10.85	11.25	11.63	12.00	12.35	12.69	13.03
	H	1484.	1518.	1549.	1577.	1603.	1627.	1651.	1673.	1694.	1715.	1735.
	S	4.143	4.218	4.286	4.347	4.404	4.457	4.506	4.553	4.598	4.641	4.682
14200	V	8.712	9.247	9.734	10.19	10.61	11.01	11.39	11.76	12.11	12.45	12.78
	H	1476.	1511.	1542.	1571.	1597.	1622.	1646.	1668.	1690.	1711.	1731.
	S	4.120	4.198	4.267	4.330	4.388	4.441	4.492	4.539	4.584	4.627	4.669
14400	V	8.467	9.007	9.497	9.950	10.37	10.77	11.16	11.52	11.87	12.21	12.54
	H	1468.	1504.	1535.	1565.	1592.	1617.	1641.	1664.	1686.	1707.	1728.
	S	4.097	4.178	4.248	4.312	4.371	4.426	4.477	4.525	4.571	4.614	4.656

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
14600	V	8.228	8.772	9.266	9.720	10.14	10.55	10.93	11.29	11.64	11.98	12.30
	H	1459.	1496.	1529.	1559.	1586.	1612.	1636.	1659.	1682.	1703.	1724.
	S	4.075	4.157	4.230	4.295	4.355	4.410	4.462	4.511	4.557	4.601	4.643
14800	V	7.994	8.544	9.040	9.496	9.922	10.32	10.70	11.06	11.41	11.75	12.07
	H	1451.	1489.	1522.	1552.	1580.	1607.	1631.	1655.	1677.	1699.	1720.
	S	4.051	4.136	4.211	4.277	4.338	4.394	4.447	4.496	4.543	4.588	4.630
15000	V	7.766	8.320	8.820	9.278	9.704	10.10	10.48	10.85	11.19	11.53	11.85
	H	1442.	1481.	1515.	1546.	1575.	1601.	1626.	1650.	1673.	1695.	1716.
	S	4.028	4.115	4.192	4.260	4.322	4.379	4.432	4.482	4.529	4.574	4.617
16000	V	6.703	7.282	7.797	8.264	8.695	9.096	9.474	9.833	10.18	10.50	10.82
	H	1396.	1441.	1480.	1514.	1546.	1575.	1602.	1627.	1651.	1674.	1696.
	S	3.907	4.008	4.095	4.171	4.239	4.301	4.358	4.412	4.462	4.509	4.554
17000	V	5.780	6.370	6.895	7.369	7.804	8.206	8.584	8.940	9.279	9.603	9.915
	H	1346.	1398.	1442.	1481.	1515.	1547.	1576.	1603.	1629.	1653.	1676.
	S	3.782	3.898	3.996	4.081	4.156	4.223	4.285	4.342	4.395	4.445	4.493
18000	V	5.020	5.588	6.109	6.583	7.018	7.420	7.796	8.150	8.485	8.804	9.111
	H	1298.	1355.	1404.	1446.	1484.	1518.	1549.	1578.	1606.	1631.	1656.
	S	3.660	3.788	3.897	3.990	4.072	4.145	4.212	4.273	4.329	4.382	4.432
19000	V	4.435	4.947	5.441	5.902	6.330	6.728	7.100	7.449	7.780	8.095	8.396
	H	1253.	1313.	1365.	1411.	1452.	1489.	1523.	1554.	1582.	1609.	1635.
	S	3.549	3.682	3.799	3.900	3.989	4.068	4.139	4.204	4.264	4.320	4.373
20000	V	4.003	4.444	4.891	5.325	5.737	6.124	6.488	6.831	7.156	7.465	7.760
	H	1216.	1274.	1328.	1377.	1421.	1460.	1496.	1528.	1559.	1587.	1614.
	S	3.455	3.587	3.706	3.813	3.908	3.992	4.068	4.137	4.201	4.259	4.314
21000	V	3.689	4.058	4.450	4.846	5.232	5.601	5.953	6.286	6.603	6.905	7.194
	H	1165.	1241.	1295.	1345.	1390.	1431.	1469.	1504.	1536.	1566.	1594.
	S	3.377	3.503	3.622	3.731	3.830	3.919	3.998	4.071	4.138	4.200	4.257
22000	V	3.457	3.765	4.102	4.455	4.809	5.156	5.490	5.810	6.116	6.409	6.690
	H	1161.	1213.	1265.	1315.	1361.	1404.	1443.	1479.	1513.	1544.	1573.
	S	3.314	3.432	3.548	3.657	3.757	3.848	3.931	4.007	4.077	4.141	4.201
23000	V	3.283	3.540	3.829	4.139	4.459	4.779	5.092	5.397	5.690	5.972	6.244
	H	1141.	1190.	1240.	1289.	1335.	1378.	1418.	1455.	1490.	1522.	1553.
	S	3.262	3.373	3.483	3.589	3.690	3.782	3.868	3.946	4.018	4.085	4.147
24000	V	3.148	3.366	3.614	3.884	4.170	4.462	4.753	5.039	5.318	5.588	5.848
	H	1124.	1171.	1218.	1265.	1311.	1354.	1395.	1433.	1468.	1502.	1533.
	S	3.217	3.322	3.427	3.530	3.629	3.721	3.808	3.888	3.962	4.031	4.095
25000	V	3.040	3.228	3.442	3.678	3.932	4.196	4.464	4.731	4.994	5.250	5.500
	H	1111.	1155.	1200.	1245.	1289.	1332.	1373.	1411.	1448.	1482.	1514.
	S	3.180	3.279	3.378	3.477	3.574	3.665	3.752	3.833	3.909	3.979	4.045

Table 10 (Continued)
Temperature range: 170 to 220°C

P	T	170	175	180	185	190	195	200	205	210	215	220
26000	V	2.951	3.116	3.302	3.510	3.735	3.973	4.218	4.466	4.712	4.955	5.192
	H	1099.	1141.	1184.	1227.	1270.	1312.	1353.	1392.	1428.	1463.	1496.
	S	3.147	3.241	3.336	3.431	3.524	3.615	3.701	3.782	3.858	3.930	3.997
28000	V	2.814	2.945	3.092	3.255	3.434	3.627	3.830	4.041	4.254	4.469	4.681
	H	1081.	1119.	1159.	1199.	1239.	1279.	1318.	1356.	1393.	1428.	1462.
	S	3.092	3.179	3.266	3.354	3.441	3.527	3.610	3.690	3.766	3.839	3.907
30000	V	2.711	2.820	2.941	3.074	3.219	3.377	3.545	3.723	3.906	4.093	4.282
	H	1066.	1103.	1140.	1177.	1214.	1252.	1289.	1326.	1362.	1397.	1431.
	S	3.047	3.128	3.210	3.292	3.374	3.454	3.534	3.611	3.687	3.759	3.827
32000	V	2.629	2.723	2.826	2.937	3.059	3.190	3.331	3.481	3.638	3.801	3.967
	H	1054.	1089.	1124.	1159.	1195.	1231.	1266.	1301.	1336.	1371.	1404.
	S	3.008	3.086	3.164	3.241	3.318	3.395	3.470	3.545	3.617	3.688	3.756
34000	V	2.563	2.645	2.734	2.831	2.935	3.047	3.167	3.295	3.430	3.571	3.717
	H	1045.	1078.	1112.	1145.	1179.	1213.	1247.	1281.	1315.	1348.	1381.
	S	2.975	3.049	3.124	3.198	3.272	3.344	3.417	3.488	3.558	3.626	3.693
36000	V	2.507	2.580	2.660	2.745	2.836	2.934	3.038	3.148	3.265	3.388	3.516
	H	1037.	1069.	1101.	1134.	1166.	1199.	1232.	1264.	1297.	1329.	1361.
	S	2.945	3.017	3.089	3.160	3.231	3.301	3.370	3.439	3.506	3.573	3.638
38000	V	2.459	2.525	2.597	2.673	2.755	2.841	2.933	3.030	3.132	3.240	3.353
	H	1030.	1061.	1092.	1124.	1155.	1187.	1219.	1250.	1281.	1312.	1343.
	S	2.918	2.988	3.058	3.127	3.196	3.263	3.330	3.396	3.461	3.526	3.589
40000	V	2.417	2.478	2.543	2.612	2.686	2.764	2.846	2.932	3.023	3.119	3.219
	H	1024.	1054.	1085.	1115.	1146.	1177.	1207.	1238.	1268.	1298.	1329.
	S	2.894	2.962	3.030	3.097	3.164	3.230	3.295	3.359	3.422	3.484	3.545
42000	V	2.380	2.436	2.496	2.559	2.627	2.698	2.772	2.850	2.932	3.018	3.108
	H	1019.	1048.	1078.	1108.	1138.	1168.	1198.	1228.	1257.	1287.	1316.
	S	2.871	2.938	3.004	3.070	3.135	3.199	3.263	3.325	3.386	3.447	3.507
44000	V	2.347	2.399	2.454	2.513	2.575	2.640	2.709	2.780	2.855	2.932	3.013
	H	1014.	1043.	1072.	1102.	1131.	1160.	1190.	1219.	1247.	1276.	1305.
	S	2.850	2.915	2.980	3.044	3.108	3.171	3.233	3.294	3.355	3.414	3.472
46000	V	2.318	2.366	2.417	2.472	2.530	2.590	2.653	2.719	2.788	2.859	2.933
	H	1010.	1039.	1067.	1096.	1125.	1154.	1182.	1211.	1239.	1267.	1295.
	S	2.831	2.895	2.958	3.021	3.084	3.146	3.207	3.266	3.325	3.383	3.440
48000	V	2.291	2.336	2.384	2.435	2.489	2.545	2.604	2.665	2.729	2.795	2.863
	H	1007.	1035.	1063.	1091.	1119.	1147.	1176.	1204.	1232.	1259.	1287.
	S	2.813	2.875	2.938	2.999	3.061	3.122	3.182	3.241	3.299	3.355	3.411
50000	V	2.266	2.308	2.354	2.402	2.452	2.505	2.560	2.617	2.677	2.738	2.801
	H	1004.	1031.	1059.	1086.	1114.	1142.	1170.	1197.	1225.	1252.	1279.
	S	2.796	2.857	2.918	2.979	3.040	3.099	3.158	3.217	3.274	3.330	3.385

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
5	V	48630.	49120.	49610.	50090.	50580.	51070.	51560.	52050.	52540.	53020.	53510.
	H	1986.	1999.	2011.	2024.	2036.	2049.	2061.	2074.	2086.	2099.	2112.
	S	8.954	8.978	9.003	9.027	9.051	9.075	9.099	9.123	9.147	9.170	9.194
10	V	24310.	24560.	24800.	25050.	25290.	25530.	25780.	26020.	26270.	26510.	26750.
	H	1986.	1999.	2011.	2024.	2036.	2049.	2061.	2074.	2086.	2099.	2112.
	S	8.615	8.640	8.664	8.689	8.713	8.737	8.761	8.785	8.808	8.832	8.855
50	V	4860.	4910.	4960.	5010.	5060.	5100.	5150.	5200.	5250.	5300.	5350.
	H	1986.	1998.	2011.	2023.	2035.	2048.	2061.	2073.	2086.	2099.	2111.
	S	7.829	7.853	7.878	7.902	7.926	7.950	7.974	7.998	8.022	8.045	8.069
100	V	2430.	2450.	2480.	2500.	2530.	2550.	2580.	2600.	2620.	2650.	2670.
	H	1985.	1997.	2010.	2022.	2035.	2047.	2060.	2073.	2085.	2098.	2111.
	S	7.489	7.514	7.538	7.563	7.587	7.611	7.635	7.659	7.683	7.706	7.730
101.33	V	2400.	2420.	2440.	2470.	2490.	2520.	2540.	2570.	2590.	2610.	2640.
	H	1985.	1997.	2010.	2022.	2035.	2047.	2060.	2073.	2085.	2098.	2111.
	S	7.483	7.507	7.532	7.556	7.580	7.605	7.629	7.652	7.676	7.700	7.723
200	V	1210.	1220.	1240.	1250.	1260.	1270.	1290.	1300.	1310.	1320.	1340.
	H	1983.	1996.	2008.	2021.	2033.	2046.	2059.	2071.	2084.	2097.	2109.
	S	7.148	7.173	7.198	7.222	7.247	7.271	7.295	7.319	7.342	7.366	7.389
300	V	806.9	815.2	823.4	831.7	839.9	848.2	856.4	864.6	872.9	881.1	889.3
	H	1982.	1994.	2007.	2019.	2032.	2045.	2057.	2070.	2083.	2095.	2108.
	S	6.948	6.973	6.998	7.022	7.047	7.071	7.095	7.119	7.142	7.166	7.190
400	V	604.3	610.5	616.7	622.9	629.2	635.4	641.6	647.8	654.0	660.2	666.4
	H	1980.	1993.	2005.	2018.	2031.	2043.	2056.	2069.	2081.	2094.	2107.
	S	6.805	6.830	6.855	6.880	6.904	6.928	6.952	6.976	7.000	7.024	7.047
500	V	482.7	487.7	492.7	497.7	502.7	507.7	512.7	517.6	522.6	527.6	532.6
	H	1979.	1991.	2004.	2017.	2029.	2042.	2054.	2067.	2080.	2093.	2106.
	S	6.694	6.719	6.744	6.769	6.793	6.817	6.841	6.865	6.889	6.913	6.937
600	V	401.7	405.8	410.0	414.2	418.4	422.5	426.7	430.9	435.0	439.2	443.4
	H	1977.	1990.	2002.	2015.	2028.	2040.	2053.	2066.	2079.	2092.	2104.
	S	6.603	6.628	6.653	6.677	6.702	6.726	6.750	6.774	6.798	6.822	6.846
700	V	343.8	347.4	351.0	354.6	358.1	361.7	365.3	368.9	372.5	376.1	379.7
	H	1976.	1988.	2001.	2014.	2026.	2039.	2052.	2065.	2077.	2090.	2103.
	S	6.525	6.550	6.575	6.600	6.625	6.649	6.673	6.697	6.721	6.745	6.769
800	V	300.3	303.5	306.7	309.8	313.0	316.1	319.3	322.4	325.6	328.7	331.9
	H	1974.	1987.	2000.	2012.	2025.	2038.	2050.	2063.	2076.	2089.	2102.
	S	6.458	6.483	6.508	6.533	6.557	6.582	6.606	6.630	6.654	6.678	6.702
900	V	266.6	269.4	272.2	275.0	277.8	280.7	283.5	286.3	289.1	291.9	294.7
	H	1973.	1985.	1998.	2011.	2023.	2036.	2049.	2062.	2075.	2088.	2101.
	S	6.398	6.423	6.448	6.473	6.498	6.522	6.546	6.571	6.595	6.619	6.642

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
1000	V	239.5	242.1	244.6	247.2	249.7	252.3	254.8	257.4	259.9	262.4	265.0
	H	1971.	1984.	1997.	2009.	2022.	2035.	2048.	2061.	2073.	2086.	2099.
	S	6.344	6.369	6.394	6.419	6.444	6.469	6.493	6.517	6.541	6.565	6.589
1200	V	199.0	201.2	203.3	205.4	207.6	209.7	211.9	214.0	216.1	218.3	220.4
	H	1968.	1981.	1994.	2006.	2019.	2032.	2045.	2058.	2071.	2084.	2097.
	S	6.250	6.276	6.301	6.326	6.351	6.376	6.400	6.424	6.449	6.473	6.496
1400	V	170.0	171.9	173.8	175.6	177.5	179.3	181.2	183.0	184.8	186.7	188.5
	H	1965.	1978.	1991.	2004.	2016.	2029.	2042.	2055.	2068.	2081.	2094.
	S	6.170	6.196	6.221	6.246	6.271	6.296	6.321	6.345	6.369	6.394	6.417
1600	V	148.3	150.0	151.6	153.2	154.9	156.5	158.1	159.8	161.4	163.0	164.6
	H	1962.	1975.	1988.	2001.	2014.	2027.	2040.	2053.	2066.	2079.	2092.
	S	6.101	6.126	6.152	6.177	6.202	6.227	6.252	6.276	6.300	6.325	6.349
1800	V	131.4	132.9	134.4	135.8	137.3	138.8	140.2	141.7	143.1	144.6	146.0
	H	1959.	1972.	1985.	1998.	2011.	2024.	2037.	2050.	2063.	2076.	2089.
	S	6.038	6.064	6.090	6.115	6.140	6.165	6.190	6.215	6.239	6.263	6.287
2000	V	117.9	119.3	120.6	121.9	123.3	124.6	125.9	127.2	128.5	129.9	131.2
	H	1956.	1969.	1982.	1995.	2008.	2021.	2034.	2047.	2060.	2073.	2087.
	S	5.982	6.008	6.034	6.059	6.085	6.110	6.135	6.159	6.184	6.208	6.232
2200	V	106.9	108.1	109.3	110.5	111.8	113.0	114.2	115.4	116.6	117.8	119.0
	H	1953.	1966.	1979.	1992.	2005.	2018.	2031.	2044.	2058.	2071.	2084.
	S	5.931	5.957	5.983	6.008	6.034	6.059	6.084	6.109	6.133	6.158	6.182
2400	V	97.65	98.78	99.91	101.0	102.2	103.3	104.4	105.5	106.6	107.7	108.9
	H	1950.	1963.	1976.	1989.	2002.	2015.	2029.	2042.	2055.	2068.	2082.
	S	5.884	5.910	5.936	5.962	5.987	6.012	6.038	6.062	6.087	6.112	6.136
2600	V	89.85	90.90	91.96	93.01	94.05	95.10	96.14	97.18	98.21	99.25	100.3
	H	1947.	1960.	1973.	1986.	1999.	2013.	2026.	2039.	2052.	2066.	2079.
	S	5.840	5.866	5.892	5.918	5.944	5.969	5.994	6.019	6.044	6.069	6.093
2800	V	83.16	84.15	85.14	86.12	87.10	88.08	89.05	90.02	90.99	91.96	92.92
	H	1943.	1957.	1970.	1983.	1997.	2010.	2023.	2036.	2050.	2063.	2077.
	S	5.799	5.825	5.852	5.878	5.903	5.929	5.954	5.979	6.004	6.029	6.053
3000	V	77.37	78.30	79.23	80.15	81.07	81.99	82.91	83.82	84.73	85.64	86.55
	H	1940.	1954.	1967.	1980.	1994.	2007.	2020.	2034.	2047.	2061.	2074.
	S	5.760	5.787	5.813	5.840	5.865	5.891	5.916	5.942	5.967	5.992	6.016
3200	V	72.29	73.18	74.05	74.93	75.80	76.67	77.53	78.39	79.25	80.11	80.97
	H	1937.	1951.	1964.	1977.	1991.	2004.	2018.	2031.	2045.	2058.	2071.
	S	5.724	5.751	5.777	5.804	5.830	5.855	5.881	5.906	5.931	5.956	5.981
3400	V	67.82	68.66	69.49	70.32	71.14	71.97	72.79	73.61	74.42	75.23	76.04
	H	1934.	1948.	1961.	1974.	1988.	2001.	2015.	2028.	2042.	2055.	2069.
	S	5.690	5.717	5.743	5.770	5.796	5.822	5.847	5.873	5.898	5.923	5.948

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
3600	V	63.84	64.64	65.43	66.22	67.01	67.79	68.57	69.35	70.12	70.90	71.67
	H	1931.	1944.	1958.	1972.	1985.	1999.	2012.	2026.	2039.	2053.	2066.
	S	5.657	5.684	5.711	5.737	5.764	5.790	5.815	5.841	5.866	5.891	5.916
3800	V	60.28	61.04	61.80	62.55	63.30	64.05	64.80	65.54	66.28	67.02	67.75
	H	1928.	1941.	1955.	1969.	1982.	1996.	2009.	2023.	2037.	2050.	2064.
	S	5.626	5.653	5.680	5.707	5.733	5.759	5.785	5.810	5.836	5.861	5.886
4000	V	57.07	57.80	58.53	59.25	59.97	60.69	61.40	62.11	62.82	63.52	64.23
	H	1925.	1938.	1952.	1966.	1979.	1993.	2007.	2020.	2034.	2048.	2061.
	S	5.596	5.623	5.650	5.677	5.704	5.730	5.756	5.782	5.807	5.832	5.857
4200	V	54.17	54.87	55.57	56.26	56.95	57.64	58.33	59.01	59.69	60.36	61.04
	H	1921.	1935.	1949.	1963.	1976.	1990.	2004.	2018.	2031.	2045.	2059.
	S	5.567	5.595	5.622	5.649	5.675	5.702	5.728	5.754	5.779	5.805	5.830
4400	V	51.53	52.21	52.88	53.55	54.21	54.87	55.53	56.19	56.84	57.49	58.14
	H	1918.	1932.	1946.	1960.	1974.	1987.	2001.	2015.	2029.	2042.	2056.
	S	5.540	5.567	5.595	5.622	5.648	5.675	5.701	5.727	5.753	5.778	5.804
4600	V	49.13	49.78	50.42	51.07	51.71	52.34	52.98	53.61	54.24	54.86	55.49
	H	1915.	1929.	1943.	1957.	1971.	1984.	1998.	2012.	2026.	2040.	2054.
	S	5.513	5.541	5.568	5.596	5.622	5.649	5.675	5.701	5.727	5.753	5.778
4800	V	46.92	47.55	48.17	48.79	49.41	50.03	50.64	51.25	51.85	52.46	53.06
	H	1912.	1926.	1940.	1954.	1968.	1982.	1996.	2009.	2023.	2037.	2051.
	S	5.487	5.515	5.543	5.570	5.597	5.624	5.650	5.677	5.703	5.728	5.754
5000	V	44.88	45.49	46.10	46.70	47.30	47.89	48.49	49.07	49.66	50.24	50.82
	H	1909.	1923.	1937.	1951.	1965.	1979.	1993.	2007.	2021.	2035.	2049.
	S	5.463	5.491	5.518	5.546	5.573	5.600	5.626	5.653	5.679	5.705	5.730
5200	V	43.01	43.60	44.19	44.77	45.35	45.92	46.50	47.07	47.63	48.20	48.76
	H	1906.	1920.	1934.	1948.	1962.	1976.	1990.	2004.	2018.	2032.	2046.
	S	5.439	5.467	5.495	5.522	5.550	5.577	5.603	5.630	5.656	5.682	5.707
5400	V	41.27	41.84	42.41	42.98	43.54	44.10	44.66	45.21	45.76	46.31	46.85
	H	1902.	1917.	1931.	1945.	1959.	1973.	1987.	2001.	2015.	2029.	2043.
	S	5.415	5.444	5.472	5.499	5.527	5.554	5.581	5.607	5.633	5.659	5.685
5600	V	39.66	40.21	40.77	41.32	41.86	42.41	42.95	43.48	44.02	44.55	45.08
	H	1899.	1913.	1928.	1942.	1956.	1970.	1984.	1999.	2013.	2027.	2041.
	S	5.392	5.421	5.449	5.477	5.505	5.532	5.559	5.586	5.612	5.638	5.664
5800	V	38.15	38.70	39.23	39.77	40.30	40.83	41.35	41.88	42.39	42.91	43.43
	H	1896.	1910.	1925.	1939.	1953.	1967.	1982.	1996.	2010.	2024.	2038.
	S	5.370	5.399	5.428	5.456	5.483	5.511	5.538	5.564	5.591	5.617	5.643
6000	V	36.75	37.28	37.80	38.32	38.84	39.36	39.87	40.38	40.88	41.38	41.88
	H	1893.	1907.	1922.	1936.	1950.	1965.	1979.	1993.	2007.	2022.	2036.
	S	5.349	5.378	5.406	5.435	5.462	5.490	5.517	5.544	5.570	5.597	5.623

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
6200	V	35.44	35.95	36.46	36.97	37.48	37.98	38.48	38.97	39.46	39.95	40.44
	H	1889.	1904.	1918.	1933.	1947.	1962.	1976.	1990.	2005.	2019.	2033.
	S	5.328	5.357	5.386	5.414	5.442	5.470	5.497	5.524	5.551	5.577	5.603
6400	V	34.20	34.71	35.21	35.71	36.20	36.69	37.17	37.66	38.14	38.61	39.09
	H	1886.	1901.	1915.	1930.	1944.	1959.	1973.	1988.	2002.	2016.	2031.
	S	5.307	5.337	5.365	5.394	5.422	5.450	5.477	5.504	5.531	5.558	5.584
6600	V	33.05	33.54	34.03	34.51	35.00	35.47	35.95	36.42	36.89	37.35	37.82
	H	1883.	1898.	1912.	1927.	1942.	1956.	1971.	1985.	1999.	2014.	2028.
	S	5.287	5.317	5.346	5.374	5.403	5.431	5.458	5.485	5.512	5.539	5.565
6800	V	31.96	32.44	32.92	33.39	33.86	34.33	34.79	35.25	35.71	36.17	36.62
	H	1880.	1894.	1909.	1924.	1939.	1953.	1968.	1982.	1997.	2011.	2026.
	S	5.268	5.297	5.327	5.355	5.384	5.412	5.439	5.467	5.494	5.521	5.547
7000	V	30.93	31.40	31.87	32.33	32.80	33.25	33.71	34.16	34.60	35.05	35.49
	H	1876.	1891.	1906.	1921.	1936.	1950.	1965.	1979.	1994.	2009.	2023.
	S	5.248	5.278	5.308	5.337	5.365	5.393	5.421	5.449	5.476	5.503	5.529
7200	V	29.96	30.42	30.88	31.34	31.79	32.23	32.68	33.12	33.56	33.99	34.42
	H	1873.	1888.	1903.	1918.	1933.	1947.	1962.	1977.	1991.	2006.	2020.
	S	5.230	5.260	5.289	5.318	5.347	5.375	5.403	5.431	5.458	5.485	5.512
7400	V	29.04	29.49	29.94	30.39	30.83	31.27	31.71	32.14	32.57	32.99	33.41
	H	1870.	1885.	1900.	1915.	1930.	1945.	1959.	1974.	1989.	2003.	2018.
	S	5.211	5.241	5.271	5.300	5.329	5.358	5.386	5.413	5.441	5.468	5.495
7600	V	28.17	28.61	29.06	29.49	29.93	30.36	30.78	31.21	31.63	32.04	32.46
	H	1866.	1882.	1897.	1912.	1927.	1942.	1956.	1971.	1986.	2001.	2015.
	S	5.193	5.223	5.253	5.283	5.312	5.340	5.369	5.396	5.424	5.451	5.478
7800	V	27.34	27.78	28.21	28.64	29.07	29.49	29.91	30.32	30.74	31.15	31.55
	H	1863.	1878.	1894.	1909.	1924.	1939.	1954.	1968.	1983.	1998.	2013.
	S	5.175	5.206	5.236	5.266	5.295	5.323	5.352	5.380	5.407	5.435	5.462
8000	V	26.56	26.99	27.41	27.84	28.25	28.67	29.08	29.49	29.89	30.29	30.69
	H	1860.	1875.	1890.	1906.	1921.	1936.	1951.	1966.	1981.	1995.	2010.
	S	5.158	5.189	5.219	5.249	5.278	5.307	5.335	5.363	5.391	5.419	5.446
8200	V	25.81	26.23	26.65	27.07	27.48	27.88	28.29	28.69	29.08	29.48	29.87
	H	1856.	1872.	1887.	1903.	1918.	1933.	1948.	1963.	1978.	1993.	2008.
	S	5.141	5.172	5.202	5.232	5.261	5.290	5.319	5.347	5.375	5.403	5.430
8400	V	25.10	25.51	25.93	26.33	26.74	27.14	27.53	27.93	28.32	28.70	29.09
	H	1853.	1869.	1884.	1900.	1915.	1930.	1945.	1960.	1975.	1990.	2005.
	S	5.124	5.155	5.185	5.216	5.245	5.274	5.303	5.332	5.359	5.387	5.414
8600	V	24.42	24.83	25.23	25.64	26.03	26.43	26.82	27.20	27.59	27.97	28.34
	H	1850.	1865.	1881.	1897.	1912.	1927.	1942.	1957.	1973.	1988.	2002.
	S	5.107	5.138	5.169	5.199	5.229	5.259	5.287	5.316	5.344	5.372	5.399

