DEPARTMENT OF COMMERCE

CIRCULAR

OF THE

BUREAU OF STANDARDS

No. 142

TABLES OF THERMODYNAMIC PROPERTIES OF AMMONIA

(1st Edition)
APRIL 16, 1923

PRICE, 15 CENTS
Sold only by the Superintendent of Documents, Government Printing Office,
Washington, D. C.

WASHINGTON
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1923

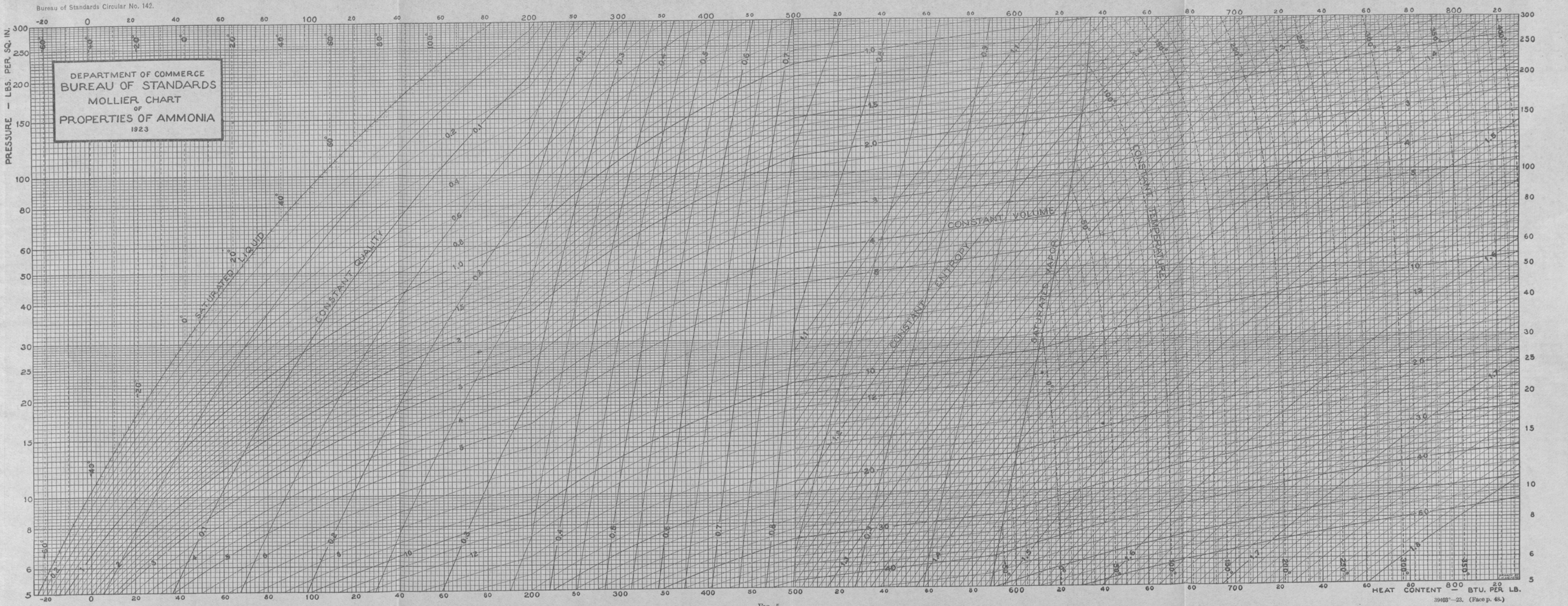

Fig. 5.

39403°—23. (Face p. 48.)

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TABLES OF THERMODYNAMIC PROPERTIES OF AMMONIA.

ABSTRACT.

These tables embody the results of an elaborate series of measurements of the thermodynamic properties of ammonia. The fundamental units and constants used in the tables are defined. The empirical equations used in computing the tables, and also the references to the publications dealing with the experimental data, are given. The tables have been prepared in the forms convenient for use in refrigerating engineering. The same data are also presented graphically in the form of a Mollier chart.

CONTENTS.

I. INTRODUCTION.

These tables are the result of measurements made by the Bureau of Standards to determine fundamental physical data of refrigerating engineering. The bureau's researches in this field were undertaken in response to the wishes of the refrigerating industry as expressed though its national associations and were specifically authorized by act of Congress.[1] The experimental work on ammonia was done during the years 1915–1917 and 1920–1922, inclusive. In carrying out the experimental program the bureau has had the benefit of the advice of The American Society of Refrigerating Engineers, one of the organizations which originally requested that the work be done, and whose cooperation made it possible to carry the program through to a successful conclusion. The results obtained are in surprisingly good agreement with the average of the few values available when the work

[1] Act approved Aug. 24, 1912 (Public No. 302).

was begun and are, in general, in excellent agreement with recent work done elsewhere.

The bureau's work on ammonia has made it possible to prepare tables based upon a homogeneous body of accurately determined and thermodynamically consistent data relating to a material of a known and high degree of purity.

In order to make these tables available at an earlier date than would otherwise have been possible, this first edition is published in foot-pound-Fahrenheit units only. Tables in metric engineering units will be published subsequently.

II. FUNDAMENTAL UNITS AND CONSTANTS.

Temperature scale.—The Fahrenheit scale used in these tables is derived from the standard centigrade scale by means of the relation

$$\text{Fahrenheit temperature} = 1.8 \times \text{centigrade temperature} + 32$$

Temperatures on the absolute Fahrenheit scale were obtained by adding 459.58° to the temperatures as defined above.

The standard centigrade scale adopted by the Bureau of Standards for the temperature interval −40 to +450° C. is the thermodynamic scale as realized by means of the resistance thermometer of pure platinum, standardized at the temperatures of melting ice (0° C.), condensing steam (100° C.), and condensing sulphur vapor (444.6° C.), all at standard atmospheric pressure. In the interval −50 to +450° C., temperatures were calculated from the observed resistances of the thermometer by means of Callendar's well-known equation

$$t = \frac{R_t - R_0}{R_{100} - R_0} 100 + \delta \left(\frac{t}{100} - 1 \right) \frac{t}{100}$$

For temperatures below −50° C., corrections as found by Henning [2] were applied to temperatures calculated from the Callendar equation, the maximum correction so applied being +0.08° C. at −78° C. Temperatures on the absolute thermodynamic scale were obtained by adding 273.1° to the measured temperatures on the centigrade scale.

Heat unit.—The calorimetric measurements were all made in terms of the international joule, which was therefore the fundamental heat unit. It seems probable that the international joule is somewhat larger than the corresponding cgs unit, the relation as given in Bureau of Standards Circular No. 60, 2d edition (1920), being

$$1 \textit{ International joule} = 1.00034 \textit{ absolute joules.}$$

[2] Ann. d. Phys. (4), **40**, p. 653; 1913.

In the thermodynamic equations relations occur between quantities of energy, some of which were measured in international joules while others, such as the product of pressure and volume, were measured directly in mechanical units; that is, absolute joules. Although the difference might be considered of negligible importance, it was taken into account where it could have had any appreciable effect on the results given. The basic heat unit used in calculating the tables was the absolute joule.

As secondary heat units the calorie and the British thermal unit (Btu.) have been used. The calorie is defined for the purposes of these tables as 4.183 absolute joules. It can not be stated with certainty at this time whether the calorie here used is larger or smaller than the mean calorie or the 20° calorie. Later investigations may serve to settle this point and to detemine whether the calorie here used is equal to the 20° calorie or some other calorie.

The Btu. as here used is derivable from the calorie by relations which depend only upon the relative size of the centigrade and Fahrenheit degrees and the relation between the kilogram and the pound. Thus,

$$1 \text{ Btu.} \times 453.592 \times \frac{5}{9} = 252.00 \text{ calories} = 1{,}054.1 \text{ joules.}$$

This method of defining the Btu. retains the convenient relation

$$1 \text{ calorie per gram} = 1.8 \text{ Btu. per pound.}$$

Unit of pressure.—It is customary to express numerical values for pressures not in terms of force per unit area, but in terms of the equivalent weight per unit area. In order to make such values definite, it is necessary to specify the gravitational acceleration to which the weight is subjected. In conformity with the recommendation of the International Committee on Weights and Measures in 1901 the standard value taken for the acceleration due to gravity is 980.665 cm per sec. per sec. (32.174 feet per sec. per sec.). The unit of force is therefore equal to that force which is required to support a mass of 1 pound subjected to a gravitational accelaration of 32.174 feet per sec. per sec. The unit of pressure is equal to that pressure which exerts a unit force upon a unit of area, and, in these tables, is expressed in pounds per square inch.

Mechanical equivalent of heat.—The definitions given in the foregoing paragraphs, together with the relation between the foot and the meter and the pound and the kilogram, are sufficient to specify completely the numerical value to be used for the mechanical equivalent of heat.

$$1{,}054.1 \text{ joules} \times \frac{10^7 \times 0.3937}{980.665 \times 453.592 \times 12} = 777.46 \text{ ft.-lbs.}$$

or

$$1 \text{ Btu.} = 777.46 \text{ ft.-lbs.}$$

In using the tables, quantities of heat and quantities of work will be obtained in Btu., and the transformation into mechanical units is secured by multiplying by the factor 777.46. In the cases where the reverse transformation is desired the relation may be written

$$1 \text{ ft.-lb.} = 0.00128624 \text{ Btu.}$$

III. EXPERIMENTAL DATA.

These tables are based upon measurements made in the Bureau of Standards' laboratories. Methods of purifying and testing ammonia were thoroughly investigated and material of a high degree of purity was produced and used throughout. Determinations of most of the measurable thermodynamic properties of ammonia were included in the experimental program, the range of temperature and pressure was at least as great as that likely to be encountered in engineering practice, and the measurements were extended beyond this range as far as could be done conveniently or safely with the apparatus used.

The tables are based primarily upon measurements of the following properties of ammonia:

1. Specific heat of saturated liquid.
2. Latent heat of vaporization.
3. Vapor pressure.
4. Specific volume of saturated liquid.
5. Specific volume of saturated vapor.
6. Specific heat of superheated vapor at constant pressure.
7. Specific volume of superheated vapor.

Measurements were also made of the latent heat of pressure variation, and the compressibility of the liquid and of the Joule-Thomson coefficient for the vapor. These auxiliary measurements were needed to provide data for the evaluation of certain correction terms occurring in the analysis of the principal experiments. The original researches were published in part in the Journal of the American Society of Refrigerating Engineers (now Refrigerating Engineering), in the Journal of the American Chemical Society, and in the Scientific Papers of the Bureau of Standards. The following Scientific Papers dealing with the subject have been published:

S301. An aneroid calorimeter for specific and latent heats, B. S. Bulletin, **14**, p. 133; 1918. (Also in A. S. R. E. Jour., **4**, p. 103; 1917.)

S313. Specific heat of liquid ammonia, B. S. Bulletin, **14**, p. 397; 1918. (Also in A. S. R. E. Jour., **4**, p. 134; 1917; and in J. Am. Chem. Soc., **40**, p. 1; 1918.)

S314. Latent heat of pressure variation of liquid ammonia, B. S. Bulletin, **14**, p. 433; 1918. (Also in A. S. R. E. Jour., **4**, p. 167; 1917.)

S315. Latent heat of vaporization of ammonia. B. S. Bulletin, **14**, p. 439; 1918. (Also in A. S. R. E. Jour., **4**, p. 172; 1917; and in J. Am. Chem. Soc., **40**, p. 14; 1918.

S369. Vapor pressure of ammonia. B. S. Sci. Papers, **16**, p. 1; 1920. (Also in A. S. R. E. Jour., **6**, p. 307; 1920; and in J. Am. Chem. Soc., **42**, p. 206; 1919.)

S420. Specific volume of liquid ammonia. B. S. Sci. Papers, **17**, p. 287; 1921. (Also in A. S. R. E. Jour., **7**, p. 113; 1920.)

S465. Composition, purification, and certain constants of ammonia. B. S. Sci. Papers, **18**, p. 655; 1923. (Also in Ref. Eng., **9**, p. 213; 1923.)

S467. Specific volume of saturated ammonia vapor. B. S. Sci. Papers, **18**, p. 707; 1923. (Also in Ref. Eng., **9**, p. 239; 1923.)

Papers on the following subjects are in preparation and will be published in due course:

(*a*) A flow calorimeter for measuring the specific heat of gases.
(*b*) The specific heat of superheated ammonia vapor.
(*c*) The specific volume of superheated ammonia vapor.
(*d*) Derivation of empirical equations as a basis for ammonia tables.

Preliminary reports on two of these subjects have already been published, as follows:

Flow calorimeter, A. S. R. E Jour., **7**, p. 362; 1921; Phys. Rev., **20**, p. 98; 1922.
Specific heat of superheated ammonia vapor. Ref. Eng., **9**, p. 1; 1922.

The critical temperature of ammonia, where this value was required, was taken as 133° C. (271.4° F.). This value is based on the measurements of Cardoso and Giltay.[3]

IV. NOTATION.

The adoption of a notation which shall be universally satisfactory has not yet been accomplished. In the original scientific papers dealing with properties of ammonia notations were used which served the requirements of those papers. For the purposes of these tables it appeared desirable to avoid the use of Greek letters, primes, or subscripts, and the following notation, which is believed to meet the requirements of the case, has been adopted. The formulas are given to remove any possible ambiguity in the interpretation of the various symbols.