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
8800	V	23.77	24.17	24.57	24.97	25.36	25.75	26.13	26.51	26.89	27.26	27.63
	H	1846.	1862.	1878.	1893.	1909.	1924.	1940.	1955.	1970.	1985.	2000.
	S	5.090	5.122	5.153	5.184	5.214	5.243	5.272	5.301	5.329	5.357	5.384
9000	V	23.15	23.55	23.94	24.33	24.72	25.10	25.47	25.85	26.22	26.59	26.95
	H	1843.	1859.	1875.	1890.	1906.	1921.	1937.	1952.	1967.	1982.	1997.
	S	5.074	5.106	5.137	5.168	5.198	5.228	5.257	5.286	5.314	5.342	5.370
9200	V	22.55	22.95	23.34	23.72	24.10	24.48	24.85	25.22	25.58	25.94	26.30
	H	1840.	1856.	1872.	1887.	1903.	1918.	1934.	1949.	1964.	1980.	1995.
	S	5.058	5.090	5.122	5.153	5.183	5.213	5.242	5.271	5.299	5.327	5.355
9400	V	21.99	22.37	22.76	23.14	23.51	23.88	24.25	24.61	24.97	25.33	25.68
	H	1836.	1852.	1868.	1884.	1900.	1915.	1931.	1946.	1962.	1977.	1992.
	S	5.043	5.075	5.106	5.137	5.168	5.198	5.227	5.256	5.285	5.313	5.341
9600	V	21.44	21.82	22.20	22.58	22.94	23.31	23.67	24.03	24.38	24.73	25.08
	H	1833.	1849.	1865.	1881.	1897.	1913.	1928.	1944.	1959.	1974.	1990.
	S	5.027	5.059	5.091	5.122	5.153	5.183	5.213	5.242	5.271	5.299	5.327
9800	V	20.92	21.30	21.67	22.04	22.40	22.76	23.12	23.47	23.82	24.17	24.51
	H	1829.	1846.	1862.	1878.	1894.	1910.	1925.	1941.	1956.	1972.	1987.
	S	5.012	5.044	5.076	5.108	5.139	5.169	5.199	5.228	5.257	5.285	5.313
10000	V	20.41	20.79	21.16	21.52	21.88	22.24	22.59	22.94	23.28	23.62	23.96
	H	1826.	1842.	1859.	1875.	1891.	1907.	1922.	1938.	1954.	1969.	1984.
	S	4.996	5.029	5.062	5.093	5.124	5.155	5.185	5.214	5.243	5.272	5.300
10100	V	20.17	20.54	20.91	21.27	21.63	21.98	22.33	22.68	23.02	23.36	23.69
	H	1824.	1841.	1857.	1873.	1889.	1905.	1921.	1937.	1952.	1968.	1983.
	S	4.989	5.022	5.054	5.086	5.117	5.148	5.178	5.207	5.236	5.265	5.293
10200	V	19.93	20.30	20.67	21.03	21.38	21.73	22.08	22.42	22.76	23.10	23.43
	H	1822.	1839.	1855.	1872.	1888.	1904.	1920.	1935.	1951.	1966.	1982.
	S	4.981	5.015	5.047	5.079	5.110	5.141	5.171	5.200	5.229	5.258	5.286
10300	V	19.70	20.06	20.43	20.78	21.14	21.49	21.83	22.17	22.51	22.84	23.17
	H	1821.	1837.	1854.	1870.	1886.	1902.	1918.	1934.	1949.	1965.	1980.
	S	4.974	5.007	5.040	5.072	5.103	5.134	5.164	5.193	5.223	5.251	5.280
10400	V	19.47	19.83	20.19	20.55	20.90	21.25	21.59	21.93	22.26	22.59	22.92
	H	1819.	1836.	1852.	1869.	1885.	1901.	1917.	1932.	1948.	1964.	1979.
	S	4.967	5.000	5.033	5.065	5.096	5.127	5.157	5.187	5.216	5.245	5.273
10500	V	19.24	19.60	19.96	20.32	20.66	21.01	21.35	21.69	22.02	22.35	22.67
	H	1817.	1834.	1851.	1867.	1883.	1899.	1915.	1931.	1947.	1962.	1978.
	S	4.959	4.993	5.025	5.058	5.089	5.120	5.150	5.180	5.209	5.238	5.267
10600	V	19.02	19.38	19.74	20.09	20.44	20.78	21.12	21.45	21.78	22.11	22.43
	H	1816.	1832.	1849.	1865.	1882.	1898.	1914.	1930.	1945.	1961.	1977.
	S	4.952	4.986	5.018	5.051	5.082	5.113	5.143	5.173	5.203	5.232	5.260

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
10700	V	18.80	19.16	19.52	19.87	20.21	20.55	20.89	21.22	21.55	21.87	22.19
	H	18.14	18.31	18.47	18.64	18.80	18.96	19.12	19.28	19.44	19.60	19.75
	S	4.945	4.978	5.011	5.044	5.075	5.106	5.137	5.167	5.196	5.225	5.254
10800	V	18.59	18.95	19.30	19.65	19.99	20.33	20.66	20.99	21.32	21.64	21.96
	H	18.12	18.29	18.46	18.62	18.79	18.95	19.11	19.27	19.43	19.58	19.74
	S	4.937	4.971	5.004	5.037	5.068	5.100	5.130	5.160	5.190	5.219	5.247
10900	V	18.38	18.74	19.09	19.43	19.77	20.11	20.44	20.77	21.09	21.41	21.73
	H	18.10	18.27	18.44	18.61	18.77	18.93	19.09	19.25	19.41	19.57	19.73
	S	4.930	4.964	4.997	5.030	5.062	5.093	5.123	5.154	5.183	5.212	5.241
11000	V	18.17	18.53	18.88	19.22	19.56	19.89	20.22	20.55	20.87	21.19	21.51
	H	18.09	18.26	18.43	18.59	18.76	18.92	19.08	19.24	19.40	19.56	19.71
	S	4.923	4.957	4.990	5.023	5.055	5.086	5.117	5.147	5.177	5.206	5.235
11100	V	17.97	18.32	18.67	19.01	19.35	19.68	20.01	20.33	20.65	20.97	21.29
	H	18.07	18.24	18.41	18.58	18.74	18.90	19.07	19.23	19.39	19.54	19.70
	S	4.916	4.950	4.984	5.016	5.048	5.080	5.110	5.141	5.170	5.200	5.228
11200	V	17.77	18.12	18.47	18.81	19.14	19.47	19.80	20.12	20.44	20.76	21.07
	H	18.05	18.22	18.39	18.56	18.73	18.89	19.05	19.21	19.37	19.53	19.69
	S	4.909	4.943	4.977	5.009	5.042	5.073	5.104	5.134	5.164	5.193	5.222
11300	V	17.58	17.93	18.27	18.61	18.94	19.27	19.59	19.91	20.23	20.54	20.86
	H	18.03	18.21	18.38	18.54	18.71	18.87	19.04	19.20	19.36	19.52	19.67
	S	4.902	4.936	4.970	5.003	5.035	5.066	5.097	5.128	5.158	5.187	5.216
11400	V	17.39	17.73	18.07	18.41	18.74	19.07	19.39	19.71	20.03	20.34	20.65
	H	18.02	18.19	18.36	18.53	18.69	18.86	19.02	19.18	19.34	19.50	19.66
	S	4.895	4.929	4.963	4.996	5.028	5.060	5.091	5.121	5.151	5.181	5.210
11500	V	17.20	17.54	17.88	18.22	18.55	18.87	19.19	19.51	19.82	20.13	20.44
	H	18.00	18.17	18.34	18.51	18.68	18.84	19.01	19.17	19.33	19.49	19.65
	S	4.888	4.922	4.956	4.989	5.022	5.053	5.085	5.115	5.145	5.175	5.204
11600	V	17.01	17.36	17.69	18.03	18.36	18.68	19.00	19.31	19.62	19.93	20.24
	H	17.98	18.16	18.33	18.50	18.66	18.83	18.99	19.16	19.32	19.48	19.64
	S	4.881	4.916	4.950	4.983	5.015	5.047	5.078	5.109	5.139	5.168	5.198
11700	V	16.83	17.17	17.51	17.84	18.17	18.49	18.81	19.12	19.43	19.74	20.04
	H	17.96	18.14	18.31	18.48	18.65	18.81	18.98	19.14	19.30	19.46	19.62
	S	4.874	4.909	4.943	4.976	5.009	5.041	5.072	5.103	5.133	5.162	5.192
11800	V	16.65	16.99	17.33	17.66	17.98	18.30	18.62	18.93	19.24	19.54	19.84
	H	17.95	18.12	18.29	18.46	18.63	18.80	18.96	19.13	19.29	19.45	19.61
	S	4.867	4.902	4.936	4.970	5.002	5.034	5.066	5.096	5.127	5.156	5.185
11900	V	16.47	16.81	17.15	17.48	17.80	18.12	18.43	18.74	19.05	19.35	19.65
	H	17.93	18.10	18.28	18.45	18.62	18.78	18.95	19.11	19.28	19.44	19.60
	S	4.860	4.895	4.930	4.963	4.996	5.028	5.059	5.090	5.120	5.150	5.180

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
12000	V	16.30	16.64	16.97	17.30	17.62	17.94	18.25	18.56	18.86	19.16	19.46
	H	1791.	1809.	1826.	1843.	1860.	1877.	1894.	1910.	1926.	1942.	1958.
	S	4.853	4.868	4.923	4.957	4.989	5.022	5.053	5.084	5.114	5.144	5.174
12200	V	15.96	16.30	16.63	16.95	17.27	17.58	17.89	18.20	18.50	18.80	19.09
	H	1787.	1805.	1823.	1840.	1857.	1874.	1891.	1907.	1923.	1940.	1956.
	S	4.840	4.875	4.910	4.944	4.977	5.009	5.041	5.072	5.102	5.132	5.162
12400	V	15.64	15.97	16.29	16.62	16.93	17.24	17.55	17.85	18.15	18.44	18.73
	H	1784.	1802.	1820.	1837.	1854.	1871.	1888.	1904.	1921.	1937.	1953.
	S	4.826	4.862	4.897	4.931	4.964	4.997	5.029	5.060	5.090	5.120	5.150
12600	V	15.32	15.65	15.97	16.29	16.60	16.91	17.21	17.51	17.81	18.10	18.39
	H	1780.	1798.	1816.	1834.	1851.	1868.	1885.	1901.	1918.	1934.	1951.
	S	4.813	4.849	4.884	4.918	4.952	4.984	5.016	5.048	5.079	5.109	5.139
12800	V	15.01	15.34	15.66	15.97	16.28	16.59	16.89	17.19	17.48	17.77	18.05
	H	1777.	1795.	1813.	1830.	1848.	1865.	1882.	1899.	1915.	1932.	1948.
	S	4.799	4.836	4.871	4.906	4.939	4.972	5.004	5.036	5.067	5.097	5.127
13000	V	14.71	15.04	15.36	15.67	15.98	16.28	16.58	16.87	17.16	17.45	17.73
	H	1773.	1791.	1810.	1827.	1845.	1862.	1879.	1896.	1912.	1929.	1945.
	S	4.786	4.823	4.858	4.893	4.927	4.960	4.993	5.024	5.055	5.086	5.116
13200	V	14.42	14.75	15.06	15.37	15.68	15.98	16.27	16.56	16.85	17.13	17.41
	H	1769.	1788.	1806.	1824.	1842.	1859.	1876.	1893.	1910.	1926.	1943.
	S	4.773	4.810	4.846	4.881	4.915	4.948	4.981	5.013	5.044	5.075	5.105
13400	V	14.14	14.46	14.78	15.09	15.39	15.68	15.98	16.27	16.55	16.83	17.11
	H	1766.	1785.	1803.	1821.	1838.	1856.	1873.	1890.	1907.	1924.	1940.
	S	4.760	4.797	4.833	4.869	4.903	4.936	4.969	5.001	5.033	5.063	5.094
13600	V	13.87	14.19	14.50	14.81	15.11	15.40	15.69	15.98	16.26	16.54	16.81
	H	1762.	1781.	1799.	1818.	1835.	1853.	1870.	1887.	1904.	1921.	1937.
	S	4.747	4.785	4.821	4.856	4.891	4.925	4.958	4.990	5.021	5.052	5.083
13800	V	13.61	13.92	14.23	14.54	14.83	15.12	15.41	15.70	15.97	16.25	16.52
	H	1759.	1778.	1796.	1814.	1832.	1850.	1867.	1884.	1901.	1918.	1935.
	S	4.734	4.772	4.809	4.844	4.879	4.913	4.946	4.978	5.010	5.041	5.072
14000	V	13.35	13.66	13.97	14.27	14.57	14.86	15.14	15.42	15.70	15.97	16.24
	H	1755.	1774.	1793.	1811.	1829.	1847.	1864.	1882.	1899.	1915.	1932.
	S	4.721	4.760	4.797	4.832	4.867	4.901	4.935	4.967	4.999	5.030	5.061
14200	V	13.10	13.41	13.72	14.02	14.31	14.60	14.88	15.16	15.43	15.70	15.97
	H	1751.	1770.	1789.	1808.	1826.	1844.	1861.	1879.	1896.	1913.	1930.
	S	4.709	4.747	4.784	4.821	4.856	4.890	4.923	4.956	4.988	5.020	5.050
14400	V	12.86	13.17	13.47	13.77	14.06	14.34	14.62	14.90	15.17	15.44	15.71
	H	1748.	1767.	1786.	1805.	1823.	1841.	1858.	1876.	1893.	1910.	1927.
	S	4.696	4.735	4.772	4.809	4.844	4.879	4.912	4.945	4.977	5.009	5.040

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
14600	V	12.62	12.93	13.23	13.52	13.81	14.10	14.38	14.65	14.92	15.19	15.45
	H	1744.	1763.	1783.	1801.	1820.	1838.	1855.	1873.	1890.	1907.	1924.
	S	4.684	4.723	4.760	4.797	4.833	4.867	4.901	4.934	4.967	4.998	5.029
14800	V	12.39	12.70	13.00	13.29	13.58	13.86	14.13	14.41	14.67	14.94	15.20
	H	1740.	1760.	1779.	1798.	1816.	1835.	1852.	1870.	1887.	1905.	1922.
	S	4.671	4.710	4.749	4.785	4.821	4.856	4.890	4.923	4.956	4.988	5.019
15000	V	12.16	12.47	12.77	13.06	13.34	13.62	13.90	14.17	14.43	14.70	14.95
	H	1736.	1756.	1776.	1795.	1813.	1832.	1849.	1867.	1885.	1902.	1919.
	S	4.659	4.698	4.737	4.774	4.810	4.845	4.879	4.913	4.945	4.977	5.009
16000	V	11.13	11.43	11.72	12.00	12.27	12.54	12.81	13.07	13.33	13.58	13.83
	H	1718.	1738.	1758.	1778.	1797.	1816.	1835.	1853.	1871.	1888.	1906.
	S	4.598	4.639	4.679	4.717	4.754	4.791	4.826	4.860	4.894	4.926	4.958
17000	V	10.22	10.51	10.79	11.06	11.33	11.59	11.85	12.10	12.35	12.59	12.83
	H	1698.	1720.	1741.	1761.	1781.	1801.	1820.	1838.	1857.	1875.	1893.
	S	4.538	4.581	4.622	4.662	4.701	4.738	4.774	4.809	4.844	4.877	4.910
18000	V	9.405	9.690	9.966	10.23	10.50	10.75	11.00	11.24	11.48	11.72	11.95
	H	1679.	1702.	1723.	1744.	1765.	1785.	1805.	1824.	1843.	1861.	1879.
	S	4.479	4.524	4.567	4.609	4.648	4.687	4.724	4.760	4.795	4.830	4.863
19000	V	8.685	8.964	9.234	9.496	9.750	9.998	10.24	10.48	10.71	10.94	11.16
	H	1660.	1683.	1706.	1728.	1749.	1769.	1790.	1809.	1829.	1847.	1866.
	S	4.422	4.469	4.514	4.556	4.597	4.637	4.675	4.713	4.749	4.784	4.818
20000	V	8.043	8.316	8.580	8.836	9.084	9.326	9.562	9.792	10.02	10.24	10.46
	H	1640.	1664.	1688.	1711.	1732.	1754.	1774.	1795.	1814.	1834.	1853.
	S	4.366	4.415	4.461	4.505	4.548	4.589	4.628	4.666	4.703	4.739	4.774
21000	V	7.471	7.737	7.995	8.244	8.486	8.722	8.952	9.176	9.396	9.611	9.822
	H	1620.	1646.	1670.	1694.	1716.	1738.	1759.	1780.	1800.	1820.	1840.
	S	4.311	4.362	4.410	4.456	4.499	4.542	4.582	4.621	4.659	4.696	4.732
22000	V	6.960	7.220	7.471	7.714	7.950	8.179	8.403	8.621	8.834	9.044	9.249
	H	1601.	1627.	1652.	1677.	1700.	1723.	1744.	1766.	1786.	1807.	1827.
	S	4.257	4.310	4.360	4.407	4.452	4.496	4.537	4.577	4.616	4.654	4.690
23000	V	6.505	6.757	7.001	7.237	7.467	7.690	7.907	8.120	8.327	8.531	8.730
	H	1582.	1609.	1635.	1660.	1684.	1707.	1730.	1751.	1773.	1793.	1814.
	S	4.205	4.260	4.311	4.360	4.407	4.451	4.494	4.535	4.575	4.613	4.650
24000	V	6.101	6.345	6.581	6.810	7.033	7.249	7.460	7.667	7.868	8.066	8.259
	H	1563.	1591.	1618.	1643.	1668.	1692.	1715.	1737.	1759.	1780.	1801.
	S	4.155	4.211	4.264	4.314	4.362	4.408	4.451	4.493	4.534	4.573	4.611
25000	V	5.742	5.977	6.205	6.426	6.642	6.852	7.057	7.257	7.452	7.644	7.832
	H	1544.	1573.	1601.	1627.	1652.	1677.	1700.	1723.	1745.	1767.	1788.
	S	4.106	4.164	4.218	4.270	4.319	4.366	4.410	4.453	4.495	4.535	4.573

Table 10 (Continued)
Temperature range: 225 to 275°C

P	T	225	230	235	240	245	250	255	260	265	270	275
26000	V	5.423	5.649	5.868	6.082	6.290	6.493	6.692	6.885	7.075	7.261	7.443
	H	1527.	1556.	1584.	1611.	1637.	1662.	1686.	1710.	1732.	1754.	1776.
	S	4.059	4.118	4.174	4.227	4.277	4.325	4.370	4.414	4.457	4.497	4.537
28000	V	4.891	5.097	5.298	5.496	5.689	5.878	6.063	6.244	6.422	6.596	6.767
	H	1494.	1524.	1553.	1581.	1608.	1634.	1659.	1683.	1706.	1729.	1751.
	S	3.972	4.033	4.091	4.146	4.198	4.247	4.295	4.340	4.384	4.426	4.467
30000	V	4.470	4.657	4.841	5.022	5.201	5.376	5.547	5.716	5.882	6.045	6.205
	H	1464.	1495.	1525.	1553.	1581.	1608.	1633.	1658.	1682.	1706.	1728.
	S	3.893	3.955	4.014	4.071	4.124	4.175	4.224	4.271	4.316	4.359	4.401
32000	V	4.135	4.304	4.471	4.637	4.801	4.963	5.122	5.279	5.433	5.585	5.735
	H	1437.	1468.	1498.	1528.	1556.	1583.	1609.	1635.	1659.	1683.	1707.
	S	3.822	3.884	3.944	4.002	4.056	4.108	4.158	4.206	4.252	4.297	4.340
34000	V	3.866	4.018	4.169	4.321	4.472	4.621	4.769	4.915	5.058	5.200	5.340
	H	1413.	1444.	1475.	1504.	1533.	1560.	1587.	1613.	1638.	1662.	1686.
	S	3.758	3.821	3.881	3.938	3.994	4.047	4.097	4.146	4.193	4.239	4.282
36000	V	3.648	3.784	3.921	4.059	4.198	4.335	4.472	4.608	4.742	4.874	5.005
	H	1392.	1423.	1453.	1483.	1511.	1539.	1566.	1593.	1618.	1643.	1667.
	S	3.701	3.763	3.823	3.880	3.936	3.989	4.041	4.090	4.138	4.184	4.228
38000	V	3.470	3.591	3.715	3.841	3.967	4.094	4.221	4.347	4.472	4.596	4.719
	H	1374.	1404.	1434.	1463.	1492.	1520.	1547.	1574.	1600.	1625.	1649.
	S	3.651	3.711	3.770	3.828	3.883	3.937	3.988	4.038	4.087	4.133	4.178
40000	V	3.323	3.432	3.543	3.657	3.773	3.890	4.007	4.124	4.241	4.357	4.472
	H	1358.	1388.	1417.	1446.	1475.	1502.	1530.	1556.	1582.	1608.	1632.
	S	3.606	3.665	3.723	3.779	3.834	3.888	3.940	3.990	4.038	4.085	4.131
42000	V	3.201	3.298	3.399	3.502	3.607	3.715	3.823	3.932	4.041	4.150	4.258
	H	1345.	1374.	1402.	1431.	1459.	1487.	1514.	1540.	1566.	1592.	1617.
	S	3.565	3.623	3.680	3.735	3.790	3.843	3.894	3.945	3.993	4.040	4.086
44000	V	3.098	3.185	3.276	3.370	3.466	3.564	3.664	3.765	3.867	3.969	4.071
	H	1333.	1361.	1389.	1417.	1445.	1472.	1499.	1526.	1552.	1577.	1602.
	S	3.529	3.586	3.641	3.696	3.749	3.801	3.853	3.903	3.951	3.998	4.044
46000	V	3.009	3.089	3.172	3.257	3.345	3.435	3.527	3.621	3.715	3.810	3.906
	H	1323.	1351.	1378.	1405.	1432.	1459.	1486.	1512.	1538.	1563.	1588.
	S	3.496	3.552	3.606	3.659	3.712	3.763	3.814	3.863	3.912	3.959	4.005
48000	V	2.933	3.006	3.082	3.160	3.240	3.323	3.408	3.494	3.582	3.671	3.760
	H	1314.	1341.	1368.	1395.	1421.	1448.	1474.	1500.	1526.	1551.	1576.
	S	3.466	3.520	3.574	3.626	3.678	3.728	3.778	3.827	3.875	3.922	3.968
50000	V	2.866	2.934	3.003	3.075	3.149	3.225	3.303	3.383	3.465	3.548	3.632
	H	1306.	1333.	1359.	1385.	1411.	1437.	1463.	1489.	1514.	1539.	1564.
	S	3.439	3.492	3.544	3.596	3.646	3.696	3.745	3.794	3.841	3.888	3.933