Quantity.	Units.	Symbol.	Formula.
Pressure	lbs./in.^{2}	p	
Gage pressure	lbs./in.^{2}	g.p.	g.p.$=$p-14.7
Temperature	° F	t	
Absolute temperature	° F	T	$T=t+459.58$
Mechanical equivalent of heat	ft.-lbs./Btu	J	$J=777.46$
Specific volume of liquid	ft.^{3}/lb	v	
Specific volume of vapor	ft.^{3}/lb	V	
Heat added (reversible process)	Btu./lb	q	
Internal energy of liquid	Btu./lb	e	$de=dq-0.18522\ pdv$
Internal energy of vapor	Btu./lb	E	$dE=dq-0.18522\ pdV$
Heat content of liquid (also called total heat of liquid)	Btu./lb	h	$dh=de+0.18522\ d(pv)$
Heat content of vapor	Btu./lb	H	$dH=dE+0.18522d(pV)$
Entropy of liquid	Btu./lb. ° F	s	$ds=dq/T$
Entropy of vapor	Btu./lb. ° F	S	$dS=dq/T$
Quality; mass of vapor per unit mass of saturated mixture		x	
Latent heat of vaporization	Btu./lb	L	$L=(\partial q/\partial x)_t$
Latent heat of pressure variation	$\frac{\text{Btu./lb}}{\text{lb./in.}^2}$	l	$l=(\partial q/\partial p)_t$
Sepcific heat of saturated liquid	Btu./lb. ° F	c	$c=(\partial q/\partial t)_{sat.}$
Compressibility of liquid	$\frac{1}{\text{lb./in.}^2}$		$comp=-\frac{1}{v}\left(\frac{\partial v}{\partial p}\right)_t$

[3] Arch. Sci. Phys. Nat. Genève, **34**, p. 20; 1912.

V. EMPIRICAL EQUATIONS.

When the results of the earlier investigations were published, empirical equations were chosen which represented closely the results of the measurements. The forms of these equations were chosen so that they would be consistent with known facts as to the behavior of substances at the critical temperature, so that extrapolation beyond the experimental range could be made with some confidence.

In combining all of the results into a thermodynamically consistent system, some of the original equations could not be retained, while others required slight modification. A set of empirical equations has been formulated, which, within the range of the measurements, are consistent with the laws of classical thermodynamics, and, in addition, express the experimental data within the estimated limit of accuracy of the latter.

The specific volume, heat content, and entropy of the superheated vapor were calculated by means of three empirical equations of the following forms:

$$V=\frac{AT}{p}-\left(\frac{B}{T^3}+\frac{C+Dp}{T^{11}}+\frac{Ep^5}{T^{19}}\right)-F+Tf_1(p) \tag{1}$$

$$H=A\log_{10}T-p\left(\frac{B}{T^3}+\frac{C+Dp}{T^{11}}+\frac{Ep^5}{T^{19}}\right)-Fp+GT+IT^2+K \tag{2}$$

$$S=A\log_{10}T-\frac{p}{T}\left(\frac{B}{T^3}+\frac{C+Dp}{T^{11}}+\frac{Ep^5}{T^{19}}\right)-F\log_{10}p+GT-\frac{I}{T}+f_2(p)+K \tag{3}$$

The corresponding properties of the saturated vapor were calculated by solving the above equations simultaneously with the vapor-pressure equation of the following form:

$$\log_{10}p=A-\frac{B}{T}-C\log_{10}T-DT+ET^2 \tag{4}$$

The properties of the saturated liquid were calculated from equations of the following forms:

$$L=\frac{144}{J}T(V-v)\frac{dp}{dT}\qquad\text{(saturation)} \tag{5}$$

$$v=\frac{A+B\sqrt{t_k-t}-C(t_k-t)}{1+D\sqrt{t_k-t}+E(t_k-t)} \tag{6}$$

$$h=H-L \tag{7}$$

$$s=S-\frac{L}{T} \tag{8}$$

in which H, equation (7), and S, equation (8), apply to properties of the saturated vapor. The compressibility of the liquid was calculated by means of an empirical equation of the form

$$-\frac{1}{v}\left(\frac{\partial v}{\partial p}\right)_t = A + \frac{B}{(t_k - t)^2} \tag{9}$$

Other properties of the liquid under moderate pressures greater than saturation pressure were calculated from the following equations:

$$\left(\frac{\partial v}{\partial t}\right)_p = \left(\frac{dv}{dt}\right)_{sat.} + \left[\left(\frac{\partial v}{\partial p}\right)_t \frac{dp}{dt}\right]_{sat.} - \int_{p(sat.)}^{p} \frac{\partial}{\partial t}\left(\frac{\partial v}{\partial p}\right)_t dp \tag{10}$$

$$l = -\frac{144}{J} T \left(\frac{\partial v}{\partial t}\right)_p \tag{11}$$

$$\left(\frac{\partial h}{\partial p}\right)_t = -\frac{144}{J}\left[T\left(\frac{\partial v}{\partial t}\right)_p - v\right] \tag{12}$$

The constants used in the above equations are tabulated below:

Constant.	Equation number.					
	(1)	(2)	(3)	(4)	(6)	(9)
A	0.6301952	7.60959×10	0.619546	2.55743247×10	6.86064×10^{-2}	1.164×10^{-6}
B	3.18228×10^{7}	2.3577×10^{7}	1.7683×10^{7}	3.2951254×10^{3}	9.7073×10^{-3}	0.3567
C	3.80226×10^{27}	8.451×10^{27}	7.747×10^{27}	6.4012471	7.3738×10^{-5}	.....
D	2.29909×10^{26}	2.555×10^{26}	2.3421×10^{26}	4.148279×10^{-4}	0.31663	.....
E	1.1778×10^{38}	7.272×10^{37}	6.908×10^{37}	1.4759945×10^{-6}	8.8544×10^{-3}	.....
F	0.041648	0.007714	0.2687723	.....	.....	.....
G	.....	0.269065	3.16094×10^{-4}	.....	.....	.....
I	.....	1.58047×10^{-4}	3.3048×10	.....	.....	.....
K	.....	2.62303×10^{2}	0.028463	.....	.....	.....

$f_1(p) = (5300 - 32p + 0.10132p^2 - 0.0000992p^3)\ 10^{-6}$.
$f_2(p) = -p\ (982 - 2.964p + 0.006255p^2 - 0.00000459p^3)\ 10^{-6}$.
$t_k = 271.4°$.

The equations are complicated, but no simpler forms have been found which would satisfy all the requirements. The forms of some of the equations are such that extrapolation much beyond the range of the measurements is not warranted. A detailed account of the derivation of these equations and their agreement with the experimental data is reserved for another publication.

VI. DESCRIPTION OF THE TABLES.

Three principal sets of tables are given: (*a*) Properties of saturated fluid, (*b*) properties of the liquid, and (*c*) properties of the superheated vapor.

The tabulation of the properties of saturated fluid is relatively simple, since only one coordinate is required to fix the values for this state. As a

matter of convenience three separate tables (Tables 1, 2, and 3) of the properties of saturated fluid have been prepared, in which the arguments are temperature, absolute pressure, and gage pressure, respectively. Gage pressure has been included because it is unfortunately true that it will continue to be used in spite of its evident disadvantages. In each of the tables the intervals have been so chosen that linear interpolation is easy and accurate.

In addition to the arguments, pressure and temperature, these tables contain values of the specific volume, density, heat content, and entropy of the saturated vapor, of the heat content and entropy of the saturated liquid, and of the latent heat and entropy of vaporization. On account of lack of space, values for the entropy of vaporization were omitted from Table 1.

It may be noted that certain quantities, such as internal energy and internal latent heat, which appear in some other ammonia tables have been omitted because they are seldom required and, in case of necessity, are readily calculated from the tabulated data.

Both the heat content and entropy of saturated liquid have been arbitrarily assigned the value of zero for the temperature of $-40°$ F. or C. This selection was made partly because $-40°$ represents the same temperature on both the Fahrenheit and centigrade scales and partly because negative values of heat content or entropy would not then be encountered in the usual working range of the tables.

A separate table (Table 4) of the properties of liquid ammonia, with temperature at intervals of 5° as the argument, has been included. The range of this table extends from the triple (freezing) point to the critical temperature, and the table includes data on all of the thermodynamic quantities which were measured at this bureau. The figures given in parentheses represent extrapolations beyond the range of the measurements, and their correctness is therefore uncertain. The data in Table 4 are not often required in engineering practice, but are useful for reference.

Since two coordinates or arguments are necessary to specify the state of a superheated vapor, a table of the properties of the vapor will be much more voluminous than the tables for saturated fluid. Temperature and pressure are conveniently used as arguments, but in order to limit the table to a reasonable size, the chosen intervals must be considerably wider than those used in the saturation tables. The arrangement of the superheat table (Table 5) is similar to that used by Goodenough.[4] For a series of suitably chosen pressures, values of specific volume, heat content, and entropy are tabulated, corresponding to a number of temperatures at

[4] Properties of steam and ammonia, John Wiley & Sons, New York; 1915.

suitably chosen intervals. The intervals of both temperature and pressure are so chosen that no accuracy is lost by linear interpolation. For the convenience of the user certain entries in this table appear in duplicate, which facilitates interpolation.

In computing the figures in the tables from the empirical equations (Section V) all calculations were carried two digits beyond the number to be finally retained in the tables. A first check on the correctness of these numbers was obtained by the method of differences. The rounded off values in the tables have also been checked throughout by the method of differences. Numerous tests of the consistency of the tables have been made by substituting values derived from the tables, in general thermodynamic equations such as

$$\left(\frac{\partial H}{\partial t}\right)_p = T\left(\frac{\partial S}{\partial t}\right)_p ; \left(\frac{\partial S}{\partial p}\right)_t = -\left(\frac{\partial V}{\partial t}\right)_p ; \left(\frac{\partial H}{\partial S}\right)_p = T$$

VII. DESCRIPTION OF THE MOLLIER CHART.

Instead of tabulating numerical values of the properties of ammonia, it is possible to present the same data graphically by means of a chart. For this purpose any two independent coordinates, such as pressure and volume, may be chosen and lines representing constant values of other quantities drawn in their proper places on the chart. Since such a chart would contain five sets of lines representing constant values of pressure, temperature, volume, heat content, and entropy, it is obvious that it would be possible to choose any two of these quantities as "coordinates." The practical usefulness of such a chart depends very much, however, upon what coordinates are chosen. Because accuracy in reading numerical values of heat content is of prime importance, heat content should be chosen as one coordinate.

Charts of this type, which are known as Mollier charts, were introduced by Mollier,[5] who illustrated several forms. Examination of the various forms which these charts assume[6] with some of the other variables as the second coordinate has led to the choice of the logarithm of pressure as the second coordinate, a form already adopted by Callendar.[7] For the chart accompanying these tables heat content was chosen as abscissa, as this makes it possible to use an open scale of heat content and at the same time keep the height of the chart within convenient limits.

Each point at the left of the chart in the region of compressed liquid represents a definite state of the liquid. Each point in the region of superheated vapor represents a definite state of the vapor. Since the state of

[5] Zs. d. Ver. Deutscher. Ing., 48, (1), p. 271; 1904.
[6] A. S. R. E. Jour., 7, p. 419; 1921.
[7] The Callendar steam tables; Longmans, Green & Co.; 1915.

saturated vapor or liquid is determined by a single coordinate, the properties of saturated vapor are represented on the chart by a single line, while those of the liquid are represented by another line, the region between these lines being the region of mixtures. In this region lines of constant quality have been drawn. Since mixtures containing between 20 and 80 per cent vapor are not of much interest in engineering calculations, the central part of the chart has been condensed. It appeared preferable to condense this part of the chart rather than omit it entirely.

The chart as originally drawn is 390 by 1,014 mm (approximately 16 by 40 inches). The ends of each coordinate line were located by means of a beam compass and an accurate scale. Each curve was located by means of a considerable number of suitably chosen points, obtained directly or by interpolation from the tables. The bureau is indebted to the U. S. Coast and Geodetic Survey for advice on the technique of preparing such charts and for loan of equipment.

After the chart was drawn readings were taken systematically on all parts, tabulated, and compared with the tables. In the superheat region about 1,500 values corresponding to 500 distinct points were read. On the lines of saturated liquid and vapor readings were taken at intervals of 10°. In the region of mixtures about 500 readings were made. A few readings were also taken in the region of compressed liquid. The maximum departures of the chart readings from the tabular values were found to be as follows:

The maximum departures of values of entropy as read on the chart from those obtained from the tables were 0.0006 in the region of mixtures and 0.0011 in the superheat region, corresponding to 0.3 and 0.7 Btu., respectively. The maximum departure in temperature was 0.7° in the superheat region and only 0.2° elsewhere. The maximum departure in quality was 0.0009, except in the condensed part of the chart. The departures of values of volume above 500 Btu. did not exceed 0.7 per cent. In the region of mixtures, just above saturated liquid, volumes become very small and the percentage errors in volume, due to very small displacements in the curves or errors in reading, become very large, increasing almost without limit as the liquid line is approached, so that any definite statement as to percentage errors would be misleading. The error in locating the constant volume lines in this region was less than 0.4 mm on the original chart.

A sufficient number of lines have been drawn on the chart so that accurate interpolation is possible without recourse to measurements of distance. Since a photographic process was employed in reproducing the original chart, any distortion incident to this process would not impair

the accuracy of the copy, the only loss of accuracy being that accompanying the reduction in size. The accuracy of the printed chart is likewise not impaired by the dimensional changes to which paper is subject.

VIII. USE OF TABLES AND CHART.

The use of the tables and chart is based largely on three properties of the thermodynamic function called the heat content of a fluid. The three properties referred to are the following:

1. In any process which occurs at constant pressure the increase in heat content is equal to the heat added.

2. In adiabatic compression—that is, at constant entropy—the thermal equivalent of the work done by the compressor is equal to the change in heat content of the fluid between inlet and outlet.

3. In a throttling process, such as occurs at the expansion valve, the increase in heat content is equal to the heat added. Therefore, when no heat is added, the heat content is constant.

By the application of these three propositions the various quantities of heat and work involved in any ideal compression refrigerating cycle can be calculated from either the tables or the chart. It will, perhaps, be useful to show this by a numerical example worked out from both the tables and the chart. Suppose saturated vapor at the temperature of 5° is delivered to the compressor, compressed to a pressure corresponding to saturation at 86°, cooled and condensed to the liquid state at this pressure, expanded through a throttle valve to the pressure at the compressor inlet, and finally after complete evaporation is returned to the compressor. Suppose, further, that the cycle is ideal—that is, the compressor has no clearance—no pressure drop occurs except at the expansion valve and no heat exchange except in the condenser and evaporator. Given these conditions, it is required to find:

1. Pressure at compressor inlet.
2. Specific volume of vapor at compressor inlet.
3. Pressure at compressor outlet; that is, pressure in condenser.
4. Temperature of superheated vapor at compressor outlet.
5. Specific volume of superheated vapor at compressor outlet.
6. Work done by compressor per pound of ammonia circulated.
7. Heat removed by cooling water per pound of ammonia.
8. Heat absorbed by ammonia in evaporator; that is, refrigerating effect per pound of ammonia.
9. Quality of mixture after passing through the expansion valve.
10. Number of pounds of ammonia circulated per minute for a standard commercial ton of refrigeration.
11. Volume of ammonia delivered to compressor per minute for a standard commercial ton of refrigeration.

12. Horsepower required per standard commercial ton of refrigeration.

13. Coefficient of performance.

The pressure (item 1) and specific volume (item 2) at compressor inlet are found in Table 1, being, respectively, the pressure (34.27 lbs./in.^{2}) and specific volume (8.150 ft.^{3}/lb.) of saturated vapor at 5°. Similarly, the pressure at compressor outlet (item 3) is the pressure (169.2 lbs./in.^{2}) of saturated vapor at 86°. On the chart saturation pressures are more accurately read on the liquid line, on which temperatures at intervals of 2° are indicated.

The temperature (item 4) and specific volume (item 5) of the superheated vapor at the compressor outlet are found on the chart by following the (interpolated) line of constant entropy from saturated vapor at 34.3 lbs./in.^{2} to its intersection with the line of 169 lbs./in.^{2} At this point the temperature (210°) and specific volume (2.36 ft.^{3}/lb.) are found. To obtain similar results from the tables the entropy (1.3253) of the saturated vapor at 5° is read from Table 1, and the temperature (209.8°) and specific volume (2.358 ft.^{3}/lb.) corresponding to this value of entropy and the pressure of 169.2 lbs./in.^{2} are obtained by interpolation.

The work done by the compressor per pound of ammonia circulated (item 6) is found in thermal units from either the chart or the tables as the increase in heat content between compressor inlet (613.3 Btu./lb.) and outlet (712.9 Btu./lb.) or 99.6 Btu./lb.

The heat removed by the cooling water per pound of ammonia circulated (item 7) is found in the same manner as the decrease in heat content between superheated vapor at compressor outlet (712.9 Btu./lb.) and saturated liquid at 86° (138.9 Btu./lb.) or 574 Btu./lb.

The refrigerating effect per pound of ammonia (item 8) is found as the difference between the quantity of heat removed by the cooling water (574 Btu./lb.) and the work done by the compressor (99.6 Btu./lb.) or 474.4 Btu./lb. This quantity may also be found as the increase in heat content between saturated liquid at 86° (138.9 Btu./lb.) and saturated vapor at 5° (613.3 Btu./lb.).

The quality of the mixture (item 9) can be read directly from the chart by following a line of constant heat content from saturated liquid at 86° (138.9 Btu./lb.) to its intersection with the line of constant pressure at 34.3 lbs./in.^{2} At this point the quality is read as 0.161, which signifies that 16.1 per cent of the liquid was evaporated in passing through the expansion valve. This value of quality can not be read directly from the tables but can be calculated from the tabulated data, using the equation:

$$\text{Quality} = \frac{h_{86°} - h_{5°}}{H_{5°} - h_{5°}} = \frac{138.9 - 48.3}{613.3 - 48.3} = 0.1603$$

The American Society of Refrigerating Engineers has defined the standard commercial ton of refrigeration as a rate which is equivalent to the transfer of 200 Btu. per minute.[8] The number of pounds of ammonia which must be circulated per minute for a standard commercial ton of refrigeration (item 10) is therefore equal to 200 divided by the refrigerating effect per pound of ammonia (474.4 Btu.), the result being 0.4216 lbs./min.

The volume of ammonia which must be delivered to the compressor per minute for a standard commercial ton of refrigeration (item 11) is equal to the number of pounds of ammonia circulated per minute (0.4216) multiplied by the specific volume of the ammonia at the compressor inlet (8.150 ft.^{3}/lb.) the result being 3.436 ft.^{3}/min.

The horsepower required per standard commercial ton of refrigeration (item 12) is found by multiplying the thermal equivalent of the work of compression (99.6 Btu./lb.) by the number of pounds of ammonia circulated per minute (0.4216), and reducing to horsepower by the use of the appropriate factors, as follows:

$$\text{H. P./ton} = \frac{99.6 \times 0.4216 \times 777.46}{33000} = 0.989$$

The coefficient of performance (item 13), ratio of the heat absorbed in the evaporator (474.4 Btu./lb.) to the thermal equivalent of the work of compression (99.6 Btu./lb.), is equal to 4.764.

The following table gives the numerical values of the various items as obtained from the tables and chart. For the sake of comparison figures derived from the tables of Keyes and Brownlee,[9] and of Goodenough and Mosher,[10] are also given. The figures read from the chart represent the average readings of five persons. In a separate column the maximum deviation of individual chart readings from the mean is given.

Item.	Quantity.	Bureau of Standards tables.	Good-enough and Mosher tables.	Keyes and Brownlee tables.	Bureau of Standards chart.	Maximum deviation of individual chart readings.
1	Inlet pressure	34.27	33.79	34.47	34.4	0.1
2	Inlet volume	8.150	8.20	8.20	8.2	0.0
3	Outlet pressure	169.2	170.2	170.5	169.0	0.0
4	Outlet temperature	209.8	213.8	255.6	210	1.0
5	Outlet volume	2.358	2.34	2.505	2.36	0.01
6	Work of compression	99.6	100.8	104.8	99.4	0.5
7	Heat removed by condenser	574.0	580.1	588.1	574.0	0.6
8	Heat absorbed in evaporator	474.4	469.3	483.3	474.6	0.2
9	Quality after expansion	0.1603	0.1566	0.1617	0.161	0.001
10	Lbs. NH_3 per min. per ton refrigeration	0.4216	0.4262	0.4138	0.4214	.....
11	Ft.^{3} NH_3 per min. per ton refrigeration	3.436	3.494	3.393	3.456	.....
12	H.P. per ton refrigeration	0.989	1.012	1.022	0.987	.....
13	Coefficient of performance	4.764	4.656	4.612	4.775	.....

[8] A. S. R. E. Jour., 7, p. 322; 1921.
[9] Thermodynamic properties of ammonia, John Wiley & Sons, New York; 1916.
[10] Univ. of Ill. Bulletin, No. 66; 1913.

IX. GRAPHS OF CERTAIN PROPERTIES OF AMMONIA.

Although numerical values of all of the properties of ammonia which are of interest to the engineer may be read or derived from the tables or chart, a few small figures are reproduced here to illustrate graphically how some of the important properties vary with the temperature. These graphs may enable those not familiar with these properties to visualize more clearly their general behavior with respect to this variable.

Figure 1 shows the saturation vapor pressure and illustrates the relatively slow rate of increase of this pressure at low temperatures and the higher rate of increase at higher temperatures.

Figure 2 shows the variation with temperature of the specific volume of the saturated vapor and of the superheated vapor for several pressures. The figure illustrates the rapid increase in the volume of saturated vapor with decreasing temperature. The region below the saturated vapor line represents volumes of mixtures of liquid and vapor. The dotted adiabatic compression curve, or line of constant entropy, illustrates the variation of volume during an ideal process of adiabatic compression. This curve starts at the comparatively low pressure of 6 lbs./in.^{2} absolute, so that volumes in the region above the curve are rarely encountered in engineering practice. The useful region is therefore that between the adiabatic compression curve and the curve for saturated vapor.

Figure 3 shows the variation with temperature of the latent heat of vaporization and of the heat content of liquid and vapor. These curves have been extended to the critical temperature in order to show their characteristics more clearly, namely, that the latent heat becomes zero at the critical temperature and that the heat content of liquid and vapor become identical. The latent heat at any temperature is equal to the difference between the heat content of vapor and liquid, respectively, at that temperature.

Figure 4 shows the variations with temperature of the specific heat, C_p of the vapor for several constant pressures and shows, on the curve of saturation values, the limiting values of C_p at saturation temperatures and corresponding saturation pressures. These curves are of value chiefly in showing that C_p can not be considered as even approximately constant. One great advantage of using the tables of the Mollier chart is that it is not necessary to use values of C_p at all, since the necessary data can be obtained from the appropriate values of heat content.

WASHINGTON, February 26, 1923.

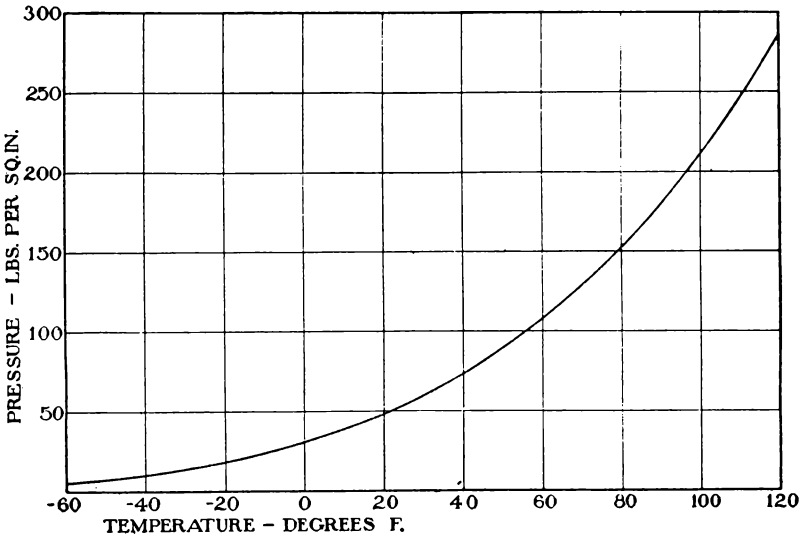

FIG. 1.—*Vapor pressure of ammonia.*

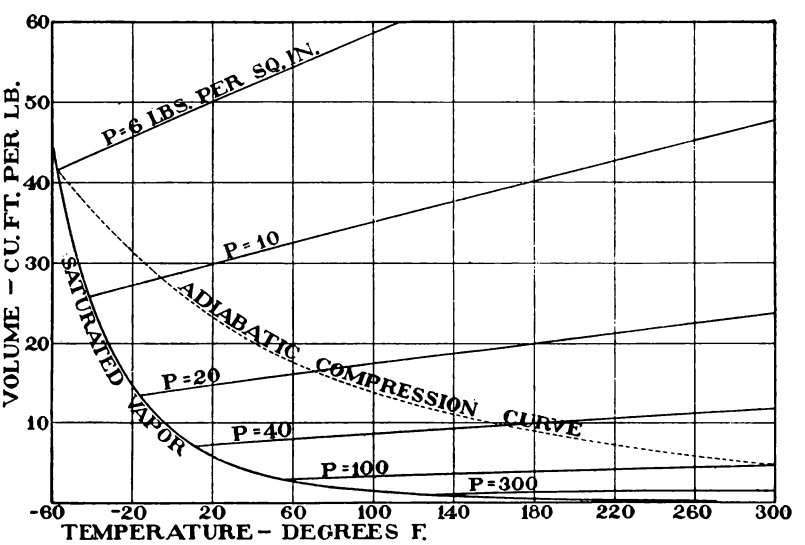

FIG. 2.—*Specific volume of ammonia vapor.*

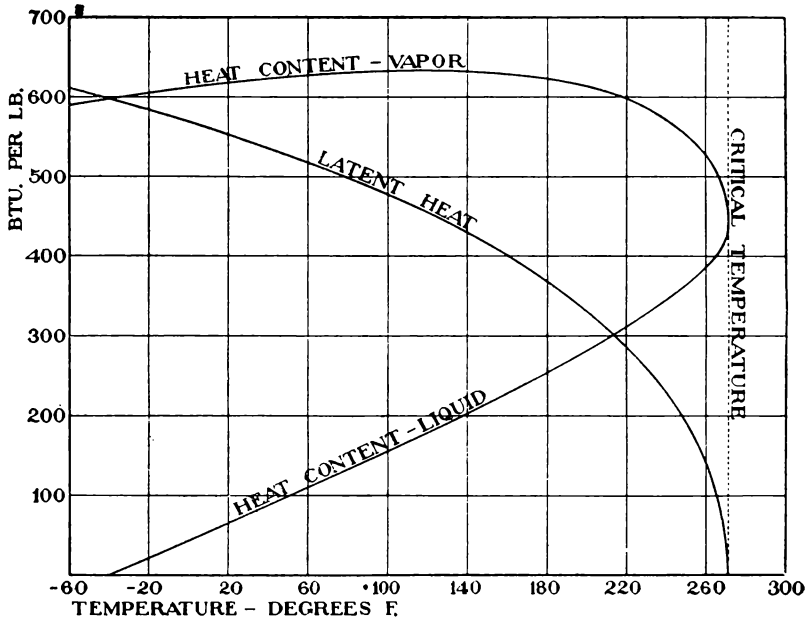

FIG. 3.—*Latent heat of vaporization and heat content of saturated ammonia vapor and liquid.*

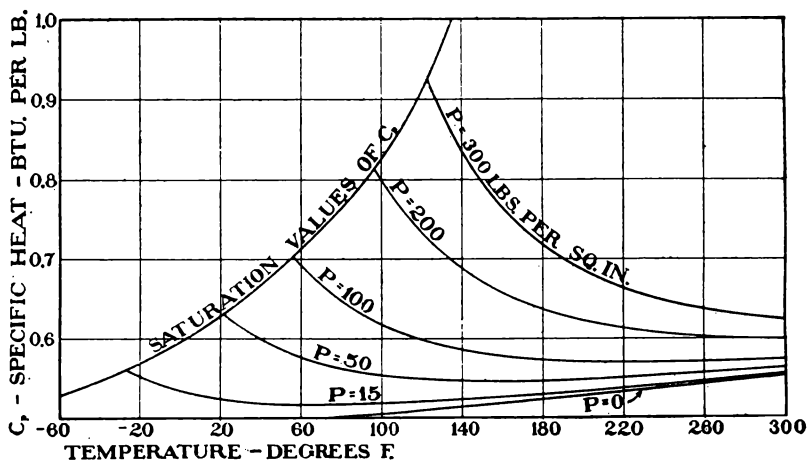

FIG. 4.—*Specific heat of ammonia vapor at constant pressure.*

X. TABLES 1 TO 5.

TABLE 1.—Saturated Ammonia: Temperature Table.