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
5	V	54000.	54490.	54980.	55470.	55950.	56440.	56930.	57420.	57910.	58390.	58880.
	H	2125.	2138.	2150.	2163.	2176.	2189.	2202.	2215.	2229.	2242.	2255.
	S	9.217	9.240	9.263	9.286	9.308	9.331	9.353	9.376	9.398	9.420	9.442
10	V	27000.	27240.	27490.	27730.	27980.	28220.	28460.	28710.	28950.	29200.	29440.
	H	2125.	2138.	2150.	2163.	2176.	2189.	2202.	2215.	2228.	2242.	2255.
	S	8.878	8.901	8.924	8.947	8.970	8.993	9.015	9.037	9.060	9.082	9.104
50	V	5400.	5450.	5500.	5540.	5590.	5640.	5690.	5740.	5790.	5840.	5890.
	H	2124.	2137.	2150.	2163.	2176.	2189.	2202.	2215.	2228.	2241.	2254.
	S	8.092	8.115	8.138	8.161	8.184	8.206	8.229	8.251	8.273	8.295	8.317
100	V	2700.	2720.	2750.	2770.	2800.	2820.	2840.	2870.	2890.	2920.	2940.
	H	2124.	2136.	2149.	2162.	2175.	2188.	2201.	2214.	2228.	2241.	2254.
	S	7.753	7.776	7.799	7.822	7.845	7.867	7.890	7.912	7.934	7.956	7.978
101.33	V	2660.	2690.	2710.	2730.	2760.	2780.	2810.	2830.	2860.	2880.	2900.
	H	2124.	2136.	2149.	2162.	2175.	2188.	2201.	2214.	2227.	2241.	2254.
	S	7.746	7.769	7.792	7.815	7.838	7.861	7.883	7.906	7.928	7.950	7.972
200	V	1350.	1360.	1370.	1380.	1400.	1410.	1420.	1430.	1450.	1460.	1470.
	H	2122.	2135.	2148.	2161.	2174.	2187.	2200.	2213.	2226.	2240.	2253.
	S	7.413	7.436	7.459	7.482	7.505	7.527	7.550	7.572	7.594	7.616	7.638
300	V	897.6	905.8	914.0	922.2	930.5	938.7	946.9	955.1	963.3	971.5	979.7
	H	2121.	2134.	2147.	2160.	2173.	2186.	2199.	2212.	2225.	2239.	2252.
	S	7.213	7.236	7.259	7.282	7.305	7.328	7.350	7.373	7.395	7.417	7.439
400	V	672.5	678.7	684.9	691.1	697.3	703.5	709.7	715.8	722.0	728.2	734.4
	H	2120.	2133.	2146.	2159.	2172.	2185.	2198.	2211.	2224.	2237.	2251.
	S	7.071	7.094	7.117	7.140	7.163	7.186	7.208	7.231	7.253	7.275	7.297
500	V	537.5	542.5	547.5	552.4	557.4	562.4	567.3	572.3	577.3	582.2	587.2
	H	2119.	2132.	2144.	2158.	2171.	2184.	2197.	2210.	2223.	2236.	2250.
	S	6.960	6.983	7.006	7.029	7.052	7.075	7.098	7.120	7.142	7.165	7.187
600	V	447.5	451.7	455.8	460.0	464.1	468.3	472.4	476.6	480.7	484.5	489.0
	H	2117.	2130.	2143.	2156.	2169.	2183.	2196.	2209.	2222.	2235.	2249.
	S	6.869	6.893	6.916	6.939	6.962	6.984	7.007	7.030	7.052	7.074	7.096
700	V	383.2	386.8	390.4	394.0	397.5	401.1	404.7	408.2	411.8	415.4	418.9
	H	2116.	2129.	2142.	2155.	2168.	2181.	2195.	2208.	2221.	2234.	2248.
	S	6.792	6.816	6.839	6.862	6.885	6.908	6.930	6.953	6.975	6.997	7.020
800	V	335.0	338.2	341.3	344.4	347.6	350.7	353.8	357.0	360.1	363.2	366.3
	H	2115.	2128.	2141.	2154.	2167.	2180.	2193.	2207.	2220.	2233.	2246.
	S	6.725	6.749	6.772	6.795	6.818	6.841	6.863	6.886	6.908	6.931	6.953
900	V	297.5	300.3	303.1	305.9	308.7	311.5	314.3	317.1	319.9	322.7	325.4
	H	2114.	2127.	2140.	2153.	2166.	2179.	2192.	2206.	2219.	2232.	2245.
	S	6.666	6.689	6.713	6.736	6.759	6.782	6.804	6.827	6.849	6.872	6.894

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
1000	V	267.5	270.0	272.6	275.1	277.6	280.1	282.7	285.2	287.7	290.2	292.7
	H	2112.	2125.	2138.	2152.	2165.	2178.	2191.	2204.	2218.	2231.	2244.
	S	6.613	6.636	6.659	6.683	6.706	6.729	6.751	6.774	6.796	6.819	6.841
1200	V	222.5	224.6	226.7	228.9	231.0	233.1	235.2	237.3	239.4	241.5	243.7
	H	2110.	2123.	2136.	2149.	2162.	2176.	2189.	2202.	2215.	2229.	2242.
	S	6.520	6.544	6.567	6.590	6.613	6.636	6.659	6.682	6.704	6.727	6.749
1400	V	190.4	192.2	194.0	195.8	197.7	199.5	201.3	203.1	205.0	206.8	208.6
	H	2107.	2121.	2134.	2147.	2160.	2173.	2187.	2200.	2213.	2227.	2240.
	S	6.441	6.465	6.488	6.512	6.535	6.558	6.581	6.604	6.626	6.649	6.671
1600	V	166.2	167.9	169.5	171.1	172.7	174.3	175.9	177.5	179.1	180.7	182.3
	H	2105.	2118.	2131.	2145.	2158.	2171.	2184.	2198.	2211.	2225.	2238.
	S	6.373	6.396	6.420	6.443	6.466	6.490	6.512	6.535	6.558	6.580	6.603
1800	V	147.5	148.9	150.4	151.8	153.3	154.7	156.1	157.6	159.0	160.4	161.9
	H	2102.	2116.	2129.	2142.	2155.	2169.	2182.	2196.	2209.	2222.	2236.
	S	6.311	6.335	6.359	6.382	6.406	6.429	6.452	6.475	6.497	6.520	6.542
2000	V	132.5	133.8	135.1	136.4	137.7	139.0	140.3	141.6	142.9	144.2	145.5
	H	2100.	2113.	2126.	2140.	2153.	2166.	2180.	2193.	2207.	2220.	2234.
	S	6.256	6.280	6.304	6.328	6.351	6.374	6.397	6.420	6.443	6.466	6.488
2200	V	120.2	121.4	122.6	123.8	125.0	126.2	127.4	128.5	129.7	130.9	132.1
	H	2097.	2111.	2124.	2137.	2151.	2164.	2178.	2191.	2205.	2218.	2232.
	S	6.206	6.230	6.254	6.278	6.301	6.324	6.348	6.371	6.393	6.416	6.439
2400	V	110.0	111.1	112.2	113.3	114.4	115.5	116.6	117.7	118.8	119.9	120.9
	H	2095.	2108.	2122.	2135.	2148.	2162.	2175.	2189.	2202.	2216.	2230.
	S	6.160	6.184	6.208	6.232	6.255	6.279	6.302	6.325	6.348	6.371	6.393
2600	V	101.3	102.3	103.4	104.4	105.4	106.4	107.4	108.5	109.5	110.5	111.5
	H	2092.	2106.	2119.	2133.	2146.	2160.	2173.	2187.	2200.	2214.	2227.
	S	6.118	6.142	6.166	6.189	6.213	6.236	6.260	6.283	6.306	6.329	6.351
2800	V	93.89	94.85	95.80	96.76	97.71	98.67	99.62	100.6	101.5	102.5	103.4
	H	2090.	2103.	2117.	2130.	2144.	2157.	2171.	2184.	2198.	2212.	2225.
	S	6.078	6.102	6.126	6.150	6.174	6.197	6.220	6.244	6.267	6.289	6.312
3000	V	87.45	88.35	89.25	90.15	91.05	91.94	92.84	93.73	94.62	95.51	96.39
	H	2087.	2101.	2114.	2128.	2142.	2155.	2169.	2182.	2196.	2210.	2223.
	S	6.041	6.065	6.089	6.113	6.137	6.160	6.184	6.207	6.230	6.253	6.276
3200	V	81.82	82.67	83.52	84.37	85.21	86.06	86.90	87.74	88.58	89.42	90.25
	H	2085.	2099.	2112.	2126.	2139.	2153.	2166.	2180.	2194.	2207.	2221.
	S	6.006	6.030	6.054	6.078	6.102	6.125	6.149	6.172	6.195	6.218	6.241
3400	V	76.85	77.66	78.46	79.27	80.07	80.87	81.66	82.46	83.25	84.04	84.84
	H	2082.	2096.	2110.	2123.	2137.	2151.	2164.	2178.	2192.	2205.	2219.
	S	5.972	5.997	6.021	6.045	6.069	6.093	6.116	6.140	6.163	6.186	6.209

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
3600	V	72.44	73.20	73.97	74.73	75.49	76.25	77.01	77.76	78.52	79.27	80.02
	H	2080.	2094.	2107.	2121.	2135.	2148.	2162.	2176.	2189.	2203.	2217.
	S	5.941	5.965	5.990	6.014	6.038	6.062	6.085	6.109	6.132	6.155	6.178
3800	V	68.48	69.22	69.94	70.67	71.40	72.12	72.84	73.56	74.28	74.99	75.71
	H	2077.	2091.	2105.	2119.	2132.	2146.	2160.	2173.	2187.	2201.	2215.
	S	5.911	5.935	5.960	5.984	6.008	6.032	6.056	6.079	6.102	6.126	6.149
4000	V	64.93	65.63	66.32	67.02	67.71	68.40	69.09	69.78	70.46	71.15	71.83
	H	2075.	2089.	2102.	2116.	2130.	2144.	2157.	2171.	2185.	2199.	2213.
	S	5.882	5.907	5.931	5.956	5.980	6.004	6.027	6.051	6.074	6.098	6.121
4200	V	61.71	62.38	63.04	63.71	64.37	65.04	65.70	66.35	67.01	67.67	68.32
	H	2073.	2086.	2100.	2114.	2128.	2141.	2155.	2169.	2183.	2197.	2211.
	S	5.855	5.880	5.904	5.929	5.953	5.977	6.001	6.024	6.048	6.071	6.094
4400	V	58.78	59.42	60.07	60.70	61.34	61.98	62.61	63.24	63.87	64.50	65.13
	H	2070.	2084.	2098.	2111.	2125.	2139.	2153.	2167.	2181.	2195.	2209.
	S	5.829	5.853	5.878	5.903	5.927	5.951	5.975	5.998	6.022	6.045	6.068
4600	V	56.11	56.73	57.34	57.96	58.57	59.18	59.79	60.40	61.01	61.61	62.21
	H	2068.	2081.	2095.	2109.	2123.	2137.	2151.	2165.	2179.	2193.	2207.
	S	5.803	5.828	5.853	5.877	5.902	5.926	5.950	5.974	5.997	6.021	6.044
4800	V	53.66	54.25	54.85	55.44	56.03	56.62	57.21	57.80	58.38	58.96	59.54
	H	2065.	2079.	2093.	2107.	2121.	2135.	2149.	2162.	2176.	2190.	2204.
	S	5.779	5.804	5.829	5.853	5.878	5.902	5.926	5.950	5.973	5.997	6.020
5000	V	51.40	51.98	52.55	53.13	53.70	54.27	54.83	55.40	55.96	56.52	57.08
	H	2063.	2076.	2090.	2104.	2118.	2132.	2146.	2160.	2174.	2188.	2202.
	S	5.755	5.781	5.805	5.830	5.855	5.879	5.903	5.927	5.951	5.974	5.997
5200	V	49.32	49.88	50.44	50.99	51.54	52.09	52.64	53.18	53.73	54.27	54.81
	H	2060.	2074.	2088.	2102.	2116.	2130.	2144.	2158.	2172.	2186.	2200.
	S	5.733	5.758	5.783	5.808	5.832	5.857	5.881	5.905	5.928	5.952	5.975
5400	V	47.39	47.93	48.47	49.01	49.54	50.08	50.61	51.13	51.66	52.19	52.71
	H	2058.	2072.	2086.	2100.	2114.	2128.	2142.	2156.	2170.	2184.	2198.
	S	5.711	5.736	5.761	5.786	5.811	5.835	5.859	5.883	5.907	5.931	5.954
5600	V	45.60	46.13	46.65	47.17	47.69	48.20	48.72	49.23	49.74	50.25	50.76
	H	2055.	2069.	2083.	2097.	2111.	2125.	2140.	2154.	2168.	2182.	2196.
	S	5.689	5.715	5.740	5.765	5.790	5.814	5.838	5.862	5.886	5.910	5.934
5800	V	43.94	44.45	44.95	45.46	45.96	46.46	46.96	47.46	47.95	48.45	48.94
	H	2053.	2067.	2081.	2095.	2109.	2123.	2137.	2151.	2166.	2180.	2194.
	S	5.669	5.694	5.719	5.744	5.769	5.794	5.818	5.842	5.866	5.890	5.914
6000	V	42.38	42.88	43.37	43.86	44.35	44.84	45.32	45.80	46.29	46.77	47.24
	H	2050.	2064.	2078.	2093.	2107.	2121.	2135.	2149.	2163.	2178.	2192.
	S	5.649	5.674	5.699	5.724	5.749	5.774	5.798	5.823	5.847	5.870	5.894

Table 10 (Continued)
Temperature range: 280 to 330°C

F	T	280	285	290	295	300	305	310	315	320	325	330
6200	V	40.92	41.41	41.89	42.36	42.84	43.31	43.79	44.26	44.72	45.19	45.66
	H	2048.	2062.	2076.	2090.	2104.	2119.	2133.	2147.	2161.	2176.	2190.
	S	5.629	5.655	5.680	5.705	5.730	5.755	5.779	5.804	5.828	5.852	5.875
6400	V	39.56	40.03	40.50	40.96	41.42	41.89	42.35	42.80	43.26	43.72	44.17
	H	2045.	2059.	2074.	2088.	2102.	2116.	2131.	2145.	2159.	2173.	2188.
	S	5.610	5.636	5.661	5.686	5.711	5.736	5.761	5.785	5.809	5.833	5.857
6600	V	38.28	38.73	39.19	39.64	40.10	40.55	40.99	41.44	41.88	42.33	42.77
	H	2042.	2057.	2071.	2085.	2100.	2114.	2128.	2143.	2157.	2171.	2186.
	S	5.591	5.617	5.643	5.668	5.693	5.718	5.743	5.767	5.791	5.815	5.839
6800	V	37.07	37.52	37.96	38.40	38.84	39.28	39.72	40.16	40.59	41.02	41.45
	H	2040.	2054.	2069.	2083.	2097.	2112.	2126.	2141.	2155.	2169.	2184.
	S	5.573	5.599	5.625	5.650	5.675	5.700	5.725	5.749	5.774	5.798	5.822
7000	V	35.93	36.37	36.80	37.23	37.66	38.09	38.52	38.95	39.37	39.79	40.21
	H	2037.	2052.	2066.	2081.	2095.	2110.	2124.	2138.	2153.	2167.	2181.
	S	5.555	5.581	5.607	5.633	5.658	5.683	5.708	5.732	5.757	5.781	5.805
7200	V	34.85	35.28	35.71	36.13	36.55	36.97	37.39	37.80	38.22	38.63	39.04
	H	2035.	2049.	2064.	2078.	2093.	2107.	2122.	2136.	2151.	2165.	2179.
	S	5.538	5.564	5.590	5.616	5.641	5.666	5.691	5.715	5.740	5.764	5.788
7400	V	33.84	34.25	34.67	35.08	35.50	35.90	36.31	36.72	37.12	37.53	37.93
	H	2032.	2047.	2062.	2076.	2091.	2105.	2119.	2134.	2148.	2163.	2177.
	S	5.521	5.547	5.573	5.599	5.624	5.649	5.674	5.699	5.724	5.748	5.772
7600	V	32.87	33.28	33.69	34.09	34.50	34.90	35.30	35.69	36.09	36.48	36.88
	H	2030.	2045.	2059.	2074.	2088.	2103.	2117.	2132.	2146.	2161.	2175.
	S	5.505	5.531	5.557	5.583	5.608	5.633	5.658	5.683	5.708	5.732	5.756
7800	V	31.96	32.36	32.76	33.15	33.55	33.94	34.33	34.72	35.11	35.49	35.88
	H	2027.	2042.	2057.	2071.	2086.	2100.	2115.	2130.	2144.	2159.	2173.
	S	5.488	5.515	5.541	5.567	5.592	5.617	5.642	5.667	5.692	5.716	5.741
8000	V	31.09	31.48	31.87	32.26	32.65	33.03	33.41	33.80	34.18	34.55	34.93
	H	2025.	2040.	2054.	2069.	2084.	2098.	2113.	2127.	2142.	2157.	2171.
	S	5.472	5.499	5.525	5.551	5.577	5.602	5.627	5.652	5.677	5.701	5.725
8200	V	30.26	30.64	31.03	31.41	31.79	32.17	32.54	32.92	33.29	33.66	34.03
	H	2022.	2037.	2052.	2067.	2081.	2096.	2111.	2125.	2140.	2154.	2169.
	S	5.457	5.483	5.510	5.535	5.561	5.587	5.612	5.637	5.662	5.686	5.710
8400	V	29.47	29.85	30.23	30.60	30.97	31.34	31.71	32.08	32.44	32.81	33.17
	H	2020.	2035.	2049.	2064.	2079.	2094.	2108.	2123.	2138.	2152.	2167.
	S	5.441	5.468	5.494	5.520	5.546	5.572	5.597	5.622	5.647	5.672	5.696
8600	V	28.72	29.09	29.46	29.83	30.19	30.56	30.92	31.28	31.64	31.99	32.35
	H	2017.	2032.	2047.	2062.	2077.	2091.	2106.	2121.	2135.	2150.	2165.
	S	5.426	5.453	5.479	5.506	5.532	5.557	5.582	5.608	5.632	5.657	5.682

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
8800	V	28.00	28.37	28.73	29.09	29.45	29.81	30.16	30.52	30.87	31.22	31.57
	H	2015.	2030.	2045.	2059.	2074.	2089.	2104.	2119.	2133.	2148.	2163.
	S	5.411	5.438	5.465	5.491	5.517	5.543	5.568	5.593	5.618	5.643	5.668
9000	V	27.31	27.67	28.03	28.39	28.74	29.09	29.44	29.79	30.13	30.48	30.82
	H	2012.	2027.	2042.	2057.	2072.	2087.	2102.	2116.	2131.	2146.	2161.
	S	5.397	5.424	5.450	5.477	5.503	5.529	5.554	5.579	5.604	5.629	5.654
9200	V	26.66	27.01	27.36	27.71	28.06	28.40	28.75	29.09	29.43	29.77	30.10
	H	2010.	2025.	2040.	2055.	2070.	2085.	2099.	2114.	2129.	2144.	2159.
	S	5.383	5.410	5.436	5.463	5.489	5.515	5.540	5.566	5.591	5.616	5.640
9400	V	26.03	26.38	26.72	27.07	27.41	27.75	28.09	28.42	28.75	29.09	29.42
	H	2007.	2022.	2037.	2052.	2067.	2082.	2097.	2112.	2127.	2142.	2157.
	S	5.368	5.396	5.422	5.449	5.475	5.501	5.527	5.552	5.577	5.602	5.627
9600	V	25.43	25.77	26.11	26.45	26.78	27.12	27.45	27.78	28.11	28.44	28.76
	H	2005.	2020.	2035.	2050.	2065.	2080.	2095.	2110.	2125.	2140.	2154.
	S	5.355	5.382	5.409	5.435	5.462	5.488	5.513	5.539	5.564	5.589	5.614
9800	V	24.85	25.19	25.52	25.86	26.19	26.51	26.84	27.17	27.49	27.81	28.13
	H	2002.	2017.	2033.	2048.	2063.	2078.	2093.	2108.	2123.	2138.	2152.
	S	5.341	5.368	5.395	5.422	5.448	5.474	5.500	5.526	5.551	5.576	5.601
10000	V	24.29	24.63	24.96	25.29	25.61	25.93	26.26	26.58	26.89	27.21	27.53
	H	2000.	2015.	2030.	2045.	2060.	2075.	2090.	2105.	2120.	2135.	2150.
	S	5.328	5.355	5.382	5.409	5.435	5.461	5.487	5.513	5.538	5.563	5.588
10100	V	24.02	24.36	24.68	25.01	25.33	25.65	25.97	26.29	26.61	26.92	27.23
	H	1998.	2014.	2029.	2044.	2059.	2074.	2089.	2104.	2119.	2134.	2149.
	S	5.321	5.348	5.375	5.402	5.429	5.455	5.481	5.507	5.532	5.557	5.582
10200	V	23.76	24.09	24.41	24.74	25.06	25.38	25.69	26.01	26.32	26.63	26.94
	H	1997.	2012.	2028.	2043.	2058.	2073.	2088.	2103.	2118.	2133.	2148.
	S	5.314	5.342	5.369	5.396	5.422	5.449	5.475	5.500	5.526	5.551	5.576
10300	V	23.50	23.83	24.15	24.47	24.79	25.11	25.42	25.73	26.04	26.35	26.66
	H	1996.	2011.	2026.	2042.	2057.	2072.	2087.	2102.	2117.	2132.	2147.
	S	5.308	5.335	5.363	5.389	5.416	5.442	5.468	5.494	5.520	5.545	5.570
10400	V	23.25	23.57	23.89	24.21	24.53	24.84	25.15	25.46	25.77	26.08	26.38
	H	1995.	2010.	2025.	2041.	2056.	2071.	2086.	2101.	2116.	2131.	2146.
	S	5.301	5.329	5.356	5.383	5.410	5.436	5.462	5.488	5.513	5.539	5.564
10500	V	23.00	23.32	23.64	23.95	24.27	24.58	24.89	25.20	25.51	25.81	26.11
	H	1993.	2009.	2024.	2039.	2055.	2070.	2085.	2100.	2115.	2130.	2145.
	S	5.295	5.322	5.350	5.377	5.403	5.430	5.456	5.482	5.507	5.532	5.558
10600	V	22.75	23.07	23.39	23.70	24.02	24.33	24.63	24.94	25.24	25.55	25.85
	H	1992.	2007.	2023.	2038.	2053.	2069.	2084.	2099.	2114.	2129.	2144.
	S	5.288	5.316	5.343	5.370	5.397	5.424	5.450	5.476	5.501	5.526	5.551

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
10700	V	22.51	22.83	23.15	23.46	23.77	24.07	24.38	24.68	24.99	25.29	25.58
	H	1991.	2006.	2022.	2037.	2052.	2067.	2083.	2098.	2113.	2128.	2143.
	S	5.282	5.310	5.337	5.364	5.391	5.417	5.444	5.469	5.495	5.520	5.546
10800	V	22.28	22.59	22.91	23.22	23.52	23.83	24.13	24.43	24.73	25.03	25.33
	H	1990.	2005.	2020.	2036.	2051.	2066.	2082.	2097.	2112.	2127.	2142.
	S	5.276	5.303	5.331	5.358	5.385	5.411	5.438	5.463	5.489	5.514	5.540
10900	V	22.05	22.36	22.67	22.98	23.28	23.59	23.89	24.19	24.49	24.78	25.08
	H	1988.	2004.	2019.	2035.	2050.	2065.	2080.	2096.	2111.	2126.	2141.
	S	5.269	5.297	5.325	5.352	5.379	5.405	5.431	5.457	5.483	5.509	5.534
11000	V	21.82	22.13	22.44	22.74	23.05	23.35	23.65	23.95	24.24	24.54	24.83
	H	1987.	2003.	2018.	2033.	2049.	2064.	2079.	2095.	2110.	2125.	2140.
	S	5.263	5.291	5.319	5.346	5.373	5.399	5.426	5.451	5.477	5.503	5.528
11100	V	21.60	21.91	22.21	22.52	22.82	23.12	23.41	23.71	24.00	24.29	24.59
	H	1986.	2001.	2017.	2032.	2048.	2063.	2078.	2093.	2109.	2124.	2139.
	S	5.257	5.285	5.312	5.340	5.367	5.393	5.420	5.446	5.471	5.497	5.522
11200	V	21.38	21.68	21.99	22.29	22.59	22.89	23.18	23.48	23.77	24.06	24.35
	H	1984.	2000.	2016.	2031.	2046.	2062.	2077.	2092.	2108.	2123.	2138.
	S	5.251	5.279	5.306	5.334	5.361	5.387	5.414	5.440	5.465	5.491	5.516
11300	V	21.16	21.47	21.77	22.07	22.37	22.66	22.96	23.25	23.54	23.83	24.11
	H	1983.	1999.	2014.	2030.	2045.	2061.	2076.	2091.	2106.	2122.	2137.
	S	5.244	5.273	5.300	5.328	5.355	5.381	5.408	5.434	5.460	5.485	5.511
11400	V	20.95	21.25	21.55	21.85	22.15	22.44	22.73	23.02	23.31	23.60	23.88
	H	1982.	1998.	2013.	2029.	2044.	2059.	2075.	2090.	2105.	2121.	2136.
	S	5.238	5.266	5.294	5.322	5.349	5.376	5.402	5.428	5.454	5.480	5.505
11500	V	20.74	21.04	21.34	21.64	21.93	22.22	22.51	22.80	23.09	23.37	23.65
	H	1981.	1996.	2012.	2027.	2043.	2058.	2074.	2089.	2104.	2120.	2135.
	S	5.232	5.260	5.288	5.316	5.343	5.370	5.396	5.422	5.448	5.474	5.499
11600	V	20.54	20.84	21.14	21.43	21.72	22.01	22.30	22.59	22.87	23.15	23.43
	H	1979.	1995.	2011.	2026.	2042.	2057.	2073.	2088.	2103.	2119.	2134.
	S	5.226	5.255	5.282	5.310	5.337	5.364	5.390	5.417	5.443	5.468	5.494
11700	V	20.34	20.64	20.93	21.22	21.51	21.80	22.09	22.37	22.65	22.93	23.21
	H	1978.	1994.	2009.	2025.	2041.	2056.	2072.	2087.	2102.	2118.	2133.
	S	5.220	5.249	5.276	5.304	5.331	5.358	5.385	5.411	5.437	5.463	5.488
11800	V	20.14	20.44	20.73	21.02	21.31	21.60	21.88	22.16	22.44	22.72	23.00
	H	1977.	1993.	2008.	2024.	2039.	2055.	2070.	2086.	2101.	2116.	2132.
	S	5.214	5.243	5.271	5.298	5.325	5.352	5.379	5.405	5.431	5.457	5.482
11900	V	19.95	20.24	20.53	20.82	21.11	21.39	21.68	21.96	22.23	22.51	22.79
	H	1976.	1991.	2007.	2023.	2038.	2054.	2069.	2085.	2100.	2115.	2131.
	S	5.208	5.237	5.265	5.292	5.320	5.347	5.373	5.400	5.426	5.451	5.477