Temp. °F.	Pressure. Absolute. lbs./in.²	Pressure. Gage. lbs./in.²	Volume vapor. ft³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Temp. °F.
t	*p*	*g. p.*	*V*	*1/V*	*h*	*H*	*L*	*s*	*S*	*t*
−60	5.55	*18.6	44.73	0.02235	−21.2	589.6	610.8	−0.0517	1.4769	**−60**
−59	5.74	*18.2	43.37	.02306	−20.1	590.0	610.1	−.0490	.4741	−59
−58	5.93	*17.8	42.05	.02378	−19.1	590.4	609.5	−.0464	.4713	−58
−57	6.13	*17.4	40.79	.02452	−18.0	590.8	608.8	−.0438	.4686	−57
−56	6.33	*17.0	39.56	.02528	−17.0	591.2	608.2	−.0412	.4658	−56
−55	6.54	*16.6	38.38	0.02605	−15.9	591.6	607.5	−0.0386	1.4631	**−55**
−54	6.75	*16.2	37.24	.02685	−14.8	592.1	606.9	.0360	.4604	−54
−53	6.97	*15.7	36.15	.02766	−13.8	592.4	606.2	−.0334	.4577	−53
−52	7.20	*15.3	35.09	.02850	−12.7	592.9	605.6	−.0307	.4551	−52
−51	7.43	*14.8	34.06	.02936	−11.7	593.2	604.9	−.0281	.4524	−51
−50	7.67	*14.3	33.08	0.03023	−10.6	593.7	604.3	−0.0256	1.4497	**−50**
−49	7.91	*13.8	32.12	.03113	−9.6	594.0	603.6	−.0230	.4471	−49
−48	8.16	*13.3	31.20	.03205	−8.5	594.4	602.9	−.0204	.4445	−48
−47	8.42	*12.8	30.31	.03299	−7.4	594.9	602.3	−.0179	.4419	−47
−46	8.68	*12.2	29.45	.03395	−6.4	595.2	601.6	−.0153	.4393	−46
−45	8.95	*11.7	28.62	0.03494	−5.3	595.6	600.9	−0.0127	1.4368	**−45**
−44	9.23	*11.1	27.82	.03595	−4.3	596.0	600.3	−.0102	.4342	−44
−43	9.51	*10.6	27.04	.03698	−3.2	596.4	599.6	−.0076	.4317	−43
−42	9.81	*10.0	26.29	.03804	−2.1	596.8	598.9	−.0051	.4292	−42
−41	10.10	*9.3	25.56	.03912	−1.1	597.2	598.3	−.0025	.4267	−41
−40	10.41	*8.7	24.86	0.04022	0.0	597.6	597.6	0.0000	1.4242	**−40**
−39	10.72	*8.1	24.18	.04135	1.1	598.0	596.9	.0025	.4217	−39
−38	11.04	*7.4	23.53	.04251	2.1	598.3	596.2	.0051	.4193	−38
−37	11.37	*6.8	22.89	.04369	3.2	598.7	595.5	.0076	.4169	−37
−36	11.71	*6.1	22.27	.04489	4.3	599.1	594.8	.0101	.4144	−36
−35	12.05	*5.4	21.68	0.04613	5.3	599.5	594.2	0.0126	1.4120	**−35**
−34	12.41	*4.7	21.10	.04739	6.4	599.9	593.5	.0151	.4096	−34
−33	12.77	*3.9	20.54	.04868	7.4	600.2	592.8	.0176	.4072	−33
−32	13.14	*3.2	20.00	.04999	8.5	600.6	592.1	.0201	.4048	−32
−31	13.52	*2.4	19.48	.05134	9.6	601.0	591.4	.0226	.4025	−31
−30	13.90	*1.6	18.97	0.05271	10.7	601.4	590.7	0.0250	1.4001	**−30**
−29	14.30	*0.8	18.48	.05411	11.7	601.7	590.0	.0275	.3978	−29
−28	14.71	0.0	18.00	.05555	12.8	602.1	589.3	.0300	.3955	−28
−27	15.12	0.4	17.54	.05701	13.9	602.5	588.6	.0325	.3932	−27
−26	15.55	0.8	17.09	.05850	14.9	602.8	587.9	.0350	.3909	−26
−25	15.98	1.3	16.66	0.06003	16.0	603.2	587.2	0.0374	1.3886	**−25**
−24	16.42	1.7	16.24	.06158	17.1	603.6	586.5	.0399	.3863	−24
−23	16.88	2.2	15.83	.06317	18.1	603.9	585.8	.0423	.3840	−23
−22	17.34	2.6	15.43	.06479	19.2	604.3	585.1	.0448	.3818	−22
−21	17.81	3.1	15.05	.06644	20.3	604.6	584.3	.0472	.3796	−21
−20	18.30	3.6	14.68	0.06813	21.4	605.0	583.6	0.0497	1.3774	**−20**
−19	18.79	4.1	14.32	.06985	22.4	605.3	582.9	.0521	.3752	−19
−18	19.30	4.6	13.97	.07161	23.5	605.7	582.2	.0545	.3729	−18
−17	19.81	5.1	13.62	.07340	24.6	606.1	581.5	.0570	.3708	−17
−16	20.34	5.6	13.29	.07522	25.6	606.4	580.8	.0594	.3686	−16
−15	20.88	6.2	12.97	0.07709	26.7	606.7	580.0	0.0618	1.3664	**−15**
−14	21.43	6.7	12.66	.07898	27.8	607.1	579.3	.0642	.3643	−14
−13	21.99	7.3	12.36	.08092	28.9	607.5	578.6	.0666	.3621	−13
−12	22.56	7.9	12.06	.08289	30.0	607.8	577.8	.0690	.3600	−12
−11	23.15	8.5	11.78	.08490	31.0	608.1	577.1	.0714	.3579	−11
−10	23.74	9.0	11.50	0.08695	32.1	608.5	576.4	0.0738	1.3558	**−10**

* Inches of mercury below one standard atmosphere (29.92 in.).

TABLE 1.—Saturated Ammonia: Temperature Table—Continued.

Temp. °F.	Pressure. Absolute. lbs./in.²	Pressure. Gage. lbs./in.²	Volume vapor. ft³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Temp. °F.
t	p	$g.\ p.$	V	$1/V$	h	H	L	s	S	t
−10	23.74	9.0	11.50	0.08695	32.1	608.5	576.4	0.0738	1.3558	**−10**
−9	24.35	9.7	11.23	.08904	33.2	608.8	575.6	.0762	.3537	−9
−8	24.97	10.3	10.97	.09117	34.3	609.2	574.9	.0786	.3516	−8
−7	25.61	10.9	10.71	.09334	35.4	609.5	574.1	.0809	.3495	−7
−6	26.26	11.6	10.47	.09555	36.4	609.8	573.4	.0833	.3474	−6
−5	26.92	12.2	10.23	0.09780	37.5	610.1	572.6	0.0857	1.3454	**−5**
−4	27.59	12.9	9.991	.1001	38.6	610.5	571.9	.0880	.3433	−4
−3	28.28	13.6	9.763	.1024	39.7	610.8	571.1	.0904	.3413	−3
−2	28.98	14.3	9.541	.1048	40.7	611.1	570.4	.0928	.3393	−2
−1	29.69	15.0	9.326	.1072	41.8	611.4	569.6	.0951	.3372	−1
0	30.42	15.7	9.116	0.1097	42.9	611.8	568.9	0.0975	1.3352	**0**
1	31.16	16.5	8.912	.1122	44.0	612.1	568.1	.0998	.3332	1
2	31.92	17.2	8.714	.1148	45.1	612.4	567.3	.1022	.3312	2
3	32.69	18.0	8.521	.1174	46.2	612.7	566.5	.1045	.3292	3
4	33.47	18.8	8.333	.1200	47.2	613.0	565.8	.1069	.3273	4
5	34.27	19.6	8.150	0.1227	48.3	613.3	565.0	0.1092	1.3253	**5**
6	35.09	20.4	7.971	.1254	49.4	613.6	564.2	.1115	.3234	6
7	35.92	21.2	7.798	.1282	50.5	613.9	563.4	.1138	.3214	7
8	36.77	22.1	7.629	.1311	51.6	614.3	562.7	.1162	.3195	8
9	37.63	22.9	7.464	.1340	52.7	614.6	561.9	.1185	.3176	9
10	38.51	23.8	7.304	0.1369	53.8	614.9	561.1	0.1208	1.3157	**10**
11	39.40	24.7	7.148	.1399	54.9	615.2	560.3	.1231	.3137	11
12	40.31	25.6	6.996	.1429	56.0	615.5	559.5	.1254	.3118	12
13	41.24	26.5	6.847	.1460	57.1	615.8	558.7	.1277	.3099	13
14	42.18	27.5	6.703	.1492	58.2	616.1	557.9	.1300	.3081	14
15	43.14	28.4	6.562	0.1524	59.2	616.3	557.1	0.1323	1.3062	**15**
16	44.12	29.4	6.425	.1556	60.3	616.6	556.3	.1346	.3043	16
17	45.12	30.4	6.291	.1590	61.4	616.9	555 5	.1369	.3025	17
18	46.13	31.4	6.161	.1623	62.5	617.2	554.7	.1392	.3006	18
19	47.16	32.5	6.034	.1657	63.6	617.5	553.9	.1415	.2988	19
20	48.21	33.5	5.910	0.1692	64.7	617.8	553.1	0.1437	1.2969	**20**
21	49.28	34.6	5.789	.1728	65.8	618.0	552.2	.1460	.2951	21
22	50.36	35.7	5.671	.1763	66.9	618.3	551.4	.1483	.2933	22
23	51.47	36.8	5.556	.1800	68.0	618.6	550.6	.1505	.2915	23
24	52.59	37.9	5.443	.1837	69.1	618.9	549.8	.1528	.2897	24
25	53.73	39.0	5.334	0.1875	70.2	619.1	548.9	0.1551	1.2879	**25**
26	54.90	40.2	5.227	.1913	71.3	619.4	548.1	.1573	.2861	26
27	56.08	41.4	5.123	.1952	72.4	619.7	547.3	.1596	.2843	27
28	57.28	42.6	5.021	.1992	73.5	619.9	546.4	.1618	.2825	28
29	58.50	43.8	4.922	.2032	74.6	620.2	545.6	.1641	.2808	29
30	59.74	45.0	4.825	0.2073	75.7	620.5	544.8	0.1663	1.2790	**30**
31	61.00	46.3	4.730	.2114	76.8	620.7	543.9	.1686	.2773	31
32	62.29	47.6	4.637	.2156	77.9	621.0	543.1	.1708	.2755	32
33	63.59	48.9	4.547	.2199	79.0	621.2	542.2	.1730	.2738	33
34	64.91	50.2	4.459	.2243	80.1	621.5	541.4	.1753	.2721	34
35	66.26	51.6	4.373	0.2287	81.2	621.7	540.5	0.1775	1.2704	**35**
36	67.63	52.9	4.289	.2332	82.3	622.0	539.7	.1797	.2686	36
37	69.02	54.3	4.207	.2377	83.4	622.2	538.8	.1819	.2669	37
38	70.43	55.7	4.126	.2423	84.6	622.5	537.9	.1841	.2652	38
39	71.87	57.2	4.048	.2470	85.7	622.7	537.0	.1863	.2635	39
40	73.32	58.6	3.971	0.2518	86.8	623.0	536.2	0.1885	1,2618	**40**

TABLE 1.—Saturated Ammonia: Temperature Table—Continued.