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
12000	V	19.76	20.05	20.34	20.63	20.91	21.19	21.47	21.75	22.03	22.30	22.58
	H	1974.	1990.	2006.	2022.	2037.	2053.	2068.	2084.	2099.	2114.	2130.
	S	5.202	5.231	5.259	5.287	5.314	5.341	5.368	5.394	5.420	5.446	5.471
12200	V	19.38	19.67	19.96	20.24	20.52	20.80	21.08	21.36	21.63	21.90	22.17
	H	1972.	1988.	2003.	2019.	2035.	2050.	2066.	2081.	2097.	2112.	2128.
	S	5.191	5.219	5.248	5.275	5.303	5.330	5.357	5.383	5.409	5.435	5.461
12400	V	19.02	19.31	19.59	19.87	20.15	20.43	20.70	20.97	21.24	21.51	21.78
	H	1969.	1985.	2001.	2017.	2032.	2048.	2064.	2079.	2095.	2110.	2126.
	S	5.179	5.208	5.236	5.264	5.292	5.319	5.346	5.372	5.398	5.424	5.450
12600	V	18.67	18.96	19.24	19.51	19.79	20.06	20.33	20.60	20.87	21.14	21.40
	H	1967.	1983.	1999.	2014.	2030.	2046.	2061.	2077.	2093.	2108.	2123.
	S	5.168	5.197	5.225	5.253	5.281	5.308	5.335	5.361	5.388	5.414	5.439
12800	V	18.34	18.62	18.89	19.17	19.44	19.71	19.98	20.24	20.51	20.77	21.03
	H	1964.	1980.	1996.	2012.	2028.	2044.	2059.	2075.	2090.	2106.	2121.
	S	5.157	5.185	5.214	5.242	5.270	5.297	5.324	5.351	5.377	5.403	5.429
13000	V	18.01	18.28	18.56	18.83	19.10	19.37	19.63	19.89	20.16	20.42	20.67
	H	1962.	1978.	1994.	2010.	2025.	2041.	2057.	2073.	2088.	2104.	2119.
	S	5.145	5.174	5.203	5.231	5.259	5.286	5.313	5.340	5.367	5.393	5.419
13200	V	17.69	17.96	18.24	18.50	18.77	19.03	19.30	19.56	19.82	20.07	20.33
	H	1959.	1975.	1991.	2007.	2023.	2039.	2055.	2070.	2086.	2102.	2117.
	S	5.134	5.163	5.192	5.220	5.248	5.276	5.303	5.330	5.356	5.382	5.408
13400	V	17.38	17.65	17.92	18.19	18.45	18.71	18.97	19.23	19.48	19.74	19.99
	H	1956.	1973.	1989.	2005.	2021.	2037.	2053.	2068.	2084.	2100.	2115.
	S	5.123	5.153	5.181	5.210	5.238	5.265	5.293	5.319	5.346	5.372	5.398
13600	V	17.08	17.35	17.62	17.88	18.14	18.40	18.66	18.91	19.16	19.41	19.66
	H	1954.	1970.	1986.	2002.	2019.	2034.	2050.	2066.	2082.	2098.	2113.
	S	5.112	5.142	5.171	5.199	5.227	5.255	5.282	5.309	5.336	5.362	5.388
13800	V	16.79	17.06	17.32	17.58	17.84	18.10	18.35	18.60	18.85	19.10	19.35
	H	1951.	1968.	1984.	2000.	2016.	2032.	2048.	2064.	2080.	2095.	2111.
	S	5.102	5.131	5.160	5.189	5.217	5.245	5.272	5.299	5.326	5.352	5.378
14000	V	16.51	16.77	17.03	17.29	17.55	17.80	18.05	18.30	18.55	18.79	19.04
	H	1949.	1965.	1982.	1998.	2014.	2030.	2046.	2062.	2078.	2093.	2109.
	S	5.091	5.121	5.150	5.178	5.207	5.235	5.262	5.289	5.316	5.342	5.369
14200	V	16.23	16.50	16.75	17.01	17.26	17.51	17.76	18.01	18.25	18.50	18.74
	H	1946.	1963.	1979.	1995.	2012.	2028.	2044.	2060.	2075.	2091.	2107.
	S	5.080	5.110	5.139	5.168	5.197	5.225	5.252	5.279	5.306	5.333	5.359
14400	V	15.97	16.23	16.48	16.74	16.99	17.23	17.48	17.73	17.97	18.21	18.45
	H	1944.	1960.	1977.	1993.	2009.	2025.	2041.	2057.	2073.	2089.	2105.
	S	5.070	5.100	5.129	5.158	5.187	5.215	5.242	5.270	5.296	5.323	5.349

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
14600	V	15.71	15.96	16.22	16.47	16.72	16.96	17.21	17.45	17.69	17.93	18.16
	H	1941.	1958.	1974.	1991.	2007.	2023.	2039.	2055.	2071.	2087.	2103.
	S	5.060	5.090	5.119	5.148	5.177	5.205	5.232	5.260	5.287	5.314	5.340
14800	V	15.45	15.71	15.96	16.21	16.46	16.70	16.94	17.18	17.42	17.65	17.89
	H	1938.	1955.	1972.	1988.	2005.	2021.	2037.	2053.	2069.	2085.	2101.
	S	5.049	5.079	5.109	5.138	5.167	5.195	5.223	5.250	5.277	5.304	5.330
15000	V	15.21	15.46	15.71	15.96	16.20	16.44	16.68	16.92	17.15	17.39	17.62
	H	1936.	1953.	1969.	1986.	2002.	2019.	2035.	2051.	2067.	2083.	2099.
	S	5.039	5.069	5.099	5.128	5.157	5.185	5.213	5.241	5.268	5.295	5.321
16000	V	14.07	14.31	14.55	14.79	15.02	15.25	15.48	15.71	15.93	16.16	16.38
	H	1923.	1940.	1957.	1974.	1991.	2007.	2024.	2040.	2056.	2072.	2089.
	S	4.990	5.020	5.051	5.080	5.109	5.138	5.167	5.194	5.222	5.249	5.276
17000	V	13.07	13.30	13.53	13.76	13.98	14.21	14.43	14.64	14.86	15.07	15.28
	H	1910.	1928.	1945.	1962.	1979.	1996.	2012.	2029.	2046.	2062.	2078.
	S	4.942	4.973	5.004	5.034	5.064	5.093	5.122	5.150	5.178	5.206	5.233
18000	V	12.18	12.40	12.63	12.84	13.06	13.27	13.49	13.70	13.90	14.11	14.31
	H	1897.	1915.	1933.	1950.	1967.	1984.	2001.	2018.	2035.	2052.	2068.
	S	4.896	4.928	4.959	4.990	5.020	5.050	5.079	5.108	5.136	5.164	5.191
19000	V	11.38	11.60	11.82	12.03	12.24	12.44	12.65	12.85	13.05	13.25	13.44
	H	1885.	1903.	1921.	1938.	1956.	1973.	1990.	2007.	2024.	2041.	2058.
	S	4.851	4.884	4.916	4.947	4.978	5.008	5.038	5.067	5.095	5.124	5.152
20000	V	10.67	10.88	11.09	11.29	11.50	11.70	11.89	12.09	12.28	12.47	12.66
	H	1872.	1890.	1908.	1926.	1944.	1962.	1979.	1997.	2014.	2031.	2048.
	S	4.808	4.841	4.874	4.906	4.937	4.968	4.998	5.027	5.056	5.085	5.113
21000	V	10.03	10.23	10.44	10.63	10.83	11.02	11.21	11.40	11.59	11.77	11.96
	H	1859.	1878.	1896.	1915.	1933.	1951.	1968.	1986.	2003.	2021.	2038.
	S	4.766	4.800	4.833	4.866	4.898	4.929	4.959	4.989	5.019	5.048	5.076
22000	V	9.450	9.649	9.844	10.04	10.23	10.41	10.60	10.78	10.96	11.14	11.32
	H	1846.	1865.	1884.	1903.	1921.	1940.	1958.	1975.	1993.	2011.	2028.
	S	4.726	4.760	4.794	4.827	4.859	4.891	4.922	4.952	4.982	5.012	5.040
23000	V	8.926	9.118	9.307	9.494	9.678	9.859	10.04	10.22	10.39	10.56	10.73
	H	1834.	1853.	1872.	1891.	1910.	1929.	1947.	1965.	1983.	2000.	2018.
	S	4.686	4.722	4.756	4.789	4.822	4.854	4.886	4.917	4.947	4.977	5.006
24000	V	8.449	8.636	8.820	9.001	9.179	9.355	9.529	9.701	9.870	10.04	10.20
	H	1821.	1841.	1861.	1880.	1899.	1918.	1936.	1954.	1973.	1990.	2008.
	S	4.648	4.684	4.719	4.753	4.786	4.819	4.851	4.882	4.913	4.943	4.972
25000	V	8.016	8.198	8.376	8.552	8.725	8.896	9.064	9.231	9.395	9.558	9.719
	H	1809.	1829.	1849.	1869.	1888.	1907.	1926.	1944.	1962.	1981.	1999.
	S	4.611	4.647	4.683	4.718	4.751	4.784	4.817	4.848	4.879	4.910	4.940

Table 10 (Continued)
Temperature range: 280 to 330°C

P	T	280	285	290	295	300	305	310	315	320	325	330
26000	V	7.622	7.798	7.971	8.142	8.310	8.475	8.639	8.801	8.960	9.118	9.274
	H	1797.	1817.	1837.	1857.	1877.	1896.	1915.	1934.	1952.	1971.	1989.
	S	4.575	4.612	4.648	4.683	4.717	4.751	4.784	4.816	4.847	4.878	4.908
28000	V	6.935	7.101	7.263	7.424	7.582	7.738	7.892	8.044	8.194	8.343	8.490
	H	1773.	1794.	1815.	1836.	1856.	1875.	1895.	1914.	1933.	1952.	1970.
	S	4.506	4.544	4.581	4.617	4.653	4.687	4.720	4.753	4.785	4.817	4.848
30000	V	6.362	6.518	6.670	6.821	6.970	7.116	7.261	7.404	7.546	7.686	7.825
	H	1751.	1772.	1794.	1815.	1835.	1855.	1875.	1895.	1914.	1933.	1952.
	S	4.442	4.481	4.519	4.556	4.592	4.627	4.661	4.695	4.727	4.759	4.791
32000	V	5.882	6.028	6.171	6.312	6.452	6.590	6.726	6.861	6.994	7.126	7.257
	H	1729.	1752.	1774.	1795.	1816.	1836.	1857.	1877.	1896.	1916.	1935.
	S	4.381	4.421	4.460	4.498	4.535	4.570	4.605	4.639	4.673	4.705	4.737
34000	V	5.478	5.614	5.748	5.881	6.012	6.142	6.270	6.397	6.522	6.646	6.769
	H	1709.	1732.	1754.	1776.	1798.	1818.	1839.	1859.	1879.	1899.	1919.
	S	4.324	4.365	4.405	4.443	4.481	4.517	4.553	4.587	4.621	4.654	4.687
36000	V	5.134	5.262	5.388	5.513	5.636	5.758	5.879	5.998	6.116	6.233	6.349
	H	1651.	1714.	1736.	1758.	1780.	1801.	1822.	1843.	1863.	1883.	1903.
	S	4.271	4.313	4.353	4.392	4.430	4.467	4.503	4.538	4.573	4.606	4.639
38000	V	4.840	4.960	5.079	5.197	5.313	5.428	5.541	5.654	5.765	5.876	5.985
	H	1673.	1697.	1719.	1742.	1764.	1785.	1807.	1828.	1848.	1868.	1888.
	S	4.221	4.264	4.304	4.344	4.383	4.420	4.457	4.492	4.527	4.561	4.594
40000	V	4.587	4.700	4.812	4.922	5.032	5.141	5.248	5.354	5.460	5.564	5.668
	H	1657.	1680.	1703.	1726.	1748.	1770.	1792.	1813.	1834.	1854.	1874.
	S	4.175	4.217	4.259	4.299	4.338	4.376	4.413	4.449	4.484	4.518	4.552
42000	V	4.366	4.472	4.578	4.683	4.787	4.889	4.991	5.092	5.192	5.291	5.390
	H	1641.	1665.	1688.	1711.	1734.	1756.	1778.	1799.	1820.	1841.	1861.
	S	4.130	4.174	4.215	4.256	4.295	4.334	4.371	4.407	4.443	4.478	4.512
44000	V	4.172	4.273	4.373	4.472	4.571	4.668	4.765	4.861	4.956	5.050	5.144
	H	1627.	1651.	1674.	1697.	1720.	1742.	1764.	1786.	1807.	1828.	1849.
	S	4.089	4.132	4.174	4.215	4.255	4.294	4.331	4.368	4.404	4.439	4.474
46000	V	4.001	4.096	4.191	4.286	4.379	4.472	4.564	4.655	4.746	4.836	4.925
	H	1613.	1637.	1661.	1684.	1707.	1730.	1752.	1774.	1795.	1816.	1837.
	S	4.050	4.093	4.135	4.177	4.217	4.256	4.294	4.331	4.367	4.403	4.437
48000	V	3.850	3.940	4.030	4.119	4.208	4.297	4.385	4.472	4.558	4.644	4.729
	H	1600.	1625.	1649.	1672.	1695.	1718.	1740.	1762.	1783.	1805.	1826.
	S	4.013	4.056	4.099	4.140	4.180	4.220	4.258	4.295	4.332	4.368	4.403
50000	V	3.716	3.801	3.886	3.971	4.055	4.140	4.223	4.307	4.390	4.472	4.553
	H	1589.	1613.	1637.	1660.	1683.	1706.	1729.	1751.	1772.	1794.	1815.
	S	3.578	4.021	4.064	4.105	4.146	4.185	4.224	4.262	4.298	4.334	4.370

Table 11. The saturation properties of isobutane

T	P	v_f	v_{fg}	v_g	h_f	h_{fg}	h_g	s_f	s_{fg}	s_g
-20	72.65	1.658	479.7	481.3	40.17	367.7	407.8	0.1650	1.452	1.617
-18	78.91	1.664	444.0	445.7	44.34	366.1	410.4	0.1813	1.435	1.616
-16	85.59	1.670	411.6	413.2	48.51	364.5	413.0	0.1975	1.418	1.615
-14	92.70	1.677	382.0	383.6	52.67	363.0	415.7	0.2136	1.401	1.614
-12	100.3	1.683	355.0	356.6	56.83	361.4	418.3	0.2296	1.384	1.614
✓ -11.73	101.3	1.684	351.3	353.0	57.55	361.1	418.6	0.2323	1.381	1.614
-10	108.3	1.690	330.0	331.7	61.25	359.6	420.9	0.2464	1.367	1.613
- 8	116.8	1.696	307.5	309.1	65.40	358.1	423.5	0.2621	1.351	1.613
- 6	125.9	1.703	286.5	288.2	69.81	356.3	426.2	0.2785	1.334	1.612
- 4	135.5	1.710	267.3	269.1	74.21	354.6	428.8	0.2949	1.317	1.612
- 2	145.6	1.716	249.8	251.5	78.48	353.0	431.4	0.3106	1.302	1.612
0	156.3	1.723	233.6	235.3	82.87	351.2	434.1	0.3267	1.286	1.613
2	167.7	1.730	218.7	220.4	87.26	349.5	436.7	0.3427	1.270	1.613
4	179.6	1.737	204.8	206.5	91.77	347.6	439.4	0.3589	1.254	1.613
6	192.2	1.745	192.1	193.8	96.15	345.9	442.1	0.3746	1.239	1.614
8	205.4	1.752	180.2	181.9	100.8	343.9	444.7	0.3910	1.223	1.614
10	219.3	1.759	169.3	171.1	105.1	342.2	447.4	0.4064	1.209	1.615
12	234.0	1.767	159.1	160.9	109.7	340.3	450.0	0.4225	1.193	1.616
14	249.4	1.774	149.7	151.5	114.4	338.4	452.7	0.4385	1.178	1.617
16	265.5	1.782	140.9	142.7	118.9	336.4	455.4	0.4543	1.163	1.618
18	282.4	1.789	132.8	134.6	123.5	334.5	458.0	0.4701	1.149	1.619
20	300.1	1.797	125.2	127.0	128.1	332.6	460.7	0.4857	1.135	1.620
22	318.7	1.805	118.1	119.9	133.0	330.4	463.4	0.5019	1.119	1.621
24	338.1	1.813	111.5	113.3	137.5	328.5	466.0	0.5173	1.106	1.623
26	358.3	1.822	105.3	107.1	142.3	326.4	468.7	0.5333	1.091	1.624
28	379.5	1.830	99.51	101.3	147.1	324.2	471.4	0.5491	1.077	1.626
30	401.6	1.838	94.11	95.94	151.9	322.1	474.0	0.5649	1.062	1.627

Table 11 (Continued)

T	P	v_f	v_{fg}	v_g	h_f	h_{fg}	h_g	s_f	s_{fg}	s_g
32	424.7	1.847	89.05	90.90	156.7	319.9	476.7	0.5805	1.048	1.629
34	448.8	1.856	84.32	86.18	161.5	317.8	479.3	0.5960	1.035	1.631
36	473.8	1.865	79.90	81.76	166.3	315.7	482.0	0.6114	1.021	1.633
38	499.9	1.874	75.69	77.56	171.3	313.3	484.6	0.6273	1.007	1.634
40	527.1	1.883	71.77	73.65	176.2	311.1	487.3	0.6428	0.9934	1.636
42	555.3	1.893	68.09	69.98	181.1	308.8	489.9	0.6582	0.9799	1.638
44	584.7	1.902	64.61	66.51	186.1	306.5	492.5	0.6738	0.9663	1.640
46	615.2	1.912	61.33	63.24	191.0	304.1	495.1	0.6893	0.9528	1.642
48	646.8	1.922	58.20	60.13	196.3	301.5	497.7	0.7054	0.9387	1.644
50	679.7	1.932	55.31	57.24	201.2	299.1	500.3	0.7207	0.9256	1.646
52	713.8	1.943	52.54	54.48	206.4	296.5	502.9	0.7365	0.9118	1.648
54	749.2	1.954	49.95	51.90	211.5	294.0	505.5	0.7519	0.8986	1.650
56	785.8	1.964	47.48	49.45	216.7	291.4	508.1	0.7675	0.8852	1.653
58	823.8	1.976	45.14	47.11	222.0	288.6	510.6	0.7833	0.8715	1.655
60	863.1	1.987	42.94	44.93	227.2	286.0	513.2	0.7987	0.8584	1.657
62	903.8	1.999	40.87	42.87	232.4	283.3	515.7	0.8139	0.8454	1.659
64	945.8	2.011	38.87	40.88	237.8	280.4	518.2	0.8297	0.8317	1.661
66	989.4	2.024	36.98	39.00	243.2	277.5	520.7	0.8454	0.8182	1.664
68	1034	2.036	35.19	37.23	248.6	274.6	523.1	0.8610	0.8049	1.666
70	1081	2.050	33.50	35.55	254.0	271.6	525.6	0.8765	0.7916	1.668
72	1129	2.063	31.87	33.93	259.6	268.4	528.0	0.8925	0.7777	1.670
74	1179	2.077	30.32	32.39	265.2	265.2	530.4	0.9084	0.7640	1.672
76	1230	2.092	28.85	30.94	270.8	262.0	532.8	0.9242	0.7503	1.675
78	1283	2.107	27.45	29.56	276.4	258.7	535.1	0.9399	0.7368	1.677
80	1337	2.122	26.13	28.25	282.0	255.5	537.4	0.9556	0.7233	1.679
82	1393	2.138	24.84	26.98	287.8	251.9	539.7	0.9717	0.7093	1.681
84	1451	2.155	23.62	25.78	293.6	248.3	542.0	0.9877	0.6953	1.683
86	1511	2.172	22.45	24.62	299.6	244.6	544.1	1.004	0.6810	1.685
88	1573	2.191	21.34	23.53	305.5	240.8	546.3	1.020	0.6667	1.688
90	1636	2.209	20.26	22.47	311.6	236.9	548.4	1.036	0.6522	1.688

Table 11 (Continued)

T	P	v_f	v_{fg}	v_g	h_f	h_{fg}	h_g	s_f	s_{fg}	s_g
92	1702	2.229	19.24	21.47	317.6	232.9	550.5	1.052	0.6378	1.690
94	1769	2.250	18.25	20.50	323.9	228.6	552.5	1.069	0.6226	1.692
96	1838	2.272	17.30	19.57	330.1	224.3	554.4	1.086	0.6076	1.693
98	1909	2.295	16.37	18.67	336.6	219.6	556.2	1.103	0.5918	1.695
100	1983	2.319	15.49	17.81	343.1	214.9	558.0	1.120	0.5760	1.696
102	2058	2.345	14.65	16.99	349.6	210.2	559.8	1.137	0.5603	1.697
104	2136	2.372	13.83	16.20	356.3	205.1	561.4	1.154	0.5438	1.698
106	2216	2.401	13.04	15.44	363.0	199.9	562.9	1.171	0.5273	1.699
108	2298	2.432	12.25	14.69	370.1	194.1	564.2	1.189	0.5093	1.699
110	2382	2.466	11.52	13.98	377.1	188.5	565.6	1.207	0.4919	1.699
112	2469	2.503	10.78	13.28	384.4	182.2	566.6	1.226	0.4731	1.699
114	2558	2.542	10.05	12.60	392.0	175.5	567.5	1.245	0.4534	1.698
116	2649	2.586	9.359	11.94	399.6	168.7	568.3	1.264	0.4335	1.697
118	2743	2.635	8.660	11.29	407.6	161.2	568.7	1.284	0.4120	1.696
120	2839	2.689	7.972	10.66	415.8	153.1	568.9	1.304	0.3895	1.693
122	2938	2.751	7.293	10.04	424.3	144.6	568.8	1.325	0.3658	1.690
124	3040	2.823	6.594	9.418	433.3	134.8	568.2	1.347	0.3395	1.686
126	3144	2.909	5.861	8.769	443.1	123.6	566.7	1.371	0.3097	1.680
128	3252	3.013	5.114	8.127	453.4	111.3	564.6	1.395	0.2774	1.673
130	3362	3.149	4.295	7.444	464.8	96.37	561.2	1.423	0.2390	1.662
132	3474	3.343	3.334	6.677	478.1	77.14	555.3	1.455	0.1904	1.646
134	3590	3.698	1.977	5.675	496.0	47.17	543.1	1.498	0.1159	1.614
135	3648	4.522	0.0	4.522	520.0	0.0	520.0	1.556	0.0	1.556

Table 12. Thermodynamic properties of isobutane in the superheated vapor state
Temperature range: -40 to 60°C

P	T	-40	-30	-20	-10	0	10	20	30	40	50	60
5	V	6650.	6940.	7230.	7510.	7800.	8090.	8380.	8660.	8950.	9240.	9520.
	H	384.0	397.6	411.7	426.3	441.5	457.2	473.3	490.0	507.2	524.9	543.1
	S	1.897	1.954	2.011	2.067	2.124	2.180	2.237	2.293	2.348	2.404	2.459
50	V			707.4	737.5	767.4	797.2	826.8	856.3	885.8	915.1	944.4
	H			409.2	424.0	439.4	455.2	471.6	488.4	505.7	523.5	541.7
	S			1.674	1.732	1.789	1.846	1.903	1.959	2.016	2.071	2.127
100	V				360.7	376.4	391.9	407.3	422.5	437.7	452.7	467.7
	H				421.4	436.9	453.0	469.5	486.5	504.0	521.9	540.2
	S				1.626	1.684	1.742	1.799	1.856	1.913	1.969	2.025
101.33	V				355.8	371.3	386.6	401.8	416.9	431.8	446.7	461.5
	H				421.3	436.9	452.9	469.5	486.4	503.9	521.8	540.2
	S				1.624	1.682	1.740	1.797	1.854	1.911	1.967	2.023
200	V						189.0	197.3	205.5	213.5	221.4	229.3
	H						448.3	465.3	482.6	500.4	518.6	537.2
	S						1.631	1.689	1.748	1.805	1.862	1.919
300	V							127.0	132.9	138.6	144.2	149.7
	H							460.7	478.5	496.6	515.1	534.0
	S							1.620	1.680	1.739	1.797	1.854
400	V								96.42	101.0	105.5	109.8
	H								474.1	492.6	511.5	530.7
	S								1.628	1.688	1.748	1.806
500	V									78.33	82.15	85.83
	H									488.4	507.7	527.3
	S									1.647	1.707	1.767
600	V										66.49	69.76
	H										503.7	523.6
	S										1.672	1.733
700	V											58.20
	H											519.9
	S											1.702
800	V											49.45
	H											515.8
	S											1.674
900	V											
	H											
	S											
1000	V											
	H											
	S											

Table 12 (Continued)
Temperature range: 70 to 170°C

P	T	70	80	90	100	110	120	130	140	150	160	170
5	V	98 10.	10100.	10380.	10670.	10960.	11240.	11530.	11820.	12100.	12390.	12670.
	H	561.7	580.8	600.4	620.4	640.9	661.9	683.3	705.1	727.4	750.1	773.2
	S	2.514	2.569	2.624	2.678	2.733	2.787	2.840	2.894	2.947	3.000	3.053
50	V	973.6	1000.	1030.	1060.	1090.	1120.	1150.	1180.	1210.	1230.	1260.
	H	560.5	579.7	599.3	619.4	640.0	661.0	682.4	704.3	726.6	749.3	772.5
	S	2.182	2.238	2.293	2.347	2.402	2.456	2.509	2.563	2.616	2.669	2.722
100	V	482.6	497.5	512.3	527.1	541.8	556.5	571.1	585.7	600.3	614.9	629.5
	H	559.1	578.4	598.1	618.3	638.9	660.0	681.5	703.4	725.8	748.5	771.7
	S	2.081	2.136	2.191	2.246	2.300	2.355	2.409	2.462	2.516	2.569	2.622
101.33	V	476.2	490.9	505.5	520.0	534.6	549.1	563.5	578.0	592.4	606.8	621.1
	H	559.0	578.3	598.1	618.3	638.9	660.0	681.5	703.4	725.7	748.5	771.7
	S	2.079	2.134	2.189	2.244	2.298	2.353	2.407	2.460	2.514	2.567	2.620
200	V	237.1	244.8	252.5	260.1	267.7	275.2	282.7	290.2	297.6	305.1	312.5
	H	556.2	575.7	595.6	616.0	636.8	658.0	679.6	701.6	724.1	746.9	770.2
	S	1.976	2.031	2.087	2.142	2.197	2.252	2.306	2.360	2.414	2.467	2.520
300	V	155.1	160.5	165.8	171.1	176.3	181.4	186.6	191.6	196.7	201.8	206.8
	H	553.3	573.0	593.1	613.6	634.6	655.9	677.6	699.8	722.3	745.3	768.6
	S	1.911	1.968	2.024	2.080	2.135	2.190	2.245	2.299	2.353	2.407	2.460
400	V	114.1	118.3	122.4	126.5	130.5	134.5	138.4	142.4	146.2	150.1	154.0
	H	550.3	570.2	590.5	611.2	632.3	653.8	675.6	697.9	720.6	743.6	767.1
	S	1.864	1.921	1.978	2.034	2.090	2.145	2.200	2.255	2.309	2.363	2.416
500	V	89.42	92.92	96.36	99.73	103.1	106.3	109.6	112.8	116.0	119.1	122.2
	H	547.1	567.3	587.8	608.7	630.0	651.6	673.6	696.0	718.8	742.0	765.5
	S	1.825	1.883	1.941	1.997	2.054	2.109	2.165	2.220	2.274	2.328	2.382
600	V	72.91	75.96	78.94	81.86	84.72	87.53	90.30	93.04	95.75	98.43	101.1
	H	543.8	564.3	585.1	606.2	627.6	649.4	671.6	694.1	717.0	740.3	763.9
	S	1.792	1.851	1.909	1.966	2.023	2.079	2.135	2.190	2.245	2.299	2.353
700	V	61.05	63.80	66.47	69.06	71.60	74.08	76.52	78.93	81.30	83.65	85.97
	H	540.4	561.2	582.2	603.6	625.2	647.2	669.5	692.1	715.2	738.5	762.3
	S	1.763	1.823	1.881	1.939	1.997	2.053	2.109	2.165	2.220	2.274	2.328
800	V	52.10	54.64	57.08	59.44	61.74	63.98	66.18	68.33	70.46	72.55	74.62
	H	536.8	558.0	579.3	600.9	622.7	644.9	667.4	690.2	713.3	736.8	760.6
	S	1.736	1.797	1.856	1.915	1.973	2.030	2.086	2.142	2.197	2.252	2.307
900	V	45.09	47.47	49.74	51.93	54.05	56.11	58.12	60.08	62.02	63.92	65.80
	H	533.0	554.6	576.2	598.1	620.2	642.5	665.2	688.1	711.4	735.0	758.9
	S	1.711	1.773	1.833	1.893	1.951	2.009	2.065	2.122	2.177	2.232	2.287
1000	V	39.41	41.69	43.84	45.90	47.88	49.79	51.66	53.48	55.26	57.01	58.73
	H	529.0	551.0	573.1	595.2	617.5	640.1	662.9	686.1	709.5	733.2	757.2
	S	1.687	1.750	1.812	1.872	1.931	1.989	2.046	2.103	2.159	2.214	2.269

Table 12 (Continued)
Temperature range: 70 to 170°C

P	T	70	80	90	100	110	120	130	140	150	160	170
1200	V		32.88	34.89	36.78	38.57	40.28	41.93	43.54	45.10	46.62	48.12
	H		543.3	566.3	589.1	612.0	635.1	658.3	681.8	705.5	729.5	753.8
	S		1.707	1.771	1.833	1.894	1.953	2.012	2.069	2.126	2.182	2.238
1400	V			28.36	30.16	31.84	33.43	34.95	36.40	37.81	39.18	40.52
	H			558.7	582.5	606.2	629.8	653.5	677.3	701.4	725.7	750.2
	S			1.733	1.798	1.860	1.921	1.981	2.039	2.097	2.154	2.210
1600	V			23.28	25.09	26.72	28.24	29.67	31.02	32.33	33.59	34.81
	H			550.1	575.2	599.8	624.1	648.4	672.7	697.1	721.7	746.6
	S			1.695	1.764	1.829	1.891	1.952	2.012	2.070	2.128	2.184
1800	V				21.00	22.65	24.14	25.51	26.81	28.04	29.21	30.35
	H				566.9	592.8	618.0	642.9	667.8	692.7	717.6	742.8
	S				1.729	1.797	1.862	1.925	1.986	2.045	2.104	2.161
2000	V					19.28	20.79	22.15	23.40	24.58	25.70	26.77
	H					584.9	611.3	637.1	662.6	688.0	713.4	738.9
	S					1.766	1.834	1.899	1.961	2.022	2.081	2.139
2100	V					17.79	19.32	20.68	21.93	23.09	24.19	25.23
	H					580.5	607.7	634.0	659.9	685.6	711.2	736.9
	S					1.750	1.820	1.886	1.949	2.011	2.070	2.129
2200	V					16.38	17.97	19.34	20.58	21.72	22.80	23.83
	H					575.7	603.9	630.8	657.1	683.1	708.9	734.8
	S					1.733	1.805	1.873	1.937	1.999	2.060	2.119
2300	V					15.04	16.70	18.09	19.33	20.47	21.54	22.55
	H					570.4	599.8	627.4	654.2	680.5	706.6	732.7
	S					1.715	1.791	1.860	1.925	1.988	2.049	2.109
2400	V						15.51	16.94	18.19	19.32	20.37	21.37
	H						595.4	623.9	651.2	677.9	704.3	730.6
	S						1.775	1.847	1.914	1.977	2.039	2.099
2500	V						14.37	15.85	17.12	18.25	19.30	20.28
	H						590.7	620.1	648.0	675.1	701.9	728.4
	S						1.759	1.833	1.902	1.967	2.029	2.090
2600	V						13.28	14.83	16.12	17.26	18.30	19.27
	H						585.4	616.1	644.7	672.3	699.4	726.2
	S						1.742	1.820	1.890	1.956	2.019	2.080
2700	V						12.20	13.86	15.18	16.33	17.37	18.33
	H						579.3	611.9	641.3	669.4	696.8	723.9
	S						1.724	1.806	1.878	1.945	2.009	2.071
2800	V						11.11	12.93	14.30	15.46	16.50	17.46
	H						572.2	607.2	637.7	666.4	694.2	721.6
	S						1.703	1.791	1.865	1.934	1.999	2.062

Table 12 (Continued)
Temperature range: 70 to 170°C

P	T	70	80	90	100	110	120	130	140	150	160	170
2900	V H S							12.03 602.1 1.775	13.46 633.9 1.853	14.64 663.3 1.923	15.69 691.5 1.989	16.64 719.2 2.052
3000	V H S							11.14 596.4 1.758	12.66 629.8 1.840	13.87 660.0 1.912	14.92 688.8 1.979	15.87 716.8 2.043
3100	V H S							10.25 589.9 1.739	11.89 625.4 1.826	13.14 656.6 1.901	14.20 685.9 1.969	15.15 714.3 2.034
3200	V H S							9.322 581.9 1.717	11.14 620.7 1.812	12.44 653.0 1.889	13.52 682.9 1.959	14.47 711.8 2.025
3300	V H S							8.276 571.3 1.688	10.42 615.6 1.797	11.77 649.2 1.877	12.87 679.9 1.949	13.83 709.2 2.016
3400	V H S								9.696 609.8 1.781	11.13 645.2 1.865	12.25 676.7 1.939	13.22 706.5 2.007
3500	V H S								8.971 603.3 1.762	10.51 640.9 1.853	11.67 673.4 1.928	12.65 703.7 1.998
3600	V H S								8.225 595.6 1.742	9.911 636.4 1.839	11.11 669.9 1.918	12.10 700.9 1.988
3700	V H S								7.426 586.0 1.717	9.325 631.4 1.825	10.57 666.3 1.907	11.58 697.9 1.979
3800	V H S								6.507 572.8 1.683	8.751 626.1 1.811	10.05 662.5 1.896	11.08 694.9 1.970
3900	V H S								5.334 551.7 1.630	8.182 620.2 1.795	9.549 658.5 1.884	10.60 691.7 1.960
4000	V H S								4.203 524.3 1.563	7.616 613.6 1.777	9.066 654.3 1.872	10.14 688.5 1.951
4100	V H S								3.667 507.5 1.522	7.049 606.3 1.758	8.598 649.9 1.860	9.703 685.1 1.941

Table 12 (Continued)
Temperature range: 70 to 170°C

P	T	70	80	90	100	110	120	130	140	150	160	170
4200	V H S								3.420 498.5 1.499	6.480 597.9 1.737	8.144 645.2 1.847	9.282 681.7 1.931
4300	V H S								3.275 492.7 1.484	5.918 588.5 1.713	7.703 640.2 1.834	8.876 678.1 1.921
4400	V H S								3.176 488.5 1.473	5.385 578.4 1.688	7.274 634.9 1.820	8.486 674.3 1.910
4500	V H S								3.101 485.2 1.464	4.914 568.3 1.663	6.859 629.3 1.805	8.110 670.5 1.900
4600	V H S								3.041 482.5 1.457	4.523 558.9 1.640	6.460 623.4 1.790	7.748 666.4 1.889
4700	V H S								2.991 480.1 1.451	4.213 550.5 1.619	6.079 617.2 1.775	7.400 662.3 1.878
4800	V H S								2.949 478.1 1.445	3.969 543.3 1.601	5.722 610.9 1.759	7.066 658.0 1.866
4900	V H S								2.912 476.3 1.440	3.777 537.3 1.586	5.394 604.6 1.743	6.746 653.6 1.855
5000	V H S								2.880 474.7 1.435	3.626 532.1 1.573	5.096 598.4 1.727	6.442 649.1 1.843
5200	V H S								2.824 472.0 1.427	3.407 524.1 1.552	4.600 586.9 1.699	5.883 640.0 1.820
5400	V H S								2.778 469.6 1.420	3.257 518.2 1.536	4.220 577.0 1.674	5.395 630.9 1.797
5600	V H S								2.738 467.5 1.414	3.147 513.5 1.524	3.932 568.5 1.652	4.980 622.2 1.775
5800	V H S								2.704 465.7 1.408	3.062 509.8 1.514	3.712 561.4 1.634	4.635 614.2 1.755

Table 12 (Continued)
Temperature range: 70 to 170°C

P	T	70	80	90	100	110	120	130	140	150	160	170
6000	V H S								2.674 464.1 1.403	2.993 506.7 1.505	3.542 555.5 1.619	4.350 607.0 1.736
6200	V H S								2.646 462.6 1.398	2.936 504.0 1.497	3.408 550.6 1.606	4.116 600.5 1.720
6400	V H S								2.622 461.3 1.394	2.887 501.7 1.490	3.301 546.4 1.595	3.921 594.7 1.705
6600	V H S								2.599 460.1 1.389	2.844 499.7 1.484	3.212 542.9 1.585	3.760 589.6 1.692
6800	V H S								2.578 458.9 1.385	2.806 497.9 1.479	3.138 539.8 1.576	3.624 585.1 1.680
7000	V H S								2.559 457.9 1.382	2.773 496.2 1.473	3.075 537.1 1.569	3.510 581.1 1.669
7500	V H S								2.517 455.6 1.373	2.702 492.7 1.462	2.950 531.6 1.553	3.291 572.9 1.647
8000	V H S								2.481 453.7 1.365	2.646 489.9 1.452	2.857 527.4 1.539	3.135 566.7 1.629
8500	V H S								2.450 452.1 1.358	2.598 487.5 1.443	2.783 523.9 1.528	3.019 561.8 1.615
9000	V H S								2.422 450.6 1.352	2.558 485.5 1.435	2.723 521.1 1.519	2.927 557.8 1.602
10000	V H S								2.375 448.3 1.341	2.491 482.2 1.422	2.628 516.7 1.502	2.790 551.8 1.582
11000	V H S								2.337 446.6 1.331	2.438 479.7 1.410	2.556 513.3 1.488	2.692 547.4 1.566
12000	V H S								2.304 445.2 1.322	2.395 477.8 1.400	2.498 510.8 1.477	2.615 544.1 1.553

Table 12 (Continued)
Temperature range: 70 to 170°C

P	T	70	80	90	100	110	120	130	140	150	160	170
13000	V								2.276	2.358	2.450	2.554
	H								444.2	476.3	508.7	541.5
	S								1.314	1.391	1.466	1.541
14000	V								2.251	2.326	2.410	2.503
	H								443.5	475.1	507.1	539.4
	S								1.307	1.382	1.457	1.531
15000	V								2.229	2.298	2.375	2.460
	H								443.0	474.2	505.9	537.8
	S								1.300	1.375	1.449	1.521
16000	V								2.210	2.273	2.344	2.422
	H								442.6	473.5	504.9	536.5
	S								1.294	1.368	1.441	1.513
17000	V								2.192	2.251	2.317	2.389
	H								442.5	473.0	504.1	535.4
	S								1.288	1.361	1.434	1.505
18000	V								2.175	2.231	2.293	2.360
	H								442.4	472.7	503.5	534.6
	S								1.283	1.355	1.427	1.498
19000	V								2.160	2.213	2.270	2.333
	H								442.5	472.5	503.1	534.0
	S								1.278	1.349	1.421	1.491
20000	V								2.147	2.196	2.250	2.309
	H								442.7	472.5	502.8	533.5
	S								1.273	1.344	1.415	1.485
21000	V								2.134	2.180	2.232	2.288
	H								443.0	472.5	502.7	533.2
	S								1.268	1.339	1.409	1.479
22000	V								2.122	2.166	2.215	2.268
	H								443.4	472.6	502.6	533.0
	S								1.264	1.334	1.404	1.473
23000	V								2.110	2.152	2.199	2.249
	H								443.9	472.9	502.6	532.9
	S								1.260	1.330	1.399	1.468
24000	V								2.100	2.140	2.184	2.232
	H								444.4	473.2	502.8	532.9
	S								1.256	1.325	1.394	1.463
25000	V								2.090	2.128	2.170	2.217
	H								445.0	473.5	503.0	532.9
	S								1.253	1.321	1.390	1.458

Table 12 (Continued)
Temperature range: 180 to 280°C

P	T	180	190	200	210	220	230	240	250	260	270	280
5	V	1296.0	1325.0	1353.0	1382.0	1411.0	1439.0	1468.0	1496.0	1525.0	1554.0	1582.0
	H	796.7	820.6	844.9	869.7	894.8	920.3	946.2	972.5	999.1	1026.	1054.
	S	3.105	3.157	3.209	3.261	3.313	3.364	3.415	3.465	3.516	3.566	3.616
50	V	1290.	1320.	1350.	1380.	1410.	1440.	1470.	1490.	1520.	1550.	1580.
	H	796.0	820.0	844.4	869.1	894.3	919.8	945.7	972.0	998.7	1026.	1053.
	S	2.775	2.827	2.879	2.931	2.983	3.034	3.085	3.136	3.186	3.236	3.286
100	V	644.0	658.5	673.0	687.5	702.0	716.5	730.9	745.4	759.8	774.3	788.7
	H	795.3	819.3	843.7	868.5	893.7	919.2	945.2	971.5	998.2	1025.	1053.
	S	2.675	2.727	2.779	2.831	2.883	2.934	2.985	3.036	3.086	3.136	3.186
101.33	V	635.5	649.8	664.1	678.5	692.8	707.0	721.3	735.6	749.8	764.1	778.3
	H	795.3	819.3	843.7	868.5	893.7	919.2	945.2	971.5	998.2	1025.	1053.
	S	2.673	2.725	2.777	2.829	2.881	2.932	2.983	3.034	3.084	3.135	3.185
200	V	319.9	327.2	334.6	341.9	349.3	356.6	363.9	371.2	378.5	385.8	393.1
	H	793.9	817.9	842.4	867.2	892.5	918.1	944.1	970.4	997.1	1024.	1052.
	S	2.573	2.626	2.678	2.730	2.782	2.833	2.884	2.935	2.986	3.036	3.086
300	V	211.8	216.8	221.8	226.7	231.7	236.6	241.6	246.5	251.4	256.3	261.2
	H	792.4	816.5	841.1	866.0	891.3	916.9	943.0	969.4	996.1	1023.	1051.
	S	2.513	2.566	2.618	2.670	2.722	2.773	2.825	2.876	2.926	2.977	3.027
400	V	157.8	161.6	165.4	169.1	172.9	176.6	180.4	184.1	187.8	191.5	195.3
	H	790.9	815.1	839.7	864.7	890.0	915.8	941.8	968.3	995.1	1022.	1050.
	S	2.469	2.522	2.575	2.627	2.679	2.731	2.782	2.833	2.884	2.934	2.984
500	V	125.3	128.4	131.5	134.6	137.6	140.7	143.7	146.7	149.7	152.7	155.7
	H	789.4	813.7	838.4	863.4	888.8	914.6	940.7	967.2	994.1	1021.	1049.
	S	2.435	2.488	2.541	2.593	2.645	2.697	2.748	2.800	2.850	2.901	2.951
600	V	103.7	106.3	108.9	111.5	114.1	116.7	119.2	121.7	124.3	126.8	129.3
	H	787.9	812.2	837.0	862.1	887.6	913.4	939.6	966.1	993.0	1020.	1048.
	S	2.407	2.460	2.513	2.565	2.617	2.669	2.721	2.772	2.823	2.874	2.924
700	V	88.27	90.55	92.81	95.06	97.29	99.51	101.7	103.9	106.1	108.3	110.5
	H	786.3	810.8	835.6	860.8	886.3	912.2	938.4	965.0	992.0	1019.	1047.
	S	2.382	2.436	2.489	2.541	2.594	2.646	2.697	2.748	2.799	2.850	2.901
800	V	76.67	78.70	80.71	82.70	84.68	86.65	88.61	90.56	92.49	94.42	96.34
	H	784.8	809.3	834.2	859.5	885.0	911.0	937.3	963.9	990.9	1018.	1046.
	S	2.361	2.414	2.467	2.520	2.573	2.625	2.676	2.728	2.779	2.830	2.880
900	V	67.65	69.48	71.30	73.10	74.88	76.65	78.41	80.16	81.90	83.63	85.35
	H	783.2	807.8	832.8	858.1	883.8	909.8	936.1	962.8	989.9	1017.	1045.
	S	2.341	2.395	2.448	2.501	2.554	2.606	2.658	2.709	2.761	2.812	2.862
1000	V	60.43	62.11	63.76	65.41	67.03	68.65	70.25	71.84	73.42	74.99	76.56
	H	781.6	806.3	831.4	856.8	882.5	908.6	935.0	961.7	988.8	1016.	1044.
	S	2.324	2.378	2.431	2.484	2.537	2.589	2.641	2.693	2.744	2.795	2.846

Table 12 (Continued)
Temperature range: 180 to 280°C

P	T	180	190	200	210	220	230	240	250	260	270	280
1200	V	49.59	51.03	52.46	53.87	55.26	56.64	58.01	59.36	60.71	62.04	63.37
	H	778.4	803.3	828.5	854.0	879.9	906.1	932.6	959.5	986.7	1014.	1042.
	S	2.292	2.347	2.401	2.454	2.507	2.560	2.612	2.664	2.715	2.766	2.817
1400	V	41.83	43.11	44.38	45.62	46.85	48.06	49.26	50.45	51.62	52.79	53.95
	H	775.0	800.1	825.5	851.3	877.3	903.6	930.2	957.2	984.5	1012.	1040.
	S	2.265	2.320	2.374	2.428	2.481	2.534	2.586	2.638	2.690	2.741	2.792
1600	V	36.00	37.16	38.31	39.43	40.53	41.62	42.70	43.76	44.81	45.85	46.89
	H	771.6	796.9	822.5	848.4	874.6	901.1	927.8	954.9	982.3	1010.	1038.
	S	2.240	2.296	2.350	2.404	2.458	2.511	2.564	2.616	2.668	2.719	2.771
1800	V	31.46	32.53	33.58	34.61	35.62	36.61	37.59	38.56	39.51	40.46	41.39
	H	768.1	793.7	819.5	845.5	871.9	898.5	925.4	952.6	980.1	1008.	1036.
	S	2.218	2.273	2.329	2.383	2.437	2.490	2.543	2.596	2.648	2.700	2.751
2000	V	27.81	28.81	29.79	30.75	31.68	32.60	33.50	34.39	35.27	36.14	37.00
	H	764.5	790.3	816.3	842.6	869.1	895.9	922.9	950.2	977.9	1006.	1034.
	S	2.197	2.253	2.309	2.363	2.418	2.472	2.525	2.578	2.630	2.682	2.733
2100	V	26.24	27.22	28.17	29.09	30.00	30.88	31.75	32.61	33.46	34.29	35.12
	H	762.6	788.6	814.7	841.1	867.7	894.5	921.6	949.0	976.7	1005.	1033.
	S	2.187	2.243	2.299	2.354	2.409	2.463	2.516	2.569	2.621	2.673	2.725
2200	V	24.82	25.77	26.69	27.58	28.46	29.32	30.16	30.99	31.80	32.61	33.40
	H	760.8	786.8	813.1	839.6	866.3	893.2	920.4	947.8	975.6	1004.	1032.
	S	2.177	2.234	2.290	2.345	2.400	2.454	2.507	2.560	2.613	2.665	2.717
2300	V	23.51	24.44	25.34	26.21	27.06	27.89	28.71	29.51	30.30	31.07	31.84
	H	758.8	785.1	811.5	838.0	864.8	891.8	919.1	946.6	974.4	1003.	1031.
	S	2.167	2.225	2.281	2.336	2.391	2.446	2.499	2.552	2.605	2.657	2.709
2400	V	22.31	23.22	24.10	24.95	25.77	26.58	27.37	28.15	28.91	29.67	30.41
	H	756.9	783.3	809.8	836.5	863.4	890.5	917.8	945.4	973.3	1001.	1030.
	S	2.158	2.216	2.272	2.328	2.383	2.438	2.491	2.545	2.597	2.650	2.701
2500	V	21.21	22.10	22.95	23.78	24.59	25.38	26.15	26.90	27.64	28.37	29.09
	H	754.9	781.5	808.1	834.9	861.9	889.1	916.5	944.2	972.1	1000.	1029.
	S	2.149	2.207	2.264	2.320	2.375	2.430	2.484	2.537	2.590	2.642	2.694
2600	V	20.19	21.06	21.90	22.71	23.50	24.26	25.01	25.75	26.47	27.18	27.87
	H	752.9	779.6	806.4	833.4	860.4	887.7	915.2	943.0	971.0	999.2	1028.
	S	2.140	2.198	2.255	2.312	2.367	2.422	2.476	2.530	2.583	2.635	2.687
2700	V	19.24	20.10	20.92	21.71	22.48	23.23	23.96	24.68	25.38	26.07	26.75
	H	750.9	777.8	804.7	831.8	859.0	886.3	913.9	941.8	969.8	998.1	1027.
	S	2.131	2.190	2.247	2.304	2.359	2.414	2.469	2.522	2.576	2.628	2.680
2800	V	18.35	19.20	20.01	20.79	21.54	22.28	22.99	23.69	24.37	25.04	25.70
	H	748.8	775.9	803.0	830.1	857.5	884.9	912.6	940.5	968.6	997.0	1026.
	S	2.122	2.181	2.239	2.296	2.352	2.407	2.462	2.515	2.569	2.621	2.674