Temp. °F.	Pressure. Absolute. lbs./in.²	Pressure. Gage. lbs./in.²	Volume vapor. ft.³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Temp. °F.
t	*p*	*g. p.*	*V*	*1/V*	*h*	*H*	*L*	*s*	*S*	*t*
40	73.32	58.6	3.971	0.2518	86.8	623.0	536.2	0.1885	1.2618	**40**
41	74.80	60.1	3.897	.2566	87.9	623.2	535.3	.1908	.2602	41
42	76.31	61.6	3.823	.2616	89.0	623.4	534.4	.1930	.2585	42
43	77.83	63.1	3.752	.2665	90.1	623.7	533.6	.1952	.2568	43
44	79.38	64.7	3.682	.2716	91.2	623.9	532.7	.1974	.2552	44
45	80.96	66.3	3.614	0.2767	92.3	624.1	531.8	0.1996	1.2535	**45**
46	82.55	67.9	3.547	.2819	93.5	624.4	530.9	.2018	.2519	46
47	84.18	69.5	3.481	.2872	94.6	624.6	530.0	.2040	.2502	47
48	85.82	71.1	3.418	.2926	95.7	624.8	529.1	.2062	.2486	48
49	87.49	72.8	3.355	.2981	96.8	625.0	528.2	.2083	.2469	49
50	89.19	74.5	3.294	0.3036	97.9	625.2	527.3	0.2105	1.2453	**50**
51	90.91	76.2	3.234	.3092	99.1	625.5	526.4	.2127	.2437	51
52	92.66	78.0	3.176	.3149	100.2	625.7	525.5	.2149	.2421	52
53	94.43	79.7	3.119	.3207	101.3	625.9	524.6	.2171	.2405	53
54	96.23	81.5	3.063	.3265	102.4	626.1	523.7	.2192	.2389	54
55	98.06	83.4	3.008	0.3325	103.5	626.3	522.8	0.2214	1.2373	**55**
56	99.91	85.2	2.954	.3385	104.7	626.5	521.8	.2236	.2357	56
57	101.8	87.1	2.902	.3446	105.8	626.7	520.9	.2257	.2341	57
58	103.7	89.0	2.851	.3508	106.9	626.9	520.0	.2279	.2325	58
59	105.6	90.9	2.800	.3571	108.1	627.1	519.0	.2301	.2310	59
60	107.6	92.9	2.751	0.3635	109.2	627.3	518.1	0.2322	1.2294	**60**
61	109.6	94.9	2.703	.3700	110.3	627.5	517.2	.2344	.2278	61
62	111.6	96.9	2.656	.3765	111.5	627.7	516.2	.2365	.2262	62
63	113.6	98.9	2.610	.3832	112.6	627.9	515.3	.2387	.2247	63
64	115.7	101.0	2.565	.3899	113.7	628.0	514.3	.2408	.2231	64
65	117.8	103.1	2.520	0.3968	114.8	628.2	513.4	0.2430	1.2216	**65**
66	120.0	105.3	2.477	.4037	116.0	628.4	512.4	.2451	.2201	66
67	122.1	107.4	2.435	.4108	117.1	628.6	511.5	.2473	.2186	67
68	124.3	109.6	2.393	.4179	118.3	628.8	510.5	.2494	.2170	68
69	126.5	111.8	2.352	.4251	119.4	628.9	509.5	.2515	.2155	69
70	128.8	114.1	2.312	0.4325	120.5	629.1	508.6	0.2537	1.2140	**70**
71	131.1	116.4	2.273	.4399	121.7	629.3	507.6	.2558	.2125	71
72	133.4	118.7	2.235	.4474	122.8	629.4	506.6	.2579	.2110	72
73	135.7	121.0	2.197	.4551	124.0	629.6	505.6	.2601	.2095	73
74	138.1	123.4	2.161	.4628	125.1	629.8	504.7	.2622	.2080	74
75	140.5	125.8	2.125	0.4707	126.2	629.9	503.7	0.2643	1.2065	**75**
76	143.0	128.3	2.089	.4786	127.4	630.1	502.7	.2664	.2050	76
77	145.4	130.7	2.055	.4867	128.5	630.2	501.7	.2685	.2035	77
78	147.9	133.2	2.021	.4949	129.7	630.4	500.7	.2706	.2020	78
79	150.5	135.8	1.988	.5031	130.8	630.5	499.7	.2728	.2006	79
80	153.0	138.3	1.955	0.5115	132.0	630.7	498.7	0.2749	1.1991	**80**
81	155.6	140.9	1.923	.5200	133.1	630.8	497.7	.2769	.1976	81
82	158.3	143.6	1.892	.5287	134.3	631.0	496.7	.2791	.1962	82
83	161.0	146.3	1.861	.5374	135.4	631.1	495.7	.2812	.1947	83
84	163.7	149.0	1.831	.5462	136.6	631.3	494.7	.2833	.1933	84
85	166.4	151.7	1.801	0.5552	137.8	631.4	493.6	0.2854	1.1918	**85**

TABLE 1.—Saturated Ammonia: Temperature Table—Continued.

Temp. °F.	Pressure. Absolute. lbs./in.²	Pressure. Gage. lbs./in.²	Volume vapor. ft.³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Temp. °F.
t	*p*	*g. p.*	*V*	*1/V*	*h*	*H*	*L*	*s*	*S*	*t*
85	166.4	151.7	1.801	0.5552	137.8	631.4	493.6	0.2854	1.1918	**85**
86	169.2	154.5	1.772	.5643	138.9	631.5	492.6	.2875	.1904	86
87	172.0	157.3	1.744	.5735	140.1	631.7	491.6	.2895	.1889	87
88	174.8	160.1	1.716	.5828	141.2	631.8	490.6	.2917	.1875	88
89	177.7	163.0	1.688	.5923	142.4	631.9	489.5	.2937	.1860	89
90	180.6	165.9	1.661	0.6019	143.5	632.0	488.5	0.2958	1.1846	**90**
91	183.6	168.9	1.635	.6116	144.7	632.1	487.4	.2979	.1832	91
92	186.6	171.9	1.609	.6214	145.8	632.2	486.4	.3000	.1818	92
93	189.6	174.9	1.584	.6314	147.0	632.3	485.3	.3021	.1804	93
94	192.7	178.0	1.559	.6415	148.2	632.5	484.3	.3041	.1789	94
95	195.8	181.1	1.534	0.6517	149.4	632.6	483.2	0.3062	1.1775	**95**
96	198.9	184.2	1.510	.6620	150.5	632.6	482.1	.3083	.1761	96
97	202.1	187.4	1.487	.6725	151.7	632.8	481.1	.3104	.1747	97
98	205.3	190.6	1.464	.6832	152.9	632.9	480.0	.3125	.1733	98
99	208.6	193.9	1.441	.6939	154.0	632.9	478.9	.3145	.1719	99
100	211.9	197.2	1.419	0.7048	155.2	633.0	477.8	0.3166	1.1705	**100**
101	215.2	200.5	1.397	.7159	156.4	633.1	476.7	.3187	.1691	101
102	218.6	203.9	1.375	.7270	157.6	633.2	475.6	.3207	.1677	102
103	222.0	207.3	1.354	.7384	158.7	633.3	474.6	.3228	.1663	103
104	225.4	210.7	1.334	.7498	159.9	633.4	473.5	.3248	.1649	104
105	228.9	214.2	1.313	0.7615	161.1	633.4	472.3	0.3269	1.1635	**105**
106	232.5	217.8	1.293	.7732	162.3	633.5	471.2	.3289	.1621	106
107	236.0	221.3	1.274	.7852	163.5	633.6	470.1	.3310	.1607	107
108	239.7	225.0	1.254	.7972	164.6	633.6	469.0	.3330	.1593	108
109	243.3	228.6	1.235	.8095	165.8	633.7	467.9	.3351	.1580	109
110	247.0	232.3	1.217	0.8219	167.0	633.7	466.7	0.3372	1.1566	**110**
111	250.8	236.1	1.198	.8344	168.2	633.8	465.6	.3392	.1552	111
112	254.5	239.8	1.180	.8471	169.4	633.8	464.4	.3413	.1538	112
113	258.4	243.7	1.163	.8600	170.6	633.9	463.3	.3433	.1524	113
114	262.2	247.5	1.145	.8730	171.8	633.9	462.1	.3453	.1510	114
115	266.2	251.5	1.128	0.8862	173.0	633.9	460.9	0.3474	1.1497	**115**
116	270.1	255.4	1.112	.8996	174.2	634.0	459.8	.3495	.1483	116
117	274.1	259.4	1.095	.9132	175.4	634.0	458.6	.3515	.1469	117
118	278.2	263.5	1.079	.9269	176.6	634.0	457.4	.3535	.1455	118
119	282.3	267.6	1.063	.9408	177.8	634.0	456.2	.3556	.1441	119
120	286.4	271.7	1.047	0.9549	179.0	634.0	455.0	0.3576	1.1427	**120**
121	290.6	275.9	1.032	.9692	180.2	634.0	453.8	.3597	.1414	121
122	294.8	280.1	1.017	.9837	181.4	634.0	452.6	.3618	.1400	122
123	299.1	284.4	1.002	.9983	182.6	634.0	451.4	.3638	.1386	123
124	303.4	288.7	0.987	1.0132	183.9	634.0	450.1	.3659	.1372	124
125	307.8	293.1	0.973	1.028	185.1	634.0	448.9	0.3679	1.1358	**125**

TABLE 2.—Saturated Ammonia: Absolute Pressure Table.

Pressure (abs.). lbs./in.² p	Temp. °F. t	Volume vapor. ft.³/lb. V	Density vapor. lbs./ft.³ $1/V$	Heat content. Liquid. Btu./lb. h	Heat content. Vapor. Btu./lb. H	Latent heat. Btu./lb. L	Entropy. Liquid. Btu./lb. °F. s	Entropy. Evap. Btu./lb.°F. L/T	Entropy. Vapor. Btu./lb.°F. S	Pressure (abs.). lbs./in.² p
5.0	−63.11	49.31	0.02029	−24.5	588.3	612.8	−0.0599	1.5456	1.4857	**5.0**
5.5	−60.27	45.11	.02217	−21.5	589.5	611.0	− .0524	.5301	.4777	5.5
6.0	−57.64	41.59	.02405	−18.7	590.6	609.3	− .0455	.5158	.4703	6.0
6.5	−55.18	38.59	.02591	−16.1	591.6	607.7	− .0390	.5026	.4636	6.5
7.0	−52.88	36.01	.02777	−13.7	592.5	606.2	− .0330	.4904	.4574	7.0
7.5	−50.70	33.77	0.02962	−11.3	593.4	604.7	−0.0274	1.4790	1.4516	**7.5**
8.0	−48.64	31.79	.03146	− 9.2	594.2	603.4	− .0221	.4683	.4462	8.0
8.5	−46.69	30.04	.03329	− 7.1	595.0	602.1	− .0171	.4582	.4411	8.5
9.0	−44.83	28.48	.03511	− 5.1	595.7	600.8	− .0123	.4486	.4363	9.0
9.5	−43.05	27.08	.03693	− 3.2	596.4	599.6	− .0077	.4396	.4319	9.5
10.0	−41.34	25.81	0.03874	− 1.4	597.1	598.5	−0.0034	1.4310	1.4276	**10.0**
10.5	−39.71	24.66	.04055	+ 0.3	597.7	597.4	+ .0007	.4228	.4235	10.5
11.0	−38.14	23.61	.04235	2.0	598.3	596.3	.0047	.4149	.4196	11.0
11.5	−36.62	22.65	.04414	3.6	598.9	595.3	.0085	.4074	.4159	11.5
12.0	−35.16	21.77	.04593	5.1	599.4	594.3	.0122	.4002	.4124	12.0
12.5	−33.74	20.96	0.04772	6.7	600.0	593.3	0.0157	1.3933	1.4090	**12.5**
13.0	−32.37	20.20	.04950	8.1	600.5	592.4	.0191	.3866	.4057	13.0
13.5	−31.05	19.50	.05128	9.6	601.0	591.4	.0225	.3801	.4026	13.5
14.0	−29.76	18.85	.05305	10.9	601.4	590.5	.0257	.3739	.3996	14.0
14.5	−28.51	18.24	.05482	12.2	601.9	589.7	.0288	.3679	.3967	14.5
15.0	−27.29	17.67	0.05658	13.6	602.4	588.8	0.0318	1.3620	1.3938	**15.0**
15.5	−26.11	17.14	.05834	14.8	602.8	588.0	.0347	.3564	.3911	15.5
16.0	−24.95	16.64	.06010	16.0	603.2	587.2	.0375	.3510	.3885	16.0
16.5	−23.83	16.17	.06186	17.2	603.6	586.4	.0403	.3456	.3859	16.5
17.0	−22.73	15.72	.06361	18.4	604.0	585.6	.0430	.3405	.3835	17.0
17.5	−21.66	15.30	0.06535	19.6	604.4	584.8	0.0456	1.3354	1.3810	**17.5**
18.0	−20.61	14.90	.06710	20.7	604.8	584.1	.0482	.3305	.3787	18.0
18.5	−19.59	14.53	.06884	21.8	605.1	583.3	.0507	.3258	.3765	18.5
19.0	−18.58	14.17	.07058	22.9	605.5	582.6	.0531	.3211	.3742	19.0
19.5	−17.60	13.83	.07232	23.9	605.8	581.9	.0555	.3166	.3721	19.5
20.0	−16.64	13.50	0.07405	25.0	606.2	581.2	0.0578	1.3122	1.3700	**20.0**
20.5	−15.70	13.20	.07578	26.0	606.5	580.5	.0601	.3078	.3679	20.5
21.0	−14.78	12.90	.07751	27.0	606.8	579.8	.0623	.3036	.3659	21.0
21.5	−13.87	12.62	.07924	27.9	607.1	579.2	.0645	.2995	.3640	21.5
22.0	−12.98	12.35	.08096	28.9	607.4	578.5	.0666	.2955	.3621	22.0
22.5	−12.11	12.09	0.08268	29.8	607.7	577.9	0.0687	1.2915	1.3602	**22.5**
23.0	−11.25	11.85	.08440	30.8	608.1	577.3	.0708	.2876	.3584	23.0
23.5	−10.41	11.61	.08612	31.7	608.3	576.6	.0728	.2838	.3566	23.5
24.0	− 9.58	11.39	.08783	32.6	608.6	576.0	.0748	.2801	.3549	24.0
24.5	− 8.76	11.17	.08955	33.5	608.9	575.4	.0768	.2764	.3532	24.5
25.0	− 7.96	10.96	0.09126	34.3	609.1	574.8	0.0787	1.2728	1.3515	**25.0**
25.5	− 7.17	10.76	.09297	35.2	609.4	574.2	.0805	.2693	.3498	25.5
26.0	− 6.39	10.56	.09468	36.0	609.7	573.7	.0824	.2658	.3482	26.0
26.5	− 5.63	10.38	.09638	36.8	609.9	573.1	.0842	.2625	.3467	26.5
27.0	− 4.87	10.20	.09809	37.7	610.2	572.5	.0860	.2591	.3451	27.0
27.5	− 4.13	10.02	0.09979	38.4	610.4	572.0	0.0878	1.2558	1.3436	**27.5**
28.0	− 3.40	9.853	.1015	39.3	610.7	571.4	.0895	.2526	.3421	28.0
28.5	− 2.68	9.691	.1032	40.0	610.9	570.9	.0912	.2494	.3406	28.5
29.0	− 1.97	9.534	.1049	40.8	611.1	570.3	.0929	.2463	.3392	29.0
29.5	− 1.27	9.383	.1066	41.6	611.4	569.8	.0945	.2433	.3378	29.5
30.0	− 0.57	9.236	0.1083	42.3	611.6	569.3	0.0962	1.2402	1.3364	**30.0**

TABLE 2.—Saturated Ammonia: Absolute Pressure Table—Continued.