Table 12 (Continued)
Temperature range: 180 to 280°C

P	T	180	190	200	210	220	230	240	250	260	270	280
2900	V	17.53	18.36	19.16	19.93	20.67	21.38	22.08	22.76	23.43	24.09	24.73
	H	746.7	773.9	801.2	828.5	855.9	883.5	911.3	939.3	967.5	995.9	1025.
	S	2.114	2.173	2.231	2.288	2.345	2.400	2.455	2.509	2.562	2.615	2.667
3000	V	16.75	17.58	18.37	19.12	19.85	20.55	21.23	21.90	22.55	23.19	23.82
	H	744.5	772.0	799.4	826.9	854.4	882.1	910.0	938.0	966.3	994.8	1024.
	S	2.105	2.165	2.224	2.281	2.337	2.393	2.448	2.502	2.556	2.608	2.661
3100	V	16.03	16.85	17.63	18.37	19.08	19.77	20.44	21.10	21.73	22.36	22.97
	H	742.3	770.0	797.6	825.2	852.9	880.7	908.6	936.8	965.1	993.7	1022.
	S	2.096	2.157	2.216	2.274	2.330	2.386	2.441	2.495	2.549	2.602	2.655
3200	V	15.35	16.16	16.93	17.66	18.36	19.04	19.70	20.34	20.97	21.58	22.18
	H	740.0	768.0	795.8	823.5	851.3	879.2	907.3	935.5	963.9	992.5	1021.
	S	2.088	2.149	2.208	2.265	2.323	2.379	2.435	2.489	2.543	2.596	2.649
3300	V	14.70	15.51	16.27	17.00	17.69	18.36	19.00	19.63	20.24	20.84	21.43
	H	737.7	765.9	793.9	821.8	849.7	877.8	905.9	934.2	962.7	991.4	1020.
	S	2.080	2.141	2.201	2.259	2.317	2.373	2.428	2.483	2.537	2.590	2.643
3400	V	14.10	14.90	15.65	16.37	17.05	17.71	18.34	18.96	19.56	20.15	20.73
	H	735.4	763.8	792.0	820.1	848.2	876.3	904.5	932.9	961.5	990.2	1019.
	S	2.071	2.133	2.194	2.252	2.310	2.366	2.422	2.477	2.531	2.584	2.637
3500	V	13.52	14.32	15.07	15.78	16.45	17.10	17.73	18.33	18.92	19.50	20.06
	H	733.0	761.7	790.1	818.3	846.6	874.8	903.1	931.6	960.3	989.1	1018.
	S	2.063	2.126	2.186	2.245	2.303	2.360	2.416	2.471	2.525	2.578	2.631
3600	V	12.98	13.78	14.52	15.22	15.89	16.52	17.14	17.74	18.32	18.88	19.44
	H	730.5	759.5	788.2	816.6	844.9	873.3	901.8	930.3	959.0	987.9	1017.
	S	2.055	2.118	2.179	2.239	2.297	2.354	2.410	2.465	2.519	2.573	2.626
3700	V	12.46	13.26	14.00	14.69	15.35	15.98	16.59	17.18	17.75	18.30	18.85
	H	728.0	757.3	786.2	814.8	843.3	871.8	900.4	929.0	957.8	986.8	1016.
	S	2.046	2.110	2.172	2.232	2.290	2.347	2.404	2.459	2.513	2.567	2.620
3800	V	11.96	12.76	13.50	14.19	14.84	15.46	16.06	16.64	17.20	17.75	18.29
	H	725.5	755.1	784.2	813.0	841.7	870.3	898.9	927.7	956.6	985.6	1015.
	S	2.038	2.103	2.165	2.225	2.284	2.341	2.398	2.453	2.508	2.562	2.615
3900	V	11.49	12.29	13.03	13.71	14.36	14.97	15.57	16.14	16.69	17.23	17.76
	H	722.8	752.8	782.2	811.2	840.0	868.7	897.5	926.4	955.3	984.5	1014.
	S	2.030	2.095	2.158	2.218	2.277	2.335	2.392	2.447	2.502	2.556	2.610
4000	V	11.05	11.85	12.58	13.26	13.90	14.51	15.09	15.66	16.20	16.73	17.25
	H	720.1	750.5	780.1	809.3	838.3	867.2	896.1	925.0	954.1	983.3	1013.
	S	2.021	2.087	2.151	2.212	2.271	2.329	2.386	2.442	2.497	2.551	2.605
4100	V	10.62	11.42	12.15	12.83	13.46	14.07	14.64	15.20	15.74	16.26	16.77
	H	717.4	748.1	778.0	807.5	836.6	865.6	894.7	923.7	952.9	982.1	1012.
	S	2.013	2.080	2.144	2.205	2.265	2.323	2.380	2.436	2.492	2.546	2.600

Table 12 (Continued)
Temperature range: 180 to 280°C

P	T	180	190	200	210	220	230	240	250	260	270	280
4200	V	10.21	11.01	11.74	12.42	13.05	13.65	14.22	14.77	15.30	15.81	16.32
	H	714.6	745.7	775.9	805.6	834.9	864.1	893.2	922.4	951.6	980.9	1010.
	S	2.004	2.072	2.137	2.199	2.259	2.317	2.375	2.431	2.486	2.541	2.595
4300	V	9.815	10.63	11.35	12.02	12.65	13.24	13.81	14.35	14.88	15.39	15.88
	H	711.7	743.3	773.8	803.7	833.2	862.5	891.8	921.0	950.3	979.8	1009.
	S	1.996	2.065	2.130	2.192	2.253	2.312	2.369	2.426	2.481	2.536	2.590
4400	V	9.438	10.25	10.98	11.65	12.27	12.86	13.42	13.96	14.48	14.98	15.47
	H	708.7	740.8	771.6	801.7	831.4	860.9	890.3	919.7	949.1	978.6	1008.
	S	1.987	2.057	2.123	2.186	2.247	2.306	2.364	2.420	2.476	2.531	2.585
4500	V	9.077	9.897	10.63	11.29	11.91	12.49	13.05	13.58	14.09	14.59	15.07
	H	705.7	738.2	769.4	799.8	829.7	859.3	888.8	918.3	947.8	977.4	1007.
	S	1.978	2.049	2.116	2.179	2.241	2.300	2.358	2.415	2.471	2.526	2.580
4600	V	8.730	9.556	10.29	10.95	11.57	12.14	12.69	13.22	13.73	14.22	14.69
	H	702.5	735.6	767.2	797.8	827.9	857.7	887.3	916.9	946.5	976.2	1006.
	S	1.969	2.041	2.109	2.173	2.235	2.294	2.353	2.410	2.466	2.521	2.575
4700	V	8.397	9.229	9.960	10.62	11.24	11.81	12.36	12.88	13.38	13.86	14.33
	H	699.3	733.0	764.9	795.8	826.1	856.1	885.8	915.5	945.2	975.0	1005.
	S	1.960	2.034	2.102	2.167	2.229	2.289	2.347	2.405	2.461	2.516	2.571
4800	V	8.078	8.915	9.647	10.31	10.92	11.49	12.03	12.55	13.04	13.52	13.98
	H	696.1	730.3	762.6	793.8	824.3	854.4	884.3	914.2	944.0	973.8	1004.
	S	1.951	2.026	2.095	2.160	2.223	2.283	2.342	2.400	2.456	2.512	2.566
4900	V	7.771	8.614	9.347	10.01	10.61	11.18	11.72	12.23	12.72	13.19	13.65
	H	692.7	727.6	760.3	791.7	822.5	852.8	882.8	912.8	942.7	972.6	1003.
	S	1.942	2.018	2.088	2.154	2.217	2.278	2.337	2.395	2.451	2.507	2.562
5000	V	7.477	8.325	9.060	9.719	10.32	10.89	11.42	11.93	12.41	12.88	13.33
	H	689.3	724.8	757.9	789.7	820.6	851.1	881.3	911.4	941.4	971.4	1001.
	S	1.933	2.010	2.081	2.148	2.211	2.272	2.332	2.390	2.446	2.502	2.557
5200	V	6.927	7.783	8.519	9.176	9.776	10.33	10.86	11.36	11.83	12.29	12.73
	H	682.3	719.1	753.1	785.5	816.9	847.8	878.3	908.6	938.8	968.9	999.2
	S	1.914	1.995	2.067	2.135	2.199	2.261	2.321	2.380	2.437	2.493	2.548
5400	V	6.426	7.284	8.021	8.675	9.271	9.822	10.34	10.83	11.30	11.75	12.18
	H	675.2	713.3	748.2	781.3	813.2	844.4	875.2	905.7	936.1	966.5	996.9
	S	1.896	1.979	2.054	2.123	2.188	2.251	2.311	2.370	2.428	2.484	2.540
5600	V	5.575	6.827	7.562	8.213	8.804	9.349	9.860	10.34	10.80	11.24	11.67
	H	668.0	707.5	743.3	777.0	809.4	841.0	872.1	902.9	933.5	964.1	994.6
	S	1.877	1.963	2.040	2.110	2.177	2.240	2.301	2.361	2.419	2.475	2.531
5800	V	5.575	6.411	7.140	7.786	8.372	8.911	9.415	9.890	10.34	10.78	11.19
	H	660.9	701.5	738.3	772.6	805.5	837.5	869.0	900.0	930.9	961.6	992.3
	S	1.859	1.948	2.026	2.098	2.165	2.230	2.291	2.351	2.410	2.467	2.523

Table 12 (Continued)
Temperature range: 180 to 280°C

P	T	180	190	200	210	220	230	240	250	260	270	280
6000	V	5.224	6.034	6.752	7.392	7.972	8.505	9.002	9.470	9.915	10.34	10.75
	H	654.0	695.6	733.2	768.2	801.7	834.1	865.8	897.2	928.2	959.2	990.0
	S	1.841	1.932	2.012	2.086	2.154	2.219	2.282	2.342	2.401	2.458	2.515
6200	V	4.919	5.695	6.398	7.029	7.601	8.128	8.618	9.080	9.518	9.936	10.34
	H	647.5	689.8	728.2	763.9	797.8	830.6	862.7	894.3	925.6	956.7	987.7
	S	1.825	1.917	1.999	2.074	2.143	2.209	2.272	2.333	2.392	2.450	2.507
6400	V	4.656	5.392	6.074	6.693	7.258	7.777	8.261	8.716	9.147	9.559	9.954
	H	641.5	684.2	723.2	759.5	793.9	827.1	859.5	891.4	922.9	954.2	985.4
	S	1.809	1.902	1.986	2.062	2.132	2.199	2.263	2.324	2.384	2.442	2.499
6600	V	4.429	5.122	5.780	6.385	6.940	7.452	7.928	8.377	8.801	9.206	9.594
	H	635.8	678.8	718.3	755.1	790.1	823.7	856.4	888.5	920.3	951.8	983.1
	S	1.795	1.889	1.973	2.050	2.122	2.189	2.253	2.315	2.376	2.434	2.491
6800	V	4.234	4.882	5.513	6.102	6.646	7.149	7.618	8.060	8.477	8.876	9.257
	H	630.6	673.6	713.6	750.9	786.2	820.2	853.2	885.6	917.6	949.3	980.8
	S	1.781	1.875	1.961	2.039	2.111	2.179	2.244	2.307	2.367	2.426	2.484
7000	V	4.065	4.670	5.271	5.842	6.373	6.868	7.329	7.763	8.174	8.566	8.941
	H	625.9	668.8	709.0	746.7	782.4	816.8	850.1	882.8	915.0	946.9	978.6
	S	1.769	1.863	1.949	2.027	2.101	2.170	2.235	2.298	2.359	2.419	2.476
7500	V	3.733	4.240	4.766	5.285	5.780	6.248	6.688	7.103	7.498	7.873	8.233
	H	615.7	657.9	698.3	736.6	773.2	808.3	842.4	875.7	908.4	940.8	972.9
	S	1.742	1.834	1.921	2.001	2.076	2.146	2.213	2.278	2.340	2.400	2.458
8000	V	3.495	3.919	4.376	4.840	5.294	5.731	6.148	6.543	6.920	7.280	7.625
	H	607.6	648.8	688.9	727.4	764.5	800.2	834.9	868.7	902.0	934.8	967.3
	S	1.720	1.810	1.896	1.977	2.053	2.124	2.193	2.258	2.321	2.382	2.441
8500	V	3.317	3.676	4.072	4.484	4.897	5.302	5.692	6.066	6.425	6.768	7.098
	H	601.1	641.1	680.7	719.2	756.5	792.6	827.7	862.1	895.7	929.0	961.8
	S	1.702	1.790	1.874	1.955	2.031	2.104	2.173	2.239	2.303	2.365	2.425
9000	V	3.181	3.487	3.832	4.198	4.572	4.943	5.307	5.659	5.999	6.326	6.641
	H	595.8	634.7	673.6	711.9	749.2	785.5	821.0	855.7	889.7	923.3	956.5
	S	1.687	1.772	1.855	1.935	2.012	2.085	2.154	2.221	2.286	2.348	2.409
10000	V	2.985	3.217	3.483	3.774	4.080	4.392	4.704	5.012	5.314	5.609	5.895
	H	587.8	624.8	662.2	699.7	736.7	773.1	808.8	843.9	878.5	912.7	946.4
	S	1.663	1.743	1.823	1.902	1.978	2.051	2.121	2.189	2.254	2.318	2.379
11000	V	2.850	3.034	3.246	3.482	3.734	3.996	4.264	4.532	4.798	5.061	5.319
	H	582.1	617.6	653.7	690.2	726.6	762.8	798.5	833.7	868.6	903.0	937.2
	S	1.644	1.721	1.798	1.875	1.949	2.022	2.092	2.160	2.226	2.290	2.352
12000	V	2.749	2.902	3.076	3.270	3.481	3.704	3.934	4.168	4.403	4.637	4.869
	H	577.8	612.2	647.3	682.8	718.5	754.2	789.7	825.0	859.9	894.5	928.9
	S	1.628	1.703	1.778	1.852	1.926	1.997	2.067	2.135	2.201	2.265	2.328

Table 12 (Continued)
Temperature range: 180 to 280°C

F	T	180	190	200	210	220	230	240	250	260	270	280
13000	V	2.670	2.801	2.948	3.112	3.291	3.482	3.682	3.887	4.095	4.304	4.512
	H	574.5	608.1	642.3	676.9	712.0	747.2	782.4	817.4	852.3	887.0	921.4
	S	1.615	1.688	1.761	1.834	1.905	1.976	2.045	2.113	2.179	2.243	2.306
14000	V	2.606	2.720	2.847	2.988	3.143	3.309	3.484	3.665	3.850	4.037	4.225
	H	572.0	604.9	638.3	672.3	706.7	741.4	776.2	811.0	845.8	880.4	914.9
	S	1.603	1.675	1.747	1.818	1.888	1.958	2.026	2.094	2.159	2.224	2.287
15000	V	2.552	2.654	2.766	2.889	3.024	3.170	3.324	3.485	3.651	3.819	3.990
	H	565.9	602.3	635.2	668.5	702.4	736.6	771.0	805.5	840.1	874.6	909.1
	S	1.593	1.664	1.734	1.804	1.873	1.942	2.010	2.076	2.142	2.206	2.269
16000	V	2.506	2.598	2.698	2.808	2.927	3.056	3.194	3.338	3.487	3.640	3.795
	H	568.3	600.3	632.7	665.5	698.8	732.5	766.6	800.8	835.2	869.6	904.0
	S	1.584	1.654	1.723	1.792	1.860	1.928	1.995	2.061	2.126	2.190	2.252
17000	V	2.467	2.550	2.641	2.739	2.846	2.962	3.085	3.215	3.350	3.489	3.631
	H	566.9	598.6	630.6	663.1	695.9	729.2	762.9	796.8	830.9	865.1	899.4
	S	1.575	1.645	1.713	1.781	1.848	1.915	1.981	2.047	2.111	2.175	2.237
18000	V	2.432	2.509	2.591	2.681	2.777	2.882	2.993	3.111	3.234	3.361	3.491
	H	565.9	597.3	629.0	661.1	693.5	726.4	759.7	793.3	827.2	861.3	895.4
	S	1.568	1.636	1.704	1.771	1.838	1.904	1.969	2.034	2.098	2.161	2.224
19000	V	2.400	2.472	2.548	2.630	2.718	2.813	2.914	3.022	3.134	3.251	3.371
	H	565.0	596.2	627.7	659.4	691.5	724.1	757.0	790.4	824.0	857.9	891.9
	S	1.561	1.629	1.696	1.762	1.828	1.893	1.958	2.023	2.086	2.149	2.211
20000	V	2.372	2.439	2.510	2.586	2.667	2.753	2.846	2.944	3.048	3.155	3.266
	H	564.4	595.4	626.6	658.1	689.9	722.2	754.8	787.8	821.2	854.9	888.7
	S	1.554	1.622	1.688	1.754	1.819	1.884	1.948	2.012	2.075	2.138	2.199
21000	V	2.347	2.410	2.476	2.546	2.621	2.701	2.786	2.877	2.972	3.072	3.175
	H	563.9	594.7	625.8	657.0	688.6	720.6	752.9	785.7	818.8	852.3	885.9
	S	1.548	1.615	1.681	1.747	1.811	1.875	1.939	2.002	2.065	2.127	2.189
22000	V	2.324	2.383	2.446	2.511	2.581	2.655	2.734	2.817	2.905	2.998	3.094
	H	563.5	594.2	625.1	656.2	687.5	719.2	751.4	783.9	816.7	850.0	883.5
	S	1.542	1.609	1.675	1.740	1.804	1.867	1.931	1.993	2.056	2.117	2.179
23000	V	2.303	2.359	2.418	2.480	2.545	2.614	2.687	2.764	2.846	2.932	3.022
	H	563.3	593.9	624.6	655.5	686.7	718.2	750.0	782.3	815.0	848.0	881.3
	S	1.536	1.603	1.668	1.733	1.797	1.860	1.923	1.985	2.047	2.108	2.169
24000	V	2.283	2.337	2.392	2.451	2.512	2.577	2.645	2.717	2.793	2.874	2.957
	H	563.2	593.6	624.2	655.0	686.0	717.3	749.0	781.0	813.5	846.3	879.5
	S	1.531	1.597	1.663	1.727	1.790	1.853	1.916	1.977	2.039	2.100	2.160
25000	V	2.265	2.316	2.369	2.424	2.482	2.543	2.607	2.675	2.746	2.821	2.899
	H	563.1	593.5	624.0	654.6	685.5	716.6	748.1	780.0	812.2	844.8	877.8
	S	1.526	1.592	1.657	1.721	1.784	1.847	1.909	1.970	2.031	2.092	2.152

Table 12 (Continued)
Temperature range: 290 to 390°C

P	T	290	300	310	320	330	340	350	360	370	380	390
5	V	16110.	16400.	16680.	16970.	17250.	17540.	17830.	18110.	18400.	18690.	18970.
	H	1081.	1109.	1138.	1167.	1196.	1225.	1255.	1285.	1315.	1346.	1377.
	S	3.666	3.715	3.764	3.813	3.862	3.910	3.958	4.006	4.054	4.101	4.148
50	V	1610.	1640.	1670.	1690.	1720.	1750.	1780.	1810.	1840.	1870.	1900.
	H	1081.	1109.	1137.	1166.	1195.	1225.	1254.	1285.	1315.	1346.	1377.
	S	3.336	3.385	3.435	3.483	3.532	3.581	3.629	3.677	3.724	3.772	3.819
100	V	805.1	817.6	832.0	846.4	860.8	875.2	889.6	904.0	918.4	932.8	947.1
	H	1080.	1108.	1137.	1166.	1195.	1224.	1254.	1284.	1315.	1345.	1376.
	S	3.236	3.286	3.335	3.384	3.433	3.481	3.529	3.577	3.625	3.672	3.719
101.33	V	792.6	806.8	821.0	835.3	849.5	863.7	877.9	892.1	906.3	920.5	934.7
	H	1080.	1108.	1137.	1166.	1195.	1224.	1254.	1284.	1315.	1345.	1376.
	S	3.234	3.284	3.333	3.382	3.431	3.479	3.527	3.575	3.623	3.670	3.717
200	V	400.3	407.6	414.9	422.1	429.4	436.6	443.9	451.1	458.4	465.6	472.8
	H	1079.	1108.	1136.	1165.	1194.	1224.	1253.	1283.	1314.	1345.	1376.
	S	3.136	3.185	3.235	3.284	3.332	3.381	3.429	3.477	3.525	3.572	3.619
300	V	266.1	271.0	275.8	280.7	285.6	290.5	295.3	300.2	305.0	309.9	314.7
	H	1079.	1107.	1135.	1164.	1193.	1223.	1253.	1283.	1313.	1344.	1375.
	S	3.077	3.126	3.176	3.225	3.273	3.322	3.370	3.418	3.466	3.513	3.561
400	V	199.0	202.6	206.3	210.0	213.7	217.4	221.0	224.7	228.4	232.0	235.7
	H	1078.	1106.	1134.	1163.	1192.	1222.	1252.	1282.	1313.	1343.	1374.
	S	3.034	3.084	3.133	3.182	3.231	3.280	3.328	3.376	3.424	3.472	3.519
500	V	158.7	161.7	164.6	167.6	170.6	173.5	176.5	179.4	182.4	185.3	188.2
	H	1077.	1105.	1134.	1162.	1192.	1221.	1251.	1281.	1312.	1343.	1374.
	S	3.001	3.051	3.100	3.150	3.198	3.247	3.295	3.343	3.391	3.439	3.486
600	V	131.8	134.3	136.8	139.3	141.8	144.3	146.8	149.2	151.7	154.2	156.6
	H	1076.	1104.	1133.	1162.	1191.	1220.	1250.	1281.	1311.	1342.	1373.
	S	2.974	3.024	3.073	3.122	3.171	3.220	3.268	3.317	3.364	3.412	3.459
700	V	112.6	114.8	117.0	119.1	121.3	123.4	125.5	127.7	129.8	131.9	134.0
	H	1075.	1103.	1132.	1161.	1190.	1220.	1250.	1280.	1310.	1341.	1372.
	S	2.951	3.001	3.050	3.099	3.148	3.197	3.245	3.294	3.341	3.389	3.436
800	V	98.26	100.2	102.1	104.0	105.9	107.7	109.6	111.5	113.4	115.2	117.1
	H	1074.	1102.	1131.	1160.	1189.	1219.	1249.	1279.	1310.	1341.	1372.
	S	2.930	2.980	3.030	3.079	3.128	3.177	3.225	3.274	3.322	3.369	3.417
900	V	87.07	88.78	90.48	92.18	93.87	95.56	97.24	98.92	100.6	102.3	103.9
	H	1073.	1101.	1130.	1159.	1188.	1218.	1248.	1278.	1309.	1340.	1371.
	S	2.912	2.962	3.012	3.061	3.110	3.159	3.208	3.256	3.304	3.352	3.399
1000	V	78.12	79.67	81.21	82.75	84.29	85.82	87.34	88.86	90.38	91.89	93.40
	H	1072.	1100.	1129.	1158.	1188.	1217.	1247.	1278.	1308.	1339.	1370.
	S	2.896	2.946	2.996	3.045	3.094	3.143	3.192	3.240	3.288	3.336	3.383

Table 12 (Continued)
Temperature range: 290 to 390°C

P	T	290	300	310	320	330	340	350	360	370	380	390
1200	V	64.69	66.01	67.31	68.62	69.91	71.20	72.49	73.77	75.05	76.33	77.60
	H	1070.	1099.	1127.	1157.	1186.	1216.	1246.	1276.	1307.	1338.	1369.
	S	2.667	2.918	2.967	3.017	3.066	3.115	3.164	3.212	3.260	3.308	3.355
1400	V	55.10	56.25	57.39	58.52	59.65	60.77	61.89	63.00	64.11	65.22	66.32
	H	1068.	1097.	1126.	1155.	1184.	1214.	1244.	1275.	1305.	1336.	1368.
	S	2.843	2.893	2.943	2.993	3.042	3.091	3.140	3.188	3.236	3.284	3.332
1600	V	47.91	48.93	49.94	50.95	51.95	52.94	53.94	54.92	55.90	56.88	57.86
	H	1066.	1095.	1124.	1153.	1183.	1213.	1243.	1273.	1304.	1335.	1366.
	S	2.821	2.872	2.922	2.972	3.021	3.070	3.119	3.167	3.216	3.263	3.311
1800	V	40.32	43.24	44.16	45.06	45.96	46.86	47.75	48.64	49.52	50.40	51.28
	H	1064.	1093.	1122.	1151.	1181.	1211.	1241.	1272.	1303.	1334.	1365.
	S	2.802	2.852	2.903	2.952	3.002	3.051	3.100	3.149	3.197	3.245	3.293
2000	V	37.85	38.69	39.53	40.35	41.18	42.00	42.81	43.62	44.42	45.22	46.02
	H	1062.	1091.	1120.	1150.	1179.	1209.	1240.	1270.	1301.	1332.	1364.
	S	2.784	2.835	2.885	2.935	2.985	3.034	3.083	3.132	3.180	3.228	3.276
2100	V	35.93	36.74	37.54	38.34	39.13	39.91	40.69	41.46	42.23	43.00	43.76
	H	1061.	1090.	1119.	1149.	1179.	1209.	1239.	1270.	1300.	1332.	1363.
	S	2.776	2.827	2.877	2.927	2.977	3.026	3.075	3.124	3.172	3.220	3.268
2200	V	34.19	34.97	35.74	36.50	37.26	38.02	38.76	39.51	40.25	40.98	41.72
	H	1061.	1089.	1119.	1148.	1178.	1208.	1238.	1269.	1300.	1331.	1362.
	S	2.768	2.819	2.869	2.919	2.969	3.019	3.068	3.116	3.165	3.213	3.261
2300	V	32.60	33.35	34.09	34.83	35.56	36.29	37.01	37.72	38.43	39.14	39.85
	H	1060.	1088.	1118.	1147.	1177.	1207.	1237.	1268.	1299.	1330.	1362.
	S	2.760	2.811	2.862	2.912	2.962	3.011	3.060	3.109	3.158	3.206	3.254
2400	V	31.14	31.87	32.59	33.30	34.00	34.70	35.40	36.09	36.77	37.45	38.13
	H	1059.	1087.	1117.	1146.	1176.	1206.	1237.	1267.	1298.	1330.	1361.
	S	2.753	2.804	2.854	2.905	2.955	3.004	3.053	3.102	3.151	3.199	3.247
2500	V	29.80	30.50	31.20	31.89	32.57	33.24	33.92	34.58	35.24	35.90	36.56
	H	1058.	1087.	1116.	1145.	1175.	1205.	1236.	1267.	1298.	1329.	1360.
	S	2.746	2.797	2.847	2.898	2.948	2.997	3.046	3.095	3.144	3.192	3.240
2600	V	28.56	29.24	29.92	30.58	31.24	31.90	32.55	33.19	33.83	34.47	35.10
	H	1057.	1086.	1115.	1145.	1174.	1205.	1235.	1266.	1297.	1328.	1360.
	S	2.739	2.790	2.841	2.891	2.941	2.991	3.040	3.089	3.137	3.186	3.234
2700	V	27.42	28.08	28.73	29.38	30.02	30.65	31.28	31.91	32.53	33.14	33.76
	H	1056.	1085.	1114.	1144.	1174.	1204.	1234.	1265.	1296.	1327.	1359.
	S	2.732	2.783	2.834	2.884	2.934	2.984	3.034	3.082	3.131	3.179	3.227
2800	V	26.35	27.00	27.63	28.26	28.88	29.50	30.11	30.71	31.32	31.91	32.51
	H	1055.	1084.	1113.	1143.	1173.	1203.	1234.	1264.	1295.	1327.	1358.
	S	2.725	2.777	2.828	2.878	2.928	2.978	3.027	3.076	3.125	3.173	3.221