Pressure (abs.). lbs./in.²	Temp. °F.	Volume vapor. ft.³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid. Btu./lb. °F.	Entropy. Evap. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Pressure (abs.). lbs./in.²
p	t	V	$1/V$	h	H	L	s	L/T	S	p
30	−0.57	9.236	0.1083	42.3	611.6	569.3	0.0962	1.2402	1.3364	**30**
31	+0.79	8.955	.1117	43.8	612.0	568.2	.0993	.2343	.3336	31
32	2.11	8.693	.1150	45.2	612.4	567.2	.1024	.2286	.3310	32
33	3.40	8.445	.1184	46.6	612.8	566.2	.1055	.2230	.3285	33
34	4.66	8.211	.1218	48.0	613.2	565.2	.1084	.2176	.3260	34
35	5.89	7.991	0.1251	49.3	613.6	564.3	0.1113	1.2123	1.3236	**35**
36	7.09	7.782	.1285	50.6	614.0	563.4	.1141	.2072	.3213	36
37	8.27	7.584	.1319	51.9	614.3	562.4	.1168	.2022	.3190	37
38	9.42	7.396	.1352	53.2	614.7	561.5	.1195	.1973	.3168	38
39	10.55	7.217	.1386	54.4	615.0	560.6	.1221	.1925	.3146	39
40	11.66	7.047	0.1419	55.6	615.4	559.8	0.1246	1.1879	1.3125	**40**
41	12.74	6.885	.1452	56.8	615.7	558.9	.1271	.1833	.3104	41
42	13.81	6.731	.1486	57.9	616.0	558.1	.1296	.1788	.3084	42
43	14.85	6.583	.1519	59.1	616.3	557.2	.1320	.1745	.3065	43
44	15.88	6.442	.1552	60.2	616.6	556.4	.1343	.1703	.3046	44
45	16.88	6.307	0.1586	61.3	616.9	555.6	0.1366	1.1661	1.3027	**45**
46	17.87	6.177	.1619	62.4	617.2	554.8	.1389	.1620	.3009	46
47	18.84	6.053	.1652	63.4	617.4	554.0	.1411	.1580	.2991	47
48	19.80	5.934	.1685	64.5	617.7	553.2	.1433	.1540	.2973	48
49	20.74	5.820	.1718	65.5	618.0	552.5	.1454	.1502	.2956	49
50	21.67	5.710	0.1751	66.5	618.2	551.7	0.1475	1.1464	1.2939	**50**
51	22.58	5.604	.1785	67.5	618.5	551.0	.1496	.1427	.2923	51
52	23.48	5.502	.1818	68.5	618.7	550.2	.1516	.1390	.2906	52
53	24.36	5.404	.1851	69.5	619.0	549.5	.1536	.1354	.2890	53
54	25.23	5.309	.1884	70.4	619.2	548.8	.1556	.1319	.2875	54
55	26.09	5.218	0.1917	71.4	619.4	548.0	0.1575	1.1284	1.2859	**55**
56	26.94	5.129	.1950	72.3	619.7	547.4	.1594	.1250	.2844	56
57	27.77	5.044	.1983	73.3	619.9	546.6	.1613	.1217	.2830	57
58	28.59	4.962	.2015	74.2	620.1	545.9	.1631	.1184	.2815	58
59	29.41	4.882	.2048	75.0	620.3	545.3	.1650	.1151	.2801	59
60	30.21	4.805	0.2081	75.9	620.5	544.6	0.1668	1.1119	1.2787	**60**
61	31.00	4.730	.2114	76.8	620.7	543.9	.1685	.1088	.2773	61
62	31.78	4.658	.2147	77.7	620.9	543.2	.1703	.1056	.2759	62
63	32.55	4.588	.2180	78.5	621.1	542.6	.1720	.1026	.2746	63
64	33.31	4.519	.2213	79.4	621.3	541.9	.1737	.0996	.2733	64
65	34.06	4.453	0.2245	80.2	621.5	541.3	0.1754	1.0966	1.2720	**65**
66	34.81	4.389	.2278	81.0	621.7	540.7	.1770	.0937	.2707	66
67	35.54	4.327	.2311	81.8	621.9	540.1	.1787	.0907	.2694	67
68	36.27	4.267	.2344	82.6	622.0	539.4	.1803	.0879	.2682	68
69	36.99	4.208	.2377	83.4	622.2	538.8	.1819	.0851	.2670	69
70	37.70	4.151	0.2409	84.2	622.4	538.2	0.1835	1.0823	1.2658	**70**
71	38.40	4.095	.2442	85.0	622.6	537.6	.1850	.0795	.2645	71
72	39.09	4.041	.2475	85.8	622.8	537.0	.1866	.0768	.2634	72
73	39.78	3.988	.2507	86.5	622.9	536.4	.1881	.0741	.2622	73
74	40.46	3.937	.2540	87.3	623.1	535.8	.1896	.0715	.2611	74
75	41.13	3.887	0.2573	88.0	623.2	535.2	0.1910	1.0689	1.2599	**75**
76	41.80	3.838	.2606	88.8	623.4	534.6	.1925	.0663	.2588	76
77	42.46	3.790	.2638	89.5	623.5	534.0	.1940	.0637	.2577	77
78	43.11	3.744	.2671	90.2	623.7	533.5	.1954	.0612	.2566	78
79	43.76	3.699	.2704	90.9	623.8	532.9	.1968	.0587	.2555	79
80	44.40	3.655	0.2736	91.7	624.0	532.3	0.1982	1.0563	1.2545	**80**

TABLE 2.—Saturated Ammonia: Absolute Pressure Table—Continued.

Pressure (abs.). lbs./in.² p	Temp. °F. t	Volume vapor. ft.³/lb. V	Density vapor. lbs./ft.³ $1/V$	Heat content. Liquid. Btu./lb. h	Heat content. Vapor. Btu./lb. H	Latent heat. Btu./lb. L	Entropy. Liquid. Btu./lb. °F. s	Entropy. Evap. Btu./lb.°F. L/T	Entropy. Vapor. Btu./lb.°F. S	Pressure (abs.). lbs./in.² p
80	44.40	3.655	0.2736	91.7	624.0	532.3	0.1982	1.0563	1.2545	**80**
81	45.03	3.612	.2769	92.4	624.1	531.7	.1996	.0538	.2534	81
82	45.66	3.570	.2801	93.1	624.3	531.2	.2010	.0514	.2524	82
83	46.28	3.528	.2834	93.8	624.4	530.6	.2024	.0490	.2514	83
84	46.89	3.488	.2867	94.5	624.6	530.1	.2037	.0467	.2504	84
85	47.50	3.449	0.2899	95.1	624.7	529.6	0.2051	1.0443	1.2494	**85**
86	48.11	3.411	.2932	95.8	624.8	529.0	.2064	.0420	.2484	86
87	48.71	3.373	.2964	96.5	625.0	528.5	.2077	.0397	.2474	87
88	49.30	3.337	.2997	97.2	625.1	527.9	.2090	.0375	.2465	88
89	49.89	3.301	.3030	97.8	625.2	527.4	.2103	.0352	.2455	89
90	50.47	3.266	0.3062	98.4	625.3	526.9	0.2115	1.0330	1.2445	**90**
91	51.05	3.231	.3095	99.1	625.5	526.4	.2128	.0308	.2436	91
92	51.62	3.198	.3127	99.8	625.6	525.8	.2141	.0286	.2427	92
93	52.19	3.165	.3160	100.4	625.7	525.3	.2153	.0265	.2418	93
94	52.76	3.132	.3192	101.0	625.8	524.8	.2165	.0243	.2408	94
95	53.32	3.101	0.3225	101.6	625.9	524.3	0.2177	1.0222	1.2399	**95**
96	53.87	3.070	.3258	102.3	626.1	523.8	.2190	.0201	.2391	96
97	54.42	3.039	.3290	102.9	626.2	523.3	.2201	.0181	.2382	97
98	54.97	3.010	.3323	103.5	626.3	522.8	.2213	.0160	.2373	98
99	55.51	2.980	.3355	104.1	626.4	522.3	.2225	.0140	.2365	99
100	56.05	2.952	0.3388	104.7	626.5	521.8	0.2237	1.0119	1.2356	**100**
102	57.11	2.896	.3453	105.9	626.7	520.8	.2260	.0079	.2339	102
104	58.16	2.843	.3518	107.1	626.9	519.8	.2282	.0041	.2323	104
106	59.19	2.791	.3583	108.3	627.1	518.8	.2305	1.0002	.2307	106
108	60.21	2.741	.3648	109.4	627.3	517.9	.2327	0.9964	.2291	108
110	61.21	2.693	0.3713	110.5	627.5	517.0	0.2348	0.9927	1.2275	**110**
112	62.20	2.647	.3778	111.7	627.7	516.0	.2369	.9890	.2259	112
114	63.17	2.602	.3843	112.8	627.9	515.1	.2390	.9854	.2244	114
116	64.13	2.559	.3909	113.9	628.1	514.2	.2411	.9819	.2230	116
118	65.08	2.517	.3974	114.9	628.2	513.3	.2431	.9784	.2215	118
120	66.02	2.476	0.4039	116.0	628.4	512.4	0.2452	0.9749	1.2201	**120**
122	66.94	2.437	.4104	117.1	628.6	511.5	.2471	.9715	.2186	122
124	67.86	2.399	.4169	118.1	628.7	510.6	.2491	.9682	.2173	124
126	68.76	2.362	.4234	119.1	628.9	509.8	.2510	.9649	.2159	126
128	69.65	2.326	.4299	120.1	629.0	508.9	.2529	.9616	.2145	128
130	70.53	2.291	0.4364	121.1	629.2	508.1	0.2548	0.9584	1.2132	**130**
132	71.40	2.258	.4429	122.1	629.3	507.2	.2567	.9552	.2119	132
134	72.26	2.225	.4494	123.1	629.5	506.4	.2585	.9521	.2106	134
136	73.11	2.193	.4559	124.1	629.6	505.5	.2603	.9490	.2093	136
138	73.95	2.162	.4624	125.1	629.8	504.7	.2621	.9460	.2081	138
140	74.79	2.132	0.4690	126.0	629.9	503.9	0.2638	0.9430	1.2068	**140**
142	75.61	2.103	.4755	126.9	630.0	503.1	.2656	.9400	.2056	142
144	76.42	2.075	.4820	127.9	630.2	502.3	.2673	.9371	.2044	144
146	77.23	2.047	.4885	128.8	630.3	501.5	.2690	.9342	.2032	146
148	78.03	2.020	.4951	129.7	630.4	500.7	.2707	.9313	.2020	148
150	78.81	1.994	0.5016	130.6	630.5	499.9	0.2724	0.9285	1.2009	**150**

TABLE 2.—Saturated Ammonia: Absolute Pressure Table—Continued.