Table 12 (Continued)
Temperature range: 290 to 390°F

P	T	290	300	310	320	330	340	350	360	370	380	390
2900	V	25.36	25.99	26.61	27.22	27.82	28.42	29.02	29.60	30.19	30.77	31.34
	H	1054.	1083.	1112.	1142.	1172.	1202.	1233.	1264.	1295.	1326.	1358.
	S	2.719	2.770	2.821	2.872	2.922	2.972	3.021	3.070	3.119	3.168	3.216
3000	V	24.44	25.05	25.65	26.25	26.84	27.42	28.00	28.57	29.14	29.70	30.26
	H	1053.	1082.	1111.	1141.	1171.	1201.	1232.	1263.	1294.	1325.	1357.
	S	2.713	2.764	2.815	2.866	2.916	2.966	3.016	3.065	3.113	3.162	3.210
3100	V	23.58	24.17	24.76	25.34	25.91	26.48	27.04	27.60	28.15	28.70	29.24
	H	1051.	1081.	1110.	1140.	1170.	1201.	1231.	1262.	1293.	1325.	1356.
	S	2.707	2.758	2.809	2.860	2.910	2.960	3.010	3.059	3.108	3.156	3.205
3200	V	22.77	23.35	23.92	24.49	25.05	25.60	26.15	26.69	27.23	27.76	28.29
	H	1050.	1080.	1109.	1139.	1169.	1200.	1230.	1261.	1293.	1324.	1356.
	S	2.701	2.752	2.804	2.854	2.905	2.955	3.004	3.054	3.102	3.151	3.199
3300	V	22.01	22.58	23.14	23.69	24.23	24.77	25.31	25.84	26.36	26.88	27.40
	H	1049.	1079.	1108.	1138.	1169.	1199.	1230.	1261.	1292.	1323.	1355.
	S	2.695	2.747	2.798	2.849	2.899	2.949	2.999	3.048	3.097	3.146	3.194
3400	V	21.29	21.85	22.40	22.94	23.47	24.00	24.52	25.04	25.55	26.06	26.56
	H	1048.	1078.	1108.	1137.	1168.	1198.	1229.	1260.	1291.	1323.	1354.
	S	2.689	2.741	2.793	2.843	2.894	2.944	2.994	3.043	3.092	3.141	3.189
3500	V	20.62	21.16	21.70	22.23	22.75	23.27	23.78	24.28	24.78	25.28	25.77
	H	1047.	1077.	1107.	1137.	1167.	1197.	1228.	1259.	1290.	1322.	1354.
	S	2.684	2.736	2.787	2.838	2.889	2.939	2.989	3.038	3.087	3.136	3.184
3600	V	19.98	20.52	21.04	21.56	22.07	22.57	23.07	23.57	24.06	24.54	25.02
	H	1046.	1076.	1106.	1136.	1166.	1197.	1227.	1258.	1290.	1321.	1353.
	S	2.678	2.730	2.782	2.833	2.884	2.934	2.984	3.033	3.082	3.131	3.179
3700	V	19.38	19.90	20.42	20.93	21.43	21.92	22.41	22.89	23.37	23.84	24.31
	H	1045.	1075.	1105.	1135.	1165.	1196.	1227.	1258.	1289.	1320.	1352.
	S	2.673	2.725	2.777	2.828	2.879	2.929	2.979	3.028	3.077	3.126	3.174
3800	V	18.81	19.32	19.83	20.33	20.82	21.30	21.78	22.25	22.72	23.19	23.64
	H	1044.	1074.	1104.	1134.	1164.	1195.	1226.	1257.	1288.	1320.	1352.
	S	2.668	2.720	2.772	2.823	2.874	2.924	2.974	3.023	3.072	3.121	3.170
3900	V	18.27	18.78	19.27	19.76	20.24	20.72	21.18	21.65	22.11	22.56	23.01
	H	1043.	1073.	1103.	1133.	1163.	1194.	1225.	1256.	1287.	1319.	1351.
	S	2.663	2.715	2.767	2.818	2.869	2.919	2.969	3.019	3.068	3.117	3.165
4000	V	17.76	18.25	18.74	19.22	19.69	20.16	20.62	21.07	21.52	21.97	22.41
	H	1042.	1072.	1102.	1132.	1163.	1193.	1224.	1255.	1287.	1318.	1350.
	S	2.658	2.710	2.762	2.813	2.864	2.915	2.965	3.014	3.063	3.112	3.161
4100	V	17.27	17.76	18.24	18.71	19.17	19.63	20.08	20.53	20.97	21.40	21.84
	H	1041.	1071.	1101.	1131.	1162.	1192.	1223.	1255.	1286.	1318.	1350.
	S	2.653	2.705	2.757	2.808	2.859	2.910	2.960	3.010	3.059	3.108	3.156

∞
∞

Table 12 (Continued)
Temperature range: 290 to 390°C

P	T	290	300	310	320	330	340	350	360	370	380	390
4200	V	16.81	17.29	17.76	18.22	18.68	19.12	19.57	20.01	20.44	20.87	21.29
	H	1040.	1070.	1100.	1130.	1161.	1192.	1223.	1254.	1285.	1317.	1349.
	S	2.648	2.700	2.752	2.804	2.855	2.905	2.956	3.005	3.055	3.104	3.152
4300	V	16.36	16.84	17.30	17.76	18.20	18.64	19.08	19.51	19.93	20.35	20.77
	H	1039.	1069.	1099.	1129.	1160.	1191.	1222.	1253.	1285.	1316.	1348.
	S	2.643	2.696	2.748	2.799	2.850	2.901	2.951	3.001	3.050	3.099	3.148
4400	V	15.94	16.41	16.86	17.31	17.75	18.19	18.61	19.04	19.45	19.87	20.28
	H	1038.	1068.	1098.	1129.	1159.	1190.	1221.	1252.	1284.	1316.	1348.
	S	2.638	2.691	2.743	2.795	2.846	2.897	2.947	2.997	3.046	3.095	3.144
4500	V	15.54	16.00	16.45	16.89	17.32	17.75	18.17	18.58	19.00	19.40	19.80
	H	1037.	1067.	1097.	1128.	1158.	1189.	1220.	1252.	1283.	1315.	1347.
	S	2.634	2.686	2.739	2.790	2.842	2.892	2.943	2.993	3.042	3.091	3.140
4600	V	15.16	15.61	16.05	16.48	16.91	17.33	17.74	18.15	18.56	18.96	19.35
	H	1036.	1066.	1096.	1127.	1157.	1188.	1219.	1251.	1282.	1314.	1346.
	S	2.629	2.682	2.734	2.786	2.837	2.888	2.939	2.988	3.038	3.087	3.136
4700	V	14.79	15.23	15.67	16.10	16.52	16.93	17.34	17.74	18.14	18.53	18.92
	H	1035.	1065.	1095.	1126.	1157.	1187.	1219.	1250.	1282.	1314.	1346.
	S	2.624	2.677	2.730	2.782	2.833	2.884	2.934	2.984	3.034	3.083	3.132
4800	V	14.43	14.87	15.30	15.73	16.14	16.55	16.95	17.34	17.74	18.12	18.50
	H	1034.	1064.	1094.	1125.	1156.	1187.	1218.	1249.	1281.	1313.	1345.
	S	2.620	2.673	2.726	2.778	2.829	2.880	2.930	2.980	3.030	3.079	3.128
4900	V	14.10	14.53	14.96	15.37	15.78	16.18	16.58	16.97	17.35	17.73	18.11
	H	1033.	1063.	1093.	1124.	1155.	1186.	1217.	1249.	1280.	1312.	1344.
	S	2.616	2.669	2.721	2.773	2.825	2.876	2.927	2.977	3.026	3.076	3.124
5000	V	13.77	14.20	14.62	15.03	15.43	15.83	16.22	16.60	16.98	17.35	17.72
	H	1032.	1062.	1092.	1123.	1154.	1185.	1216.	1248.	1279.	1311.	1344.
	S	2.611	2.665	2.717	2.769	2.821	2.872	2.923	2.973	3.022	3.072	3.121
5200	V	13.16	13.58	13.99	14.39	14.78	15.17	15.55	15.92	16.29	16.65	17.01
	H	1030.	1060.	1091.	1121.	1152.	1183.	1215.	1246.	1278.	1310.	1342.
	S	2.603	2.656	2.709	2.761	2.813	2.864	2.915	2.965	3.015	3.064	3.113
5400	V	12.60	13.01	13.41	13.80	14.18	14.55	14.92	15.29	15.64	16.00	16.34
	H	1027.	1058.	1089.	1119.	1151.	1182.	1213.	1245.	1277.	1309.	1341.
	S	2.594	2.648	2.701	2.754	2.805	2.857	2.908	2.958	3.008	3.057	3.106
5600	V	12.08	12.48	12.87	13.25	13.62	13.99	14.35	14.70	15.05	15.39	15.73
	H	1025.	1056.	1087.	1118.	1149.	1180.	1212.	1243.	1275.	1307.	1340.
	S	2.586	2.640	2.693	2.746	2.798	2.849	2.900	2.951	3.001	3.050	3.100
5800	V	11.60	11.99	12.37	12.74	13.10	13.46	13.81	14.15	14.49	14.83	15.16
	H	1023.	1054.	1085.	1116.	1147.	1178.	1210.	1242.	1274.	1306.	1338.
	S	2.578	2.632	2.686	2.739	2.791	2.842	2.893	2.944	2.994	3.044	3.093

Table 12 (Continued)
Temperature range: 290 to 390°C

P	T	290	300	310	320	330	340	350	360	370	380	390
6000	V	11.15	11.53	11.90	12.27	12.62	12.97	13.31	13.65	13.98	14.30	14.63
	H	1021.	1052.	1083.	1114.	1145.	1177.	1208.	1240.	1272.	1305.	1337.
	S	2.570	2.625	2.678	2.731	2.784	2.835	2.887	2.937	2.987	3.037	3.086
6200	V	10.73	11.10	11.47	11.82	12.17	12.51	12.85	13.17	13.50	13.82	14.13
	H	1019.	1050.	1081.	1112.	1144.	1175.	1207.	1239.	1271.	1303.	1336.
	S	2.562	2.617	2.671	2.724	2.777	2.828	2.880	2.931	2.981	3.031	3.080
6400	V	10.33	10.70	11.06	11.41	11.75	12.08	12.41	12.73	13.05	13.36	13.66
	H	1017.	1048.	1079.	1110.	1142.	1174.	1205.	1237.	1269.	1302.	1334.
	S	2.555	2.610	2.664	2.717	2.770	2.822	2.873	2.924	2.975	3.024	3.074
6600	V	9.968	10.33	10.68	11.02	11.36	11.68	12.00	12.32	12.63	12.93	13.23
	H	1014.	1046.	1077.	1109.	1140.	1172.	1204.	1236.	1268.	1300.	1333.
	S	2.547	2.603	2.657	2.710	2.763	2.815	2.867	2.918	2.968	3.018	3.068
6800	V	9.625	9.980	10.32	10.66	10.99	11.31	11.62	11.93	12.23	12.53	12.82
	H	1012.	1044.	1075.	1107.	1138.	1170.	1202.	1234.	1267.	1299.	1332.
	S	2.540	2.596	2.650	2.704	2.757	2.809	2.861	2.912	2.962	3.012	3.062
7000	V	9.303	9.652	9.990	10.32	10.64	10.95	11.26	11.56	11.86	12.15	12.44
	H	1010.	1042.	1073.	1105.	1137.	1169.	1201.	1233.	1265.	1298.	1330.
	S	2.533	2.589	2.643	2.697	2.750	2.803	2.854	2.906	2.956	3.007	3.056
7500	V	8.579	8.913	9.237	9.552	9.858	10.16	10.45	10.74	11.02	11.29	11.57
	H	1005.	1037.	1069.	1101.	1133.	1165.	1197.	1229.	1262.	1294.	1327.
	S	2.516	2.572	2.627	2.681	2.735	2.788	2.840	2.891	2.942	2.993	3.042
8000	V	7.956	8.276	8.586	8.887	9.180	9.466	9.746	10.02	10.29	10.55	10.81
	H	999.6	1032.	1064.	1096.	1128.	1161.	1193.	1226.	1258.	1291.	1324.
	S	2.499	2.556	2.611	2.666	2.720	2.773	2.825	2.877	2.928	2.979	3.029
8500	V	7.416	7.723	8.020	8.309	8.590	8.863	9.131	9.393	9.650	9.902	10.15
	H	994.5	1027.	1059.	1092.	1124.	1157.	1189.	1222.	1255.	1288.	1321.
	S	2.483	2.540	2.596	2.652	2.706	2.759	2.812	2.864	2.915	2.966	3.017
9000	V	6.946	7.240	7.525	7.801	8.071	8.334	8.590	8.841	9.088	9.329	9.567
	H	989.5	1022.	1055.	1088.	1120.	1153.	1186.	1219.	1252.	1285.	1318.
	S	2.468	2.526	2.582	2.638	2.692	2.746	2.799	2.851	2.903	2.954	3.005
10000	V	6.172	6.442	6.704	6.959	7.207	7.449	7.686	7.918	8.145	8.368	8.587
	H	979.9	1013.	1046.	1079.	1112.	1146.	1179.	1212.	1245.	1279.	1312.
	S	2.439	2.498	2.555	2.611	2.667	2.721	2.775	2.827	2.880	2.931	2.982
11000	V	5.571	5.817	6.058	6.292	6.522	6.746	6.965	7.179	7.390	7.597	7.800
	H	971.1	1005.	1038.	1072.	1105.	1139.	1172.	1205.	1239.	1273.	1306.
	S	2.413	2.472	2.530	2.587	2.643	2.698	2.752	2.805	2.858	2.910	2.961
12000	V	5.097	5.322	5.542	5.758	5.970	6.177	6.380	6.579	6.775	6.967	7.156
	H	963.0	997.0	1031.	1065.	1098.	1132.	1166.	1199.	1233.	1267.	1301.
	S	2.389	2.449	2.508	2.565	2.621	2.677	2.731	2.785	2.838	2.890	2.942

Table 12 (Continued)
Temperature range: 290 to 390°C

P	T	290	300	310	320	330	340	350	360	370	380	390
13000	V	4.719	4.923	5.125	5.324	5.519	5.711	5.900	6.085	6.267	6.447	6.623
	H	955.7	989.9	1024.	1058.	1092.	1126.	1160.	1194.	1228.	1262.	1296.
	S	2.368	2.428	2.487	2.545	2.601	2.657	2.712	2.766	2.819	2.872	2.924
14000	V	4.412	4.599	4.784	4.966	5.147	5.325	5.500	5.673	5.843	6.010	6.176
	H	949.3	983.5	1018.	1052.	1086.	1120.	1154.	1188.	1222.	1257.	1291.
	S	2.348	2.408	2.468	2.526	2.583	2.639	2.694	2.748	2.802	2.854	2.907
15000	V	4.160	4.331	4.501	4.669	4.836	5.001	5.164	5.326	5.484	5.641	5.796
	H	943.5	977.8	1012.	1046.	1080.	1115.	1149.	1183.	1218.	1252.	1286.
	S	2.330	2.391	2.450	2.508	2.565	2.622	2.677	2.732	2.785	2.838	2.891
16000	V	3.951	4.107	4.264	4.419	4.574	4.728	4.880	5.030	5.179	5.326	5.471
	H	938.3	972.6	1007.	1041.	1076.	1110.	1144.	1179.	1213.	1248.	1282.
	S	2.314	2.374	2.434	2.492	2.549	2.606	2.661	2.716	2.770	2.823	2.876
17000	V	3.774	3.918	4.063	4.207	4.351	4.494	4.636	4.777	4.916	5.054	5.191
	H	933.7	968.0	1002.	1037.	1071.	1105.	1140.	1174.	1209.	1243.	1278.
	S	2.299	2.359	2.419	2.477	2.534	2.591	2.647	2.702	2.756	2.809	2.862
18000	V	3.623	3.757	3.891	4.025	4.159	4.292	4.425	4.557	4.688	4.818	4.947
	H	929.6	963.9	998.2	1033.	1067.	1101.	1136.	1170.	1205.	1240.	1275.
	S	2.285	2.345	2.405	2.463	2.521	2.577	2.633	2.688	2.742	2.796	2.849
19000	V	3.493	3.617	3.742	3.867	3.992	4.117	4.242	4.366	4.489	4.612	4.733
	H	926.0	960.2	994.5	1029.	1063.	1098.	1132.	1167.	1201.	1236.	1271.
	S	2.272	2.333	2.392	2.450	2.508	2.564	2.620	2.675	2.730	2.783	2.836
20000	V	3.380	3.495	3.612	3.729	3.846	3.964	4.081	4.198	4.314	4.430	4.545
	H	922.7	956.9	991.1	1025.	1060.	1094.	1129.	1163.	1198.	1233.	1268.
	S	2.260	2.321	2.380	2.438	2.496	2.552	2.608	2.663	2.718	2.771	2.824
21000	V	3.281	3.388	3.497	3.607	3.718	3.828	3.939	4.049	4.159	4.269	4.378
	H	915.8	953.9	988.1	1022.	1057.	1091.	1126.	1160.	1195.	1230.	1265.
	S	2.249	2.309	2.368	2.427	2.484	2.541	2.597	2.652	2.706	2.760	2.813
22000	V	3.193	3.293	3.396	3.499	3.604	3.708	3.813	3.917	4.021	4.125	4.229
	H	917.3	951.2	985.3	1020.	1054.	1088.	1123.	1158.	1192.	1227.	1262.
	S	2.239	2.299	2.358	2.416	2.473	2.530	2.586	2.641	2.696	2.750	2.803
23000	V	3.114	3.209	3.305	3.403	3.501	3.600	3.699	3.799	3.898	3.996	4.095
	H	915.0	948.8	982.8	1017.	1051.	1086.	1120.	1155.	1190.	1225.	1260.
	S	2.229	2.289	2.348	2.406	2.463	2.520	2.576	2.631	2.686	2.739	2.793
24000	V	3.044	3.133	3.224	3.316	3.409	3.503	3.598	3.692	3.786	3.880	3.974
	H	912.9	946.7	980.6	1015.	1049.	1083.	1118.	1153.	1187.	1222.	1257.
	S	2.220	2.280	2.338	2.396	2.454	2.510	2.566	2.621	2.676	2.730	2.783
25000	V	2.981	3.065	3.150	3.238	3.326	3.416	3.505	3.595	3.685	3.775	3.865
	H	911.1	944.7	978.6	1013.	1047.	1081.	1116.	1150.	1185.	1220.	1255.
	S	2.212	2.271	2.329	2.387	2.445	2.501	2.557	2.612	2.667	2.721	2.774

Table 12 (Continued)
Temperature range: 400 to 500°C

P	T	400	410	420	430	440	450	460	470	480	490	500
5	V	19260.	19540.	19830.	20120.	20400.	20690.	20970.	21260.	21550.	21830.	22120.
	H	1408.	1440.	1472.	1504.	1537.	1569.	1602.	1636.	1669.	1703.	1737.
	S	4.195	4.242	4.288	4.335	4.380	4.426	4.471	4.517	4.562	4.606	4.651
50	V	1920.	1950.	1980.	2010.	2040.	2070.	2100.	2130.	2150.	2180.	2210.
	H	1408.	1440.	1472.	1504.	1536.	1569.	1602.	1636.	1669.	1703.	1737.
	S	3.866	3.912	3.959	4.005	4.051	4.096	4.142	4.187	4.232	4.277	4.321
100	V	961.5	975.9	990.3	1000.	1020.	1030.	1050.	1060.	1080.	1090.	1110.
	H	1408.	1439.	1471.	1504.	1536.	1569.	1602.	1635.	1669.	1703.	1737.
	S	3.766	3.813	3.859	3.905	3.951	3.997	4.042	4.088	4.133	4.177	4.222
101.33	V	948.9	963.1	977.3	991.4	1010.	1020.	1030.	1050.	1060.	1080.	1090.
	H	1408.	1439.	1471.	1504.	1536.	1569.	1602.	1635.	1669.	1703.	1737.
	S	3.764	3.811	3.857	3.904	3.949	3.995	4.041	4.086	4.131	4.175	4.220
200	V	480.1	487.3	494.5	501.7	508.9	516.2	523.4	530.6	537.8	545.0	552.2
	H	1407.	1439.	1471.	1503.	1535.	1568.	1601.	1635.	1668.	1702.	1736.
	S	3.666	3.713	3.759	3.806	3.852	3.897	3.943	3.988	4.033	4.078	4.122
300	V	319.6	324.4	329.2	334.1	338.9	343.8	348.6	353.4	358.2	363.1	367.9
	H	1406.	1438.	1470.	1502.	1535.	1568.	1601.	1634.	1668.	1702.	1736.
	S	3.608	3.654	3.701	3.747	3.793	3.839	3.884	3.929	3.974	4.019	4.064
400	V	239.3	243.0	246.6	250.3	253.9	257.6	261.2	264.8	268.5	272.1	275.7
	H	1406.	1438.	1470.	1502.	1534.	1567.	1600.	1634.	1667.	1701.	1735.
	S	3.566	3.613	3.659	3.705	3.751	3.797	3.842	3.888	3.933	3.977	4.022
500	V	191.2	194.1	197.1	200.0	202.9	205.8	208.8	211.7	214.6	217.5	220.4
	H	1405.	1437.	1469.	1501.	1534.	1567.	1600.	1633.	1667.	1701.	1735.
	S	3.533	3.580	3.626	3.673	3.719	3.764	3.810	3.855	3.900	3.945	3.989
600	V	159.1	161.5	164.0	166.5	168.9	171.4	173.8	176.2	178.7	181.1	183.6
	H	1405.	1436.	1468.	1501.	1533.	1566.	1599.	1633.	1666.	1700.	1734.
	S	3.506	3.553	3.600	3.646	3.692	3.738	3.783	3.828	3.873	3.918	3.963
700	V	136.2	138.3	140.4	142.5	144.6	146.7	148.8	150.9	153.0	155.1	157.2
	H	1404.	1436.	1468.	1500.	1533.	1565.	1599.	1632.	1666.	1700.	1734.
	S	3.483	3.530	3.577	3.623	3.669	3.715	3.761	3.806	3.851	3.896	3.940
800	V	119.0	120.8	122.7	124.6	126.4	128.3	130.1	132.0	133.8	135.6	137.5
	H	1403.	1435.	1467.	1499.	1532.	1565.	1598.	1632.	1665.	1699.	1733.
	S	3.464	3.510	3.557	3.603	3.649	3.695	3.741	3.786	3.831	3.876	3.921
900	V	105.6	107.3	108.9	110.6	112.2	113.9	115.5	117.2	118.8	120.5	122.1
	H	1403.	1434.	1466.	1499.	1531.	1564.	1598.	1631.	1665.	1699.	1733.
	S	3.446	3.493	3.540	3.586	3.632	3.678	3.723	3.769	3.814	3.859	3.903
1000	V	94.91	96.42	97.92	99.42	100.9	102.4	103.9	105.4	106.9	108.4	109.9
	H	1402.	1434.	1466.	1498.	1531.	1564.	1597.	1630.	1664.	1698.	1732.
	S	3.430	3.477	3.524	3.570	3.616	3.662	3.708	3.753	3.798	3.843	3.888

Table 12 (Continued)
Temperature range: 400 to 500°C

P	T	400	410	420	430	440	450	460	470	480	490	500
1200	V	78.87	80.14	81.40	82.66	83.92	85.18	86.43	87.68	88.93	90.18	91.43
	H	1401.	1433.	1465.	1497.	1530.	1563.	1596.	1629.	1663.	1697.	1731.
	S	3.403	3.450	3.496	3.543	3.589	3.635	3.680	3.726	3.771	3.816	3.860
1400	V	67.42	68.51	69.61	70.70	71.79	72.87	73.96	75.04	76.12	77.20	78.27
	H	1399.	1431.	1463.	1496.	1529.	1562.	1595.	1628.	1662.	1696.	1731.
	S	3.379	3.426	3.473	3.519	3.566	3.611	3.657	3.703	3.748	3.793	3.837
1600	V	58.83	59.80	60.76	61.73	62.69	63.65	64.60	65.56	66.51	67.46	68.41
	H	1398.	1430.	1462.	1495.	1527.	1560.	1594.	1627.	1661.	1695.	1730.
	S	3.358	3.406	3.452	3.499	3.545	3.591	3.637	3.682	3.727	3.772	3.817
1800	V	52.15	53.02	53.89	54.75	55.61	56.47	57.33	58.19	59.04	59.89	60.74
	H	1397.	1429.	1461.	1493.	1526.	1559.	1593.	1626.	1660.	1694.	1729.
	S	3.340	3.387	3.434	3.481	3.527	3.573	3.619	3.664	3.709	3.754	3.799
2000	V	46.81	47.60	48.39	49.17	49.96	50.74	51.51	52.29	53.06	53.83	54.60
	H	1395.	1427.	1460.	1492.	1525.	1558.	1592.	1625.	1659.	1693.	1728.
	S	3.324	3.371	3.418	3.464	3.511	3.557	3.602	3.648	3.693	3.738	3.783
2100	V	44.52	45.28	46.03	46.78	47.53	48.28	49.02	49.76	50.50	51.24	51.98
	H	1395.	1427.	1459.	1492.	1525.	1558.	1591.	1625.	1659.	1693.	1727.
	S	3.316	3.363	3.410	3.457	3.503	3.549	3.595	3.640	3.686	3.731	3.776
2200	V	42.44	43.17	43.89	44.61	45.33	46.04	46.76	47.47	48.18	48.88	49.59
	H	1394.	1426.	1459.	1491.	1524.	1557.	1590.	1624.	1658.	1692.	1727.
	S	3.308	3.356	3.403	3.449	3.496	3.542	3.588	3.633	3.679	3.724	3.768
2300	V	40.55	41.24	41.94	42.63	43.32	44.01	44.69	45.37	46.05	46.73	47.41
	H	1394.	1426.	1458.	1491.	1523.	1557.	1590.	1624.	1658.	1692.	1726.
	S	3.301	3.348	3.395	3.442	3.489	3.535	3.581	3.626	3.672	3.717	3.761
2400	V	38.81	39.48	40.15	40.81	41.48	42.14	42.80	43.45	44.11	44.76	45.41
	H	1393.	1425.	1457.	1490.	1523.	1556.	1589.	1623.	1657.	1691.	1726.
	S	3.294	3.342	3.389	3.435	3.482	3.528	3.574	3.620	3.665	3.710	3.755
2500	V	37.21	37.86	38.50	39.14	39.78	40.42	41.05	41.69	42.32	42.94	43.57
	H	1392.	1424.	1457.	1489.	1522.	1555.	1589.	1623.	1657.	1691.	1725.
	S	3.288	3.335	3.382	3.429	3.475	3.522	3.567	3.613	3.658	3.704	3.748
2600	V	35.73	36.36	36.98	37.60	38.22	38.83	39.45	40.06	40.66	41.27	41.88
	H	1392.	1424.	1456.	1489.	1522.	1555.	1588.	1622.	1656.	1690.	1725.
	S	3.281	3.329	3.376	3.423	3.469	3.515	3.561	3.607	3.652	3.697	3.742
2700	V	34.36	34.97	35.57	36.17	36.77	37.36	37.96	38.55	39.13	39.72	40.31
	H	1391.	1423.	1455.	1488.	1521.	1554.	1588.	1622.	1655.	1690.	1724.
	S	3.275	3.323	3.370	3.417	3.463	3.509	3.555	3.601	3.646	3.691	3.736
2800	V	33.10	33.68	34.27	34.85	35.43	36.00	36.57	37.15	37.72	38.28	38.85
	H	1390.	1422.	1455.	1488.	1521.	1554.	1587.	1621.	1655.	1689.	1724.
	S	3.269	3.317	3.364	3.411	3.457	3.503	3.549	3.595	3.641	3.686	3.731