Pressure (abs.). lbs./in.² p	Temp. °F. t	Volume vapor. ft.³/lb. V	Density vapor. lbs./ft.³ $1/V$	Heat content. Liquid. Btu./lb. h	Heat content. Vapor. Btu./lb. H	Latent heat. Btu./lb. L	Entropy. Liquid. Btu./lb. °F. s	Entropy. Evap. Btu./lb.°F. L/T	Entropy. Vapor. Btu./lb.°F. S	Pressure (abs.). lbs./in.² p
150	78. 81	1. 994	0. 5016	130. 6	630. 5	499. 9	0. 2724	0. 9285	1. 2009	**150**
152	79. 60	1. 968	. 5081	131. 5	630. 6	499. 1	. 2740	. 9257	. 1997	152
154	80. 37	1. 943	. 5147	132. 4	630. 7	498. 3	. 2756	. 9229	. 1985	154
156	81. 13	1. 919	. 5212	133. 3	630. 9	497. 6	. 2772	. 9202	. 1974	156
158	81. 89	1. 895	. 5277	134. 2	631. 0	496. 8	. 2788	. 9175	. 1963	158
160	82. 64	1. 872	0. 5343	135. 0	631. 1	496. 1	0. 2804	0. 9148	1. 1952	**160**
162	83. 39	1. 849	. 5408	135. 9	631. 2	495. 3	. 2820	. 9122	. 1942	162
164	84. 12	1. 827	. 5473	136. 8	631. 3	494. 5	. 2835	. 9096	. 1931	164
166	84. 85	1. 805	. 5539	137. 6	631. 4	493. 8	. 2850	. 9070	. 1920	166
168	85. 57	1. 784	. 5604	138. 4	631. 5	493. 1	. 2866	. 9044	. 1910	168
170	86. 29	1. 764	0. 5670	139. 3	631. 6	492. 3	0. 2881	0. 9019	1. 1900	**170**
172	87. 00	1. 744	. 5735	140. 1	631. 7	491. 6	. 2895	. 8994	. 1889	172
174	87. 71	1. 724	. 5801	140. 9	631. 7	490. 8	. 2910	. 8969	. 1879	174
176	88. 40	1. 705	. 5866	141. 7	631. 8	490. 1	. 2925	. 8944	. 1869	176
178	89. 10	1. 686	. 5932	142. 5	631. 9	489. 4	. 2939	. 8920	. 1859	178
180	89. 78	1. 667	0. 5998	143. 3	632. 0	488. 7	0. 2954	0. 8896	1. 1850	**180**
182	90. 46	1. 649	. 6063	144. 1	632. 1	488. 0	. 2968	. 8872	. 1840	182
184	91. 14	1. 632	. 6129	144. 8	632. 1	487. 3	. 2982	. 8848	. 1830	184
186	91. 80	1. 614	. 6195	145. 6	632. 2	486. 6	. 2996	. 8825	. 1821	186
188	92. 47	1. 597	. 6261	146. 4	632. 3	485. 9	. 3010	. 8801	. 1811	188
190	93. 13	1. 581	0. 6326	147. 2	632. 4	485. 2	0. 3024	0. 8778	1. 1802	**190**
192	93. 78	1. 564	. 6392	147. 9	632. 4	484. 5	. 3037	. 8755	. 1792	192
194	94. 43	1. 548	. 6458	148. 7	632. 5	483. 8	. 3050	. 8733	. 1783	194
196	95. 07	1. 533	. 6524	149. 5	632. 6	483. 1	. 3064	. 8710	. 1774	196
198	95. 71	1. 517	. 6590	150. 2	632. 6	482. 4	. 3077	. 8688	. 1765	198
200	96. 34	1. 502	0. 6656	150. 9	632. 7	481. 8	0. 3090	1. 8666	1. 1756	**200**
205	97. 90	1. 466	. 6821	152. 7	632. 8	480. 1	. 3122	. 8612	. 1734	205
210	99. 43	1. 431	. 6986	154. 6	633. 0	478. 4	. 3154	. 8559	. 1713	210
215	100. 94	1. 398	. 7152	156. 3	633. 1	476. 8	. 3185	. 8507	. 1692	215
220	102. 42	1. 367	. 7318	158. 0	633. 2	475. 2	. 3216	. 8455	. 1671	220
225	103. 87	1. 336	0. 7484	159. 7	633. 3	473. 6	0. 3246	0. 8405	1. 1651	**225**
230	105. 30	1. 307	. 7650	161. 4	633. 4	472. 0	. 3275	. 8356	. 1631	230
235	106. 71	1. 279	. 7817	163. 1	633. 5	470. 4	. 3304	. 8307	. 1611	235
240	108. 09	1. 253	. 7984	164. 7	633. 6	468. 9	. 3332	. 8260	. 1592	240
245	109. 46	1. 227	. 8151	166. 4	633. 7	467. 3	. 3360	. 8213	. 1573	245
250	110. 80	1. 202	0. 8319	168. 0	633. 8	465. 8	0. 3388	0. 8167	1. 1555	**250**
255	112. 12	1. 178	. 8487	169. 5	633. 8	464. 3	. 3415	. 8121	. 1536	255
260	113. 42	1. 155	. 8655	171. 1	633. 9	462. 8	. 3441	. 8077	. 1518	260
265	114. 71	1. 133	. 8824	172. 6	633. 9	461. 3	. 3468	. 8033	. 1501	265
270	115. 97	1. 112	. 8993	174. 1	633. 9	459. 8	. 3494	. 7989	. 1483	270
275	117. 22	1. 091	0. 9162	175. 6	634. 0	458. 4	0. 3519	0. 7947	1. 1466	**275**
280	118. 45	1. 072	. 9332	177. 1	634. 0	456. 9	. 3545	. 7904	. 1449	280
285	119. 66	1. 052	. 9502	178. 6	634. 0	455. 4	. 3569	. 7863	. 1432	285
290	120. 86	1. 034	. 9672	180. 0	634. 0	454. 0	. 3594	. 7821	. 1415	290
295	122. 05	1. 016	. 9843	181. 5	634. 0	452. 5	. 3618	. 7781	. 1399	295
300	123. 21	0. 999	1. 0015	182. 9	634. 0	451. 1	0. 3642	0. 7741	1. 1383	**300**

TABLE 3.—Saturated Ammonia: Gage Pressure Table.

Pressure. (gage). lbs./in.² *g. p.*	Temp. ° F. *t*	Volume vapor. ft.³/lb. *V*	Density vapor. lbs./ft.³ *1/V*	Heat content. Liquid. Btu./lb. *h*	Heat content. Vapor. Btu./lb. *H*	Latent heat. Btu./lb. *L*	Entropy. Liquid. Btu./lb.°F. *s*	Entropy. Evap. Btu./lb.°F. *L/T*	Entropy. Vapor. Btu./lb.°F. *S*	Pressure (gage). lbs./in.² *g. p.*
20*	−63. 9	50. 5	0. 0198	−25. 3	588. 0	613. 3	−0. 062	1. 550	1. 488	**20***
19*	−61. 0	46. 2	. 0217	−22. 3	589. 2	611. 5	− . 055	. 535	. 480	19*
18*	−58. 4	42. 6	. 0235	−19. 5	590. 3	609. 8	− . 048	. 521	. 473	18*
17*	−55. 9	39. 5	. 0253	−16. 9	591. 3	608. 2	− . 041	. 507	. 466	17*
16*	−53. 6	36. 8	. 0272	−14. 5	592. 2	606. 7	− . 035	. 495	. 460	16*
15*	−51. 4	34. 5	0. 0290	−12. 2	593. 1	605. 3	−0. 029	1. 483	1. 454	**15***
14*	−49. 4	32. 5	. 0308	−10. 0	593. 9	603. 9	− . 023	. 472	. 449	14*
13*	−47. 4	30. 7	. 0326	− 7. 9	594. 7	602. 6	− . 019	. 462	. 443	13*
12*	−45. 6	29. 1	. 0344	− 5. 9	595. 4	601. 3	− . 014	. 452	. 438	12*
11*	−43. 8	27. 6	. 0362	− 4. 0	596. 1	600. 1	− . 010	. 443	. 433	11*
10*	−42. 1	26. 3	0. 0380	− 2. 2	596. 8	599. 0	−0. 005	1. 434	1. 429	**10***
9*	−40. 4	25. 2	. 0397	− 0. 5	597. 4	597. 9	− . 001	. 426	. 425	9*
8*	−38. 9	24. 1	. 0415	+ 1. 2	598. 0	596. 8	+ . 003	. 418	. 421	8*
7*	−37. 3	23. 1	. 0433	2. 8	598. 6	595. 8	. 007	. 411	. 418	7*
6*	−35. 9	22. 2	. 0450	4. 4	599. 1	594. 7	. 010	. 405	. 415	6*
5*	−34. 5	21. 4	0. 0468	5. 9	599. 6	593. 7	0. 014	1. 397	1. 411	**5***
4*	−33. 1	20. 6	. 0485	7. 4	600. 2	592. 8	. 017	. 390	. 407	4*
3*	−31. 8	19. 9	. 0503	8. 8	600. 7	591. 9	. 020	. 384	. 404	3*
2*	−30. 5	19. 2	. 0520	10. 2	601. 2	591. 0	. 024	. 377	. 401	2*
1*	−29. 2	18. 6	. 0538	11. 5	601. 6	590. 1	. 027	. 371	. 398	1*
0	−28. 0	18. 0	0. 0555	12. 8	602. 1	589. 3	0. 030	1. 366	1. 396	**0**
1	−25. 6	16. 9	. 0590	15. 4	603. 0	587. 6	. 036	. 354	. 390	1
2	−23. 4	16. 0	. 0626	17. 8	603. 8	586. 0	. 041	. 344	. 385	2
3	−21. 2	15. 1	. 0661	20. 1	604. 6	584. 5	. 047	. 333	. 380	3
4	−19. 2	14. 4	. 0695	22. 3	605. 3	583. 0	. 052	. 324	. 376	4
5	−17. 2	13. 7	0. 0730	24. 4	606. 0	581. 6	0. 056	1. 315	1. 371	**5**
6	−15. 3	13. 1	. 0765	26. 4	606. 6	580. 2	. 061	. 306	. 367	6
7	−13. 5	12. 5	. 0799	28. 4	607. 3	578. 9	. 065	. 298	. 363	7
8	−11. 8	12. 0	. 0834	30. 3	607. 9	577. 6	. 070	. 290	. 360	8
9	−10. 1	11. 5	. 0868	32. 1	608. 4	576. 3	. 074	. 282	. 356	9
10	− 8. 4	11. 1	0. 0902	33. 8	609. 0	575. 2	0. 078	1. 275	1. 353	**10**
11	− 6. 9	10. 7	. 0937	35. 5	609. 5	574. 0	. 081	. 268	. 349	11
12	− 5. 3	10. 3	. 0971	37. 1	610. 0	572. 9	. 085	. 261	. 346	12
13	− 3. 8	9. 96	. 100	38. 8	610. 5	571. 7	. 088	. 255	. 343	13
14	− 2. 4	9. 63	. 104	40. 4	611. 0	570. 6	. 092	. 248	. 340	14
15	− 1. 0	9. 32	0. 107	41. 9	611. 4	569. 5	0. 095	1. 242	1. 337	**15**
16	+ 0. 4	9. 04	. 111	43. 4	611. 9	568. 5	. 098	. 236	. 334	16
17	1. 7	8. 78	. 114	44. 8	612. 3	567. 5	. 101	. 230	. 331	17
18	3. 0	8. 53	. 117	46. 2	612. 7	566. 5	. 104	. 225	. 329	18
19	4. 3	8. 28	. 121	47. 6	613. 1	565. 5	. 107	. 219	. 326	19
20	5. 5	8. 06	0. 124	48. 9	613. 5	564. 6	0. 110	1. 214	1. 324	**20**
21	6. 7	7. 85	. 127	50. 2	613. 9	563. 7	. 113	. 209	. 322	21
22	7. 9	7. 65	. 131	51. 5	614. 2	562. 7	. 116	. 204	. 320	22
23	9. 1	7. 46	. 134	52. 8	614. 6	561. 8	. 119	. 199	. 318	23
24	10. 2	7. 28	. 138	54. 0	614. 9	560. 9	. 121	. 194	. 315	24
25	11. 3	7. 11	0. 141	55. 3	615. 3	560. 0	0. 124	1. 189	1. 313	**25**
26	12. 4	6. 94	. 144	56. 5	615. 6	559. 1	. 126	. 185	. 311	26
27	13. 5	6. 78	. 148	57. 6	615. 9	558. 3	. 129	. 180	. 309	27
28	14. 5	6. 63	. 151	58. 8	616. 2	557. 4	. 131	. 176	. 307	28
29	15. 6	6. 49	. 154	59. 9	616. 5	556. 6	. 134	. 171	. 305	29
30	16. 6	6. 35	0. 158	61. 0	616. 8	555. 8	0. 136	1. 167	1. 303	**30**

* Inches of mercury below one standard atmosphere (29. 92 in.).

TABLE 3.—Saturated Ammonia: Gage Pressure Table—Continued.

Pressure. (gage). lbs./in.²	Temp. ° F.	Volume vapor. ft.³/lb.	Density vapor. lbs./ft.³	Heat content.		Latent heat. Btu./lb.	Entropy.			Pressure (gage). lbs./in.²
				Liquid. Btu./lb.	Vapor. Btu./lb.		Liquid. Btu./lb.°F.	Evap. Btu./lb.°F.	Vapor. Btu./lb.°F.	
g. p.	*t*	*V*	*1/V*	*h*	*H*	*L*	*s*	*L/T*	*S*	*g. p.*
30	16. 6	6. 35	0. 158	61. 0	616. 8	555. 8	0. 136	1. 167	1. 303	**30**
31	17. 6	6. 22	. 161	62. 1	617. 1	555. 0	. 138	. 163	. 301	31
32	18. 6	6. 09	. 164	63. 2	617. 4	554. 2	. 140	. 159	. 299	32
32	19. 5	5. 97	. 168	64. 2	617. 6	553. 4	. 143	. 155	. 298	33
34	20. 5	5. 85	. 171	65. 3	617. 9	552. 6	. 145	. 151	. 296	34
35	21. 4	5. 74	0. 174	66. 3	618. 2	551. 9	0. 147	1. 148	1. 295	**35**
36	22. 3	5. 64	. 177	67. 3	618. 4	551. 1	. 149	. 144	. 293	36
37	23. 2	5. 54	. 181	68. 3	618. 7	550. 4	. 151	. 140	. 291	37
38	24. 1	5. 44	. 184	69. 2	618. 9	549. 7	. 153	. 137	. 290	38
39	25. 0	5. 34	. 187	70. 2	619. 1	548. 9	. 155	. 133	. 288	39
40	25. 8	5. 25	0. 191	71. 2	619. 4	548. 2	0. 157	1. 130	1. 287	**40**
41	26. 7	5. 16	. 194	72. 1	619. 6	547. 5	. 159	. 126	. 285	41
42	27. 5	5. 07	. 197	73. 0	619. 8	546. 8	. 161	. 123	. 284	24
43	28. 3	4. 99	. 201	73. 9	620. 0	546. 1	. 163	. 119	. 282	43
44	29. 2	4. 91	. 204	74. 8	620. 3	545. 5	. 164	. 116	. 280	44
45	30. 0	4. 83	0. 207	75. 7	620. 5	544. 8	0. 166	1. 113	1. 279	**45**
46	30. 8	4. 76	. 210	76. 6	620. 7	544. 1	. 168	. 110	. 278	46
47	31. 5	4. 68	. 214	77. 4	620. 9	543. 5	. 170	. 107	. 277	47
48	32. 3	4. 61	. 217	78. 3	621. 1	542. 8	. 171	. 104	. 275	48
49	33. 1	4. 54	. 220	79. 1	621. 3	542. 2	. 173	. 101	. 274	49
50	33. 8	4. 48	0. 224	80. 0	621. 5	541. 5	0. 175	1. 098	1. 273	**50**
51	34. 6	4. 41	. 227	80. 8	621. 7	540. 9	. 177	. 095	. 272	51
52	35. 3	4. 35	. 230	81. 6	621. 8	540. 2	. 178	. 092	. 270	52
53	36. 1	4. 29	. 233	82. 4	622. 0	539. 6	. 180	. 089	. 269	53
54	36. 8	4. 23	. 237	83. 2	622. 2	539. 0	. 181	. 086	. 267	54
55	37. 5	4. 17	0. 240	84. 0	622. 4	538. 4	0. 183	1. 083	1. 266	**55**
56	38. 2	4. 12	. 243	84. 8	622. 5	537. 7	. 185	. 080	. 265	56
57	38. 9	4. 06	. 246	85. 6	622. 7	537. 1	. 186	. 078	. 264	57
58	39. 6	4. 01	. 250	86. 3	622. 9	536. 6	. 188	. 075	. 263	58
59	40. 3	3. 96	. 253	87. 0	623. 0	536. 0	. 189	. 072	. 261	59
60	40. 9	3. 91	0. 256	87. 8	623. 2	535. 4	0. 191	1. 069	1. 260	**60**
61	41. 6	3. 86	. 260	88. 6	623. 4	534. 8	. 192	. 067	. 259	61
62	42. 3	3. 81	. 263	89. 3	623. 5	534. 2	. 194	. 064	. 258	62
63	42. 9	3. 77	. 266	90. 0	623. 7	533. 7	. 195	. 062	. 257	63
64	43. 6	3. 72	. 269	90. 7	623. 8	533. 1	. 196	. 060	. 256	64
65	44. 2	3. 67	0. 273	91. 5	624. 0	532. 5	0. 198	1. 057	1. 255	**65**
66	44. 8	3. 63	. 276	92. 2	624. 1	531. 9	. 199	. 055	. 254	66
67	45. 5	3. 59	. 279	92. 9	624. 2	531. 3	. 201	. 052	. 253	67
68	46. 1	3. 55	. 282	93. 6	624. 4	530. 8	. 202	. 050	. 252	68
69	46. 7	3. 51	. 286	94. 3	624. 5	530. 2	. 203	. 048	. 251	69
70	47. 3	3. 47	0. 289	94. 9	624. 6	529. 7	0. 205	1. 045	1. 250	**70**
71	47. 9	3. 43	. 292	95. 6	624. 8	529. 2	. 206	. 043	. 249	71
72	48. 5	3. 39	. 295	96. 3	624. 9	528. 6	. 207	. 041	. 248	72
73	49. 1	3. 35	. 299	97. 0	625. 1	528. 1	. 209	. 038	. 247	73
74	49. 7	3. 32	. 302	97. 6	625. 2	527. 6	. 210	. 036	. 246	74
75	50. 3	3. 28	0. 305	98. 3	625. 3	527. 0	0. 211	1. 034	1. 245	**75**
76	50. 9	3. 24	. 308	98. 9	625. 4	526. 5	. 212	. 032	. 244	76
77	51. 5	3. 21	. 312	99. 5	625. 5	526. 0	. 214	. 029	. 243	77
78	52. 0	3. 17	. 315	100. 2	625. 7	525. 5	. 215	. 027	. 242	78
79	52. 6	3. 14	. 318	100. 8	625. 8	525. 0	. 216	. 025	. 241	79
80	53. 1	3. 11	0. 322	101. 5	625. 9	524. 4	0. 217	1. 023	1. 240	**80**