Table 12 (Continued)
Temperature range: 400 to 500°C

P	T	400	410	420	430	440	450	460	470	480	490	500
2900	V	31.92	32.48	33.05	33.61	34.17	34.73	35.29	35.84	36.39	36.94	37.49
	H	1390.	1422.	1454.	1487.	1520.	1553.	1587.	1620.	1654.	1689.	1723.
	S	3.263	3.311	3.358	3.405	3.452	3.498	3.544	3.590	3.635	3.680	3.725
3000	V	30.81	31.37	31.92	32.46	33.01	33.55	34.09	34.63	35.16	35.69	36.23
	H	1389.	1421.	1454.	1486.	1519.	1553.	1586.	1620.	1654.	1688.	1723.
	S	3.256	3.305	3.353	3.399	3.446	3.492	3.538	3.584	3.630	3.675	3.720
3100	V	29.78	30.32	30.86	31.39	31.92	32.44	32.97	33.49	34.01	34.53	35.04
	H	1388.	1421.	1453.	1486.	1519.	1552.	1586.	1619.	1653.	1688.	1722.
	S	3.252	3.300	3.347	3.394	3.441	3.487	3.533	3.579	3.624	3.670	3.714
3200	V	28.82	29.34	29.86	30.38	30.89	31.41	31.91	32.42	32.93	33.43	33.93
	H	1388.	1420.	1452.	1485.	1518.	1552.	1585.	1619.	1653.	1687.	1722.
	S	3.247	3.295	3.342	3.389	3.435	3.482	3.528	3.574	3.619	3.664	3.709
3300	V	27.91	28.42	28.93	29.43	29.93	30.43	30.93	31.42	31.91	32.40	32.89
	H	1387.	1419.	1452.	1485.	1518.	1551.	1585.	1618.	1652.	1687.	1721.
	S	3.242	3.289	3.337	3.384	3.430	3.477	3.523	3.569	3.614	3.659	3.704
3400	V	27.06	27.56	28.05	28.54	29.03	29.51	30.00	30.48	30.96	31.44	31.91
	H	1386.	1419.	1451.	1484.	1517.	1550.	1584.	1618.	1652.	1686.	1721.
	S	3.237	3.284	3.332	3.379	3.425	3.472	3.518	3.564	3.609	3.655	3.700
3500	V	26.26	26.74	27.22	27.70	28.18	28.65	29.12	29.59	30.06	30.52	30.99
	H	1386.	1418.	1451.	1483.	1517.	1550.	1584.	1617.	1651.	1686.	1720.
	S	3.232	3.280	3.327	3.374	3.421	3.467	3.513	3.559	3.605	3.650	3.695
3600	V	25.50	25.97	26.44	26.91	27.37	27.84	28.30	28.75	29.21	29.66	30.11
	H	1385.	1417.	1450.	1483.	1516.	1549.	1583.	1617.	1651.	1685.	1720.
	S	3.227	3.275	3.322	3.369	3.416	3.462	3.509	3.554	3.600	3.645	3.690
3700	V	24.78	25.24	25.70	26.16	26.61	27.06	27.51	27.96	28.41	28.85	29.29
	H	1384.	1417.	1449.	1482.	1515.	1549.	1582.	1616.	1650.	1685.	1719.
	S	3.222	3.270	3.318	3.365	3.411	3.458	3.504	3.550	3.596	3.641	3.686
3800	V	24.10	24.55	25.00	25.45	25.89	26.33	26.77	27.21	27.64	28.08	28.51
	H	1384.	1416.	1449.	1482.	1515.	1548.	1582.	1616.	1650.	1684.	1719.
	S	3.218	3.266	3.313	3.360	3.407	3.453	3.500	3.546	3.591	3.637	3.682
3900	V	23.46	23.90	24.34	24.78	25.21	25.64	26.07	26.50	26.92	27.35	27.77
	H	1383.	1416.	1448.	1481.	1514.	1548.	1581.	1615.	1649.	1684.	1718.
	S	3.213	3.261	3.309	3.356	3.403	3.449	3.495	3.541	3.587	3.632	3.677
4000	V	22.85	23.28	23.71	24.14	24.56	24.99	25.41	25.82	26.24	26.65	27.06
	H	1382.	1415.	1448.	1481.	1514.	1547.	1581.	1615.	1649.	1683.	1718.
	S	3.209	3.257	3.304	3.351	3.398	3.445	3.491	3.537	3.583	3.628	3.673
4100	V	22.26	22.69	23.11	23.53	23.95	24.36	24.77	25.18	25.59	25.99	26.40
	H	1382.	1414.	1447.	1480.	1513.	1547.	1580.	1614.	1648.	1683.	1718.
	S	3.205	3.252	3.300	3.347	3.394	3.441	3.487	3.533	3.579	3.624	3.669

Table 12 (Continued)
Temperature range: 400 to 500°C

P	T	400	410	420	430	440	450	460	470	480	490	500
4200	V	21.71	22.13	22.54	22.95	23.36	23.77	24.17	24.57	24.97	25.36	25.76
	H	1381.	1414.	1446.	1479.	1513.	1546.	1580.	1614.	1648.	1682.	1717.
	S	3.200	3.248	3.296	3.343	3.390	3.437	3.483	3.529	3.575	3.620	3.665
4300	V	21.18	21.59	22.00	22.40	22.80	23.20	23.59	23.99	24.38	24.76	25.15
	H	1381.	1413.	1446.	1479.	1512.	1546.	1579.	1613.	1647.	1682.	1717.
	S	3.196	3.244	3.292	3.339	3.386	3.433	3.479	3.525	3.571	3.616	3.661
4400	V	20.68	21.08	21.48	21.88	22.27	22.66	23.04	23.43	23.81	24.19	24.57
	H	1380.	1412.	1445.	1478.	1511.	1545.	1579.	1613.	1647.	1681.	1716.
	S	3.192	3.240	3.288	3.335	3.382	3.429	3.475	3.521	3.567	3.612	3.657
4500	V	20.20	20.59	20.99	21.37	21.76	22.14	22.52	22.90	23.27	23.65	24.02
	H	1379.	1412.	1445.	1478.	1511.	1544.	1578.	1612.	1646.	1681.	1716.
	S	3.188	3.236	3.284	3.331	3.378	3.425	3.471	3.517	3.563	3.609	3.654
4600	V	19.74	20.13	20.51	20.89	21.27	21.65	22.02	22.39	22.76	23.13	23.49
	H	1379.	1411.	1444.	1477.	1510.	1544.	1578.	1612.	1646.	1680.	1715.
	S	3.184	3.232	3.280	3.327	3.374	3.421	3.467	3.514	3.559	3.605	3.650
4700	V	19.30	19.68	20.06	20.43	20.81	21.17	21.54	21.90	22.27	22.63	22.98
	H	1378.	1411.	1443.	1476.	1510.	1543.	1577.	1611.	1645.	1680.	1715.
	S	3.180	3.228	3.276	3.324	3.371	3.417	3.464	3.510	3.556	3.601	3.646
4800	V	18.88	19.26	19.63	19.99	20.36	20.72	21.08	21.44	21.79	22.15	22.50
	H	1377.	1410.	1443.	1476.	1509.	1543.	1577.	1611.	1645.	1680.	1714.
	S	3.177	3.225	3.272	3.320	3.367	3.414	3.460	3.506	3.552	3.598	3.643
4900	V	18.48	18.85	19.21	19.57	19.93	20.29	20.64	20.99	21.34	21.69	22.04
	H	1377.	1409.	1442.	1475.	1509.	1542.	1576.	1610.	1644.	1679.	1714.
	S	3.173	3.221	3.269	3.316	3.363	3.410	3.457	3.503	3.549	3.594	3.639
5000	V	18.09	18.45	18.81	19.17	19.52	19.87	20.22	20.57	20.91	21.25	21.59
	H	1376.	1409.	1442.	1475.	1508.	1542.	1576.	1610.	1644.	1679.	1713.
	S	3.169	3.217	3.265	3.313	3.360	3.407	3.453	3.499	3.545	3.591	3.636
5200	V	17.36	17.71	18.06	18.41	18.75	19.09	19.42	19.76	20.09	20.42	20.75
	H	1375.	1407.	1440.	1474.	1507.	1541.	1575.	1609.	1643.	1678.	1712.
	S	3.162	3.210	3.258	3.306	3.353	3.400	3.446	3.492	3.538	3.584	3.629
5400	V	16.69	17.03	17.37	17.70	18.03	18.36	18.69	19.01	19.34	19.66	19.97
	H	1373.	1406.	1439.	1472.	1506.	1540.	1574.	1608.	1642.	1677.	1712.
	S	3.155	3.203	3.251	3.299	3.346	3.393	3.440	3.486	3.532	3.578	3.623
5600	V	16.06	16.40	16.72	17.05	17.37	17.69	18.01	18.32	18.63	18.95	19.25
	H	1372.	1405.	1438.	1471.	1505.	1539.	1572.	1607.	1641.	1676.	1711.
	S	3.148	3.197	3.245	3.292	3.340	3.387	3.433	3.480	3.526	3.571	3.617
5800	V	15.48	15.81	16.13	16.44	16.76	17.07	17.37	17.68	17.98	18.28	18.58
	H	1371.	1404.	1437.	1470.	1504.	1537.	1571.	1606.	1640.	1675.	1710.
	S	3.142	3.190	3.238	3.286	3.333	3.380	3.427	3.473	3.519	3.565	3.611

Table 12 (Continued)
Temperature range: 400 to 500°C

P	T	400	410	420	430	440	450	460	470	480	490	500
6000	V	14.94	15.26	15.57	15.88	16.18	16.48	16.78	17.08	17.38	17.67	17.96
	H	1370.	1403.	1436.	1469.	1503.	1536.	1570.	1605.	1639.	1674.	1709.
	S	3.135	3.184	3.232	3.280	3.327	3.374	3.421	3.467	3.513	3.559	3.605
6200	V	14.44	14.75	15.05	15.35	15.65	15.94	16.23	16.52	16.81	17.09	17.38
	H	1368.	1401.	1435.	1468.	1502.	1535.	1569.	1604.	1638.	1673.	1708.
	S	3.129	3.178	3.226	3.274	3.321	3.368	3.415	3.462	3.508	3.553	3.599
6400	V	13.97	14.27	14.56	14.85	15.14	15.43	15.71	16.00	16.28	16.55	16.83
	H	1367.	1400.	1433.	1467.	1500.	1534.	1568.	1603.	1637.	1672.	1707.
	S	3.123	3.172	3.220	3.268	3.315	3.362	3.409	3.456	3.502	3.548	3.593
6600	V	13.52	13.82	14.10	14.39	14.67	14.95	15.23	15.51	15.78	16.05	16.32
	H	1366.	1399.	1432.	1466.	1499.	1533.	1567.	1602.	1636.	1671.	1706.
	S	3.117	3.166	3.214	3.262	3.310	3.357	3.404	3.450	3.496	3.542	3.588
6800	V	13.11	13.39	13.68	13.95	14.23	14.50	14.77	15.04	15.31	15.57	15.84
	H	1365.	1398.	1431.	1465.	1498.	1532.	1566.	1601.	1635.	1670.	1705.
	S	3.111	3.160	3.208	3.256	3.304	3.351	3.398	3.445	3.491	3.537	3.583
7000	V	12.72	13.00	13.27	13.55	13.81	14.08	14.35	14.61	14.87	15.13	15.38
	H	1363.	1397.	1430.	1463.	1497.	1531.	1565.	1600.	1634.	1669.	1704.
	S	3.106	3.154	3.203	3.251	3.299	3.346	3.393	3.440	3.486	3.532	3.578
7500	V	11.83	12.10	12.36	12.62	12.87	13.13	13.38	13.63	13.87	14.12	14.36
	H	1360.	1394.	1427.	1461.	1495.	1529.	1563.	1597.	1632.	1667.	1702.
	S	3.092	3.141	3.190	3.238	3.286	3.333	3.380	3.427	3.473	3.519	3.565
8000	V	11.07	11.32	11.57	11.81	12.06	12.30	12.53	12.77	13.00	13.23	13.46
	H	1357.	1391.	1424.	1458.	1492.	1526.	1561.	1595.	1630.	1665.	1700.
	S	3.079	3.128	3.177	3.225	3.273	3.321	3.368	3.415	3.461	3.508	3.553
8500	V	10.39	10.64	10.87	11.11	11.34	11.57	11.79	12.02	12.24	12.46	12.68
	H	1354.	1388.	1422.	1455.	1489.	1524.	1558.	1593.	1628.	1663.	1698.
	S	3.067	3.116	3.165	3.213	3.261	3.309	3.356	3.403	3.450	3.496	3.542
9000	V	9.801	10.03	10.26	10.48	10.70	10.92	11.14	11.35	11.57	11.78	11.98
	H	1351.	1385.	1419.	1453.	1487.	1521.	1556.	1591.	1625.	1661.	1696.
	S	3.055	3.104	3.153	3.202	3.250	3.298	3.345	3.393	3.439	3.486	3.532
10000	V	8.803	9.015	9.224	9.430	9.634	9.835	10.03	10.23	10.43	10.62	10.81
	H	1346.	1380.	1414.	1448.	1482.	1517.	1551.	1586.	1621.	1657.	1692.
	S	3.032	3.082	3.132	3.181	3.229	3.277	3.325	3.372	3.419	3.466	3.512
11000	V	8.000	8.196	8.390	8.581	8.770	8.956	9.141	9.323	9.503	9.682	9.858
	H	1340.	1374.	1408.	1443.	1477.	1512.	1547.	1582.	1617.	1653.	1688.
	S	3.012	3.062	3.112	3.161	3.210	3.258	3.306	3.353	3.400	3.447	3.493
12000	V	7.342	7.526	7.706	7.884	8.060	8.234	8.405	8.575	8.743	8.909	9.073
	H	1335.	1369.	1404.	1438.	1473.	1508.	1543.	1578.	1613.	1649.	1684.
	S	2.993	3.043	3.093	3.143	3.192	3.240	3.288	3.336	3.383	3.430	3.476

Table 12 (Continued)
Temperature range: 400 to 500°C

P	T	400	410	420	430	440	450	460	470	480	490	500
13000	V	6.797	6.968	7.137	7.303	7.468	7.630	7.791	7.949	8.106	8.262	8.416
	H	1330.	1364.	1399.	1434.	1469.	1504.	1539.	1574.	1609.	1645.	1681.
	S	2.975	3.026	3.076	3.125	3.175	3.223	3.272	3.320	3.367	3.414	3.461
14000	V	6.338	6.499	6.657	6.813	6.968	7.120	7.271	7.420	7.567	7.713	7.858
	H	1325.	1360.	1395.	1429.	1464.	1500.	1535.	1570.	1606.	1642.	1678.
	S	2.958	3.009	3.060	3.109	3.159	3.208	3.256	3.304	3.352	3.399	3.446
15000	V	5.949	6.100	6.248	6.395	6.541	6.684	6.826	6.967	7.106	7.243	7.379
	H	1321.	1356.	1391.	1425.	1461.	1496.	1531.	1567.	1603.	1638.	1674.
	S	2.943	2.994	3.044	3.094	3.144	3.193	3.242	3.290	3.338	3.385	3.432
16000	V	5.615	5.757	5.897	6.036	6.173	6.308	6.442	6.575	6.706	6.836	6.965
	H	1317.	1352.	1387.	1422.	1457.	1492.	1528.	1563.	1599.	1635.	1671.
	S	2.928	2.979	3.030	3.080	3.130	3.179	3.228	3.276	3.324	3.372	3.419
17000	V	5.326	5.460	5.592	5.723	5.853	5.981	6.108	6.234	6.358	6.481	6.604
	H	1313.	1348.	1383.	1418.	1453.	1489.	1525.	1560.	1596.	1632.	1669.
	S	2.914	2.966	3.016	3.067	3.117	3.166	3.215	3.263	3.311	3.359	3.406
18000	V	5.075	5.201	5.326	5.450	5.573	5.695	5.815	5.934	6.052	6.169	6.286
	H	1309.	1344.	1380.	1415.	1450.	1486.	1521.	1557.	1593.	1630.	1666.
	S	2.901	2.953	3.004	3.054	3.104	3.154	3.203	3.251	3.299	3.347	3.394
19000	V	4.854	4.974	5.092	5.210	5.326	5.442	5.556	5.670	5.782	5.893	6.004
	H	1306.	1341.	1376.	1412.	1447.	1483.	1519.	1555.	1591.	1627.	1663.
	S	2.889	2.940	2.992	3.042	3.092	3.142	3.191	3.240	3.288	3.336	3.383
20000	V	4.659	4.773	4.885	4.997	5.108	5.217	5.326	5.434	5.541	5.648	5.753
	H	1303.	1338.	1373.	1409.	1444.	1480.	1516.	1552.	1588.	1624.	1661.
	S	2.877	2.929	2.980	3.031	3.081	3.131	3.180	3.229	3.277	3.325	3.372
21000	V	4.486	4.594	4.701	4.807	4.912	5.017	5.121	5.224	5.326	5.428	5.528
	H	1300.	1335.	1371.	1406.	1442.	1477.	1513.	1549.	1586.	1622.	1659.
	S	2.866	2.918	2.969	3.020	3.070	3.120	3.169	3.218	3.267	3.315	3.362
22000	V	4.332	4.434	4.536	4.637	4.738	4.837	4.937	5.035	5.133	5.230	5.326
	H	1297.	1333.	1368.	1404.	1439.	1475.	1511.	1547.	1583.	1620.	1656.
	S	2.855	2.907	2.959	3.010	3.060	3.110	3.159	3.208	3.257	3.305	3.352
23000	V	4.193	4.291	4.388	4.484	4.580	4.676	4.770	4.864	4.958	5.051	5.143
	H	1295.	1330.	1366.	1401.	1437.	1473.	1509.	1545.	1581.	1618.	1654.
	S	2.845	2.897	2.949	3.000	3.050	3.100	3.150	3.199	3.247	3.295	3.343
24000	V	4.068	4.161	4.254	4.346	4.438	4.529	4.620	4.710	4.800	4.889	4.977
	H	1293.	1328.	1363.	1399.	1435.	1471.	1507.	1543.	1579.	1616.	1652.
	S	2.836	2.888	2.939	2.990	3.041	3.091	3.140	3.189	3.238	3.286	3.334
25000	V	3.954	4.043	4.132	4.220	4.308	4.396	4.483	4.569	4.655	4.741	4.826
	H	1290.	1326.	1361.	1397.	1433.	1469.	1505.	1541.	1577.	1614.	1651.
	S	2.827	2.879	2.930	2.981	3.032	3.082	3.131	3.181	3.229	3.277	3.325

REFERENCES

1. J. J. Martin, "Equations of State," *Ind. Eng. Chem.*, 59(12), 34-52 (1967).
2. S. L. Milora and J. W. Tester, Geothermal Energy as a Source of Electric Power, MIT Press, Cambridge, Massachusetts, 1976.
3. S. L. Milora, Application of the Martin Equation of State to the Thermodynamic Properties of Ammonia, ORNL/TM-4313 (December 1973).
4. S. L. Milora, STATEQ: A Nonlinear Least-Squares Code for Obtaining Martin Thermodynamic Representations of Fluids in the Gaseous and Dense Gaseous Regions, ORNL/TM-5115 (February 1976).
5. P. Davies, Thermodynamic Functions of Gases, Vol. 1, edited by F. Din, Butterworths Scientific Publications, London, 1956.
6. J. A. Beattie and C. K. Lawrence, "Some of the Thermodynamic Properties of Ammonia - 1. The Compressibility of and an Equation of State for Gaseous Ammonia. The Vapor Pressure of Liquid Ammonia," *J. Am. Chem. Soc.*, 52, 6-14 (1930).
7. "Tables of Thermodynamic Properties of Ammonia," Circular of the Bureau of Standards, No. 143: 1-14 (1923).
8. L. N. Canjar and F. S. Manning, Thermodynamic Properties and Reduced Correlations for Gases, Gulf Publishing Company, Houston, Texas, 1967.

INTERNAL DISTRIBUTION

- | | |
|----------------------|---------------------------------|
| 1. S. Barton | 30-44. S. L. Milora |
| 2. S. E. Beall | 45. R. W. Murphy |
| 3-12. S. K. Combs | 46. H. Postma |
| 13. W. E. Cooper | 47. R. C. Robertson |
| 14. W. B. Cottrell | 48. M. W. Rosenthal |
| 15. F. L. Culler | 49. M. R. Sheldon |
| 16. G. G. Fee | 50. I. Spiewak |
| 17. W. Fulkerson | 51. D. G. Thomas |
| 18. M. J. Goglia | 52. D. B. Trauger |
| 19. J. F. Harvey | 53. G. D. Whitman |
| 20. H. W. Hoffman | 54. W. J. Wilcox |
| 21. L. Levenson | 55-58. Central Research Library |
| 22. R. N. Lyon | 59. Document Reference Section |
| 23. R. E. MacPherson | 60-61. Laboratory Records |
| 24. G. S. Mailen | 62. Laboratory Records — RC |
| 25-29. J. W. Michel | 63. ORNL Patent Office |

EXTERNAL DISTRIBUTION

64. Director, Division of Geothermal Energy, ERDA, Washington, DC 20545
65. Assistant Director for Resource Utilization, Division of Geothermal Energy, ERDA, Washington, DC 20545
66. Assistant Director for Advanced Research & Technology, Division of Geothermal Energy, ERDA, Washington, DC 20545
67. Chief, Utilization Technology Branch, Division of Geothermal Energy, ERDA, Washington, DC 20545
68. Program Manager, Utilization Technology Branch, Division of Geothermal Energy, ERDA, Washington, DC 20545
69. R. L. Aamondt, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, NM 87544
70. A. L. Austin, L-505, Geothermal Program, Lawrence Livermore Laboratory, University of California, P.O. Box 808, Livermore CA 94550
71. Glen E. Brandvold, Sandia Laboratories, P.O. Box 5800, Albuquerque, NM 87115
72. R. B. Coryell, Geothermal Program, National Science Foundation, Washington, DC 20550
73. Michael Green, Energy and Environment Division, Lawrence Berkeley Laboratory, University of California, CA 94720
74. T. C. Hinrichs, Magma Power Company, 5143 Sunset Blvd., Los Angeles, CA 92112
75. Ivonne J. Ingvarsson, Aerojet Nuclear Company, 550 Second Street, Idaho Falls, ID 83401
76. Gerald Johnson, Bechtel Corporation, P.O. Box 3965, San Francisco, CA 94119
77. G. A. Kolstad, Division of Physical Research, ERDA, Washington, DC 20545
78. J. F. Kunze, Aerojet Nuclear Company, 550 Second Street, P.O. Box 1845, Idaho Falls, ID 83401

79. J. T. Kuwada, Rogers Engineering Company, Inc., 111 Pine Street, Sixth Floor, San Francisco, CA 94111
80. Alan D. K. Laird, Mechanical Engineering Department, University of California, Lawrence Berkeley Laboratory, Berkeley, CA 94720
81. G. W. Leonard, Code 4511, Naval Weapons Center, China Lake, CA 93555
82. A. Lundberg, L-505, University of California, Lawrence Livermore Laboratory, P.O. Box 808, Livermore, CA 94550
83. Professor J. J. Martin, Chemical Engineering Department, University of Michigan, Ann Arbor, MI 48104
84. Kenneth Mirk, Lawrence Berkeley Laboratory, University of California, Berkeley, CA 94720
85. Kevin P. Murphy, Specialty Chemicals Division, Allied Chemical Corporation, P.O. Box 1069, Buffalo, NY 14240
86. James Nugent, Geothermal Energy, San Diego Gas & Electric Company, P.O. Box 1831, San Diego, CA 92112
87. William Ogle, 3801 West 44th Avenue, Anchorage, AK 99503
88. J. J. Perona, Chemical & Metallurgical Engineering Department, University of Tennessee, Knoxville, TN 37916
89. D. R. Pitts, 876 Forest Drive, Route 12, Cookeville, TN 38501
90. Morton C. Smith, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, NM 87544
91. Kenneth E. Starling, College of Engineering, School of Chemical Engineering & Materials Science, University of Oklahoma, Norman, OK 73069
92. J. W. Tester, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, NM 87544
93. Ronald Walter, Battelle - Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352
94. Director, Research & Technical Support Division, Oak Ridge Operations Office, P.O. Box E, Oak Ridge, TN 37830
- 95-121. Technical Information Center, ERDA, P.O. Box 62, Oak Ridge, TN 37830