TABLE 3.—Saturated Ammonia: Gage Pressure Table—Continued.

Pressure (gage). lbs./in.²	Temp. °F.	Volume vapor. ft.³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid. Btu./lb.° F.	Entropy. Evap. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Pressure (gage). lbs./in.²
g. p.	*t*	*V*	*1/V*	*h*	*H*	*L*	*s*	*L/T*	*S*	*g. p.*
80	53. 1	3. 11	0. 322	101. 5	625. 9	524. 4	0. 217	1. 023	1. 240	**80**
81	53. 7	3. 08	. 325	102. 1	626. 0	523. 9	. 219	. 020	. 239	81
82	54. 3	3. 05	. 328	102. 7	626. 1	523. 4	. 220	. 018	. 238	82
83	54. 8	3. 02	. 331	103. 3	626. 3	523. 0	. 221	. 016	. 237	83
84	55. 3	2. 99	. 335	103. 9	626. 4	522. 5	. 222	. 015	. 237	84
85	55. 9	2. 96	0. 338	104. 5	626. 5	522. 0	0. 223	1. 013	1. 236	**85**
86	56. 4	2. 94	. 341	105. 1	626. 6	521. 5	. 224	. 011	. 235	86
87	57. 0	2. 91	. 344	105. 7	626. 7	521. 0	. 226	. 008	. 234	87
88	57. 5	2. 88	. 348	106. 3	626. 8	520. 5	. 227	. 006	. 233	88
89	58. 0	2. 85	. 351	106. 9	626. 9	520. 0	. 228	. 005	. 233	89
90	58. 5	2. 82	0. 354	107. 5	627. 0	519. 5	0. 229	1. 003	1. 232	**90**
91	59. 0	2. 80	. 357	108. 1	627. 1	519. 0	. 230	1. 001	. 231	91
92	59. 6	2. 77	. 361	108. 7	627. 2	518. 5	. 231	0. 999	. 230	92
93	60. 1	2. 75	. 364	109. 3	627. 3	518. 0	. 232	. 997	. 229	93
94	60. 6	2. 72	. 367	109. 8	627. 4	517. 6	. 233	. 995	. 228	94
95	61. 1	2. 70	0. 370	110. 4	627. 5	517. 1	0. 235	0. 993	1. 228	**95**
96	61. 6	2. 68	. 374	111. 0	627. 6	516. 6	. 236	. 991	. 227	96
97	62. 0	2. 65	. 377	111. 6	627. 7	516. 1	. 237	. 989	. 226	97
98	62. 5	2. 63	. 380	112. 1	627. 8	515. 7	. 238	. 988	. 226	98
99	63. 0	2. 61	. 383	112. 6	627. 9	515. 3	. 239	. 986	. 225	99
100	63. 5	2. 59	0. 287	113. 2	628. 0	514. 8	0. 240	0. 984	1. 224	**100**
102	64. 5	2. 54	. 393	114. 2	628. 1	513. 9	. 242	. 981	. 223	102
104	65. 4	2. 50	. 400	115. 3	628. 3	513. 0	. 244	. 977	. 221	104
106	66. 4	2. 46	. 406	116. 4	628. 5	512. 1	. 246	. 974	. 220	106
108	67. 3	2. 42	. 413	117. 4	628. 6	511. 2	. 248	. 970	. 218	108
110	68. 2	2. 39	0. 419	118. 5	628. 8	510. 3	0. 250	0. 967	1. 217	**110**
112	69. 1	2. 35	. 426	119. 5	628. 9	509. 4	. 252	. 964	. 216	112
114	70. 0	2. 31	. 432	120. 5	629. 1	508. 6	. 254	. 960	. 214	114
116	70. 8	2. 28	. 439	121. 5	629. 3	507. 8	. 256	. 957	. 213	116
118	71. 7	2. 25	. 445	122. 5	629. 4	506. 9	. 257	. 954	. 211	118
120	72. 6	2. 21	0. 452	123. 5	629. 5	506. 0	0. 259	0. 951	1. 210	**120**
122	73. 4	2. 18	. 458	124. 5	629. 7	505. 2	. 261	. 948	. 209	122
124	74. 2	2. 15	. 465	125. 4	629. 8	504. 4	. 263	. 945	. 208	124
126	75. 1	2. 12	. 471	126. 3	629. 9	503. 6	. 364	. 942	. 206	126
128	75. 9	2. 09	. 478	127. 3	630. 1	502. 8	. 266	. 939	. 205	128
130	76. 7	2. 06	0. 484	128. 2	630. 2	502. 0	0. 268	0. 936	1. 204	**130**
132	77. 5	2. 04	. 491	129. 1	630. 3	501. 2	. 270	. 933	. 203	132
134	78. 3	2. 01	. 497	130. 0	630. 4	500. 4	. 271	. 930	. 201	134
136	79. 1	1. 98	. 504	130. 9	630. 5	499. 6	. 273	. 927	. 200	136
138	79. 9	1. 96	. 510	131. 8	630. 7	498. 9	. 274	. 925	. 199	138
140	80. 6	1. 93	0. 517	132. 7	630. 8	498. 1	0. 276	0. 922	1. 198	**140**
142	81. 4	1. 91	. 523	133. 6	630. 9	497. 3	. 278	. 919	. 197	142
144	82. 2	1. 89	. 530	134. 5	631. 0	496. 5	. 279	. 917	. 196	144
146	82. 9	1. 86	. 536	135. 3	631. 1	495. 8	. 281	. 914	. 195	146
148	83. 6	1. 84	. 543	136. 2	631. 2	495. 0	. 283	. 911	. 194	148
150	84. 4	1. 82	0. 550	137. 0	631. 3	494. 3	0. 284	0. 909	1. 193	**150**

TABLE 3.—Saturated Ammonia: Gage Pressure Table—Continued.

Pressure (gage). lbs./in.²	Temp. °F.	Volume vapor. ft.³/lb.	Density vapor. lbs./ft.³	Heat content. Liquid. Btu./lb.	Heat content. Vapor. Btu./lb.	Latent heat. Btu./lb.	Entropy. Liquid Btu./lb. °F.	Entropy. Evap. Btu./lb.°F.	Entropy. Vapor. Btu./lb.°F.	Pressure (gage). lbs./in.²
g. p.	*t*	*V*	*1/V*	*h*	*H*	*L*	*s*	*L/T*	*S*	*g. p.*
150	84.4	1.82	0.550	137.0	631.3	494.3	0.284	0.909	1.193	**150**
152	85.1	1.80	.556	137.9	631.4	493.5	.286	.906	.192	152
154	85.8	1.78	.563	138.7	631.5	492.8	.287	.904	.191	154
156	86.5	1.76	.569	139.5	631.6	492.1	.289	.901	.190	156
158	87.2	1.74	.576	140.3	631.7	491.4	.290	.899	.189	158
160	88.0	1.72	0.582	141.1	631.8	490.7	0.292	0.896	1.188	**160**
162	88.6	1.70	.589	141.9	631.9	490.0	.293	.894	.187	162
164	89.3	1.68	.595	142.7	631.9	489.2	.294	.891	.185	164
166	90.0	1.66	.602	143.5	632.0	488.5	.296	.889	.185	166
168	90.7	1.64	.609	144.3	632.1	487.8	.297	.886	.183	168
170	91.4	1.62	0.615	145.1	632.1	487.0	0.299	0.884	1.183	**170**
172	92.0	1.61	.622	145.8	632.2	486.4	.300	.882	.182	172
174	92.7	1.59	.628	146.6	632.3	485.7	.302	.879	.181	174
176	93.4	1.57	.635	147.4	632.4	485.0	.303	.877	.180	176
178	94.0	1.56	.641	148.2	632.5	484.3	.304	.875	.179	178
180	94.7	1.54	0.648	148.9	632.5	483.6	0.305	0.873	1.178	**180**
182	95.3	1.53	.655	149.7	632.6	482.9	.307	.870	.177	182
184	95.9	1.51	.661	150.5	632.7	482.2	.308	.868	.176	184
186	96.6	1.50	.668	151.2	632.7	481.5	.309	.866	.175	186
188	97.2	1.48	.674	151.9	632.8	480.9	.311	.863	.174	188
190	97.8	1.47	0.681	152.6	632.8	480.2	0.312	0.861	1.173	**190**
192	98.4	1.45	.688	153.4	632.9	479.5	.314	.859	.173	192
194	99.0	1.44	.694	154.0	632.9	478.9	.315	.857	.172	194
196	99.7	1.43	.701	154.8	633.0	478.2	.316	.855	.171	196
198	100.3	1.41	.708	155.5	633.0	477.5	.317	.853	.170	198
200	100.9	1.40	0.714	156.2	633.1	476.9	0.318	0.851	1.169	**200**
205	102.3	1.37	.731	158.0	633.2	475.2	.321	.846	.167	205
210	103.8	1.34	.747	159.6	633.3	473.7	.324	.841	.165	210
215	105.2	1.31	.764	161.3	633.4	472.1	.327	.836	.163	215
220	106.6	1.28	.781	163.0	633.5	470.5	.330	.831	.161	220
225	108.0	1.25	0.797	164.6	633.6	469.0	0.333	0.826	1.159	**225**
230	109.4	1.23	.814	166.3	633.7	467.4	.336	.822	.158	230
235	110.7	1.20	.831	167.9	633.8	465.9	.339	.817	.156	235
240	112.0	1.18	.848	169.4	633.8	464.4	.341	.813	.154	240
245	113.3	1.16	.864	171.0	633.9	462.9	.344	.808	.152	245
250	114.6	1.13	0.881	172.6	633.9	461.3	0.346	0.804	1.150	**250**
255	115.9	1.11	.898	174.1	634.0	459.9	.349	.799	.148	255
260	117.1	1.09	.915	175.6	634.0	458.4	.352	.795	.147	260
265	118.4	1.07	.932	177.0	634.0	457.0	.354	.791	.145	265
270	119.6	1.05	.949	178.5	634.0	455.5	.357	.786	.143	270
275	120.8	1.03	0.966	179.9	634.0	454.1	0.359	0.783	1.142	**275**
280	122.0	1.02	.983	181.4	634.0	452.6	.362	.778	.140	280
285	123.1	1.00	1.000	182.8	634.0	451.2	.364	.774	.138	285
290	124.3	0.98	1.018	184.2	634.0	449.8	.367	.770	.137	290
295	125.4	0.97	1.035	185.6	634.0	448.4	.369	.766	.135	295
300	126.5	0.95	1.052	187.0	633.9	446.9	0.371	0.762	1.133	**300**

TABLE 4.—Properties of Liquid Ammonia.

Temp. °F. t	Saturation. Pressure (abs.). lbs./in.² p	Volume. ft.³/lb. v	Density. lbs./ft.³ $\frac{1}{v}$	Specific heat. Btu./lb. °F. c	Heat content. Btu./lb. h	Latent heat. Btu./lb. L	Latent heat of pressure variation. $\frac{\text{Btu./lb.}}{\text{lb./in.}^2}$ l	Variation of h with p (t constant). $\frac{\text{Btu./lb.}}{\text{lb./in.}^2}$ $\left(\frac{\partial h}{\partial p}\right)_t$	Compressibility. per lb./in.²×10⁶ $-\frac{1}{v}\left(\frac{\partial v}{\partial p}\right)_t$	Temp. °F. t
Triple point.	0. 88*	0. 01961*	51. 00*	.....	.....	.....	.....	.....	.....	.....
	0. 88	. 02182	45. 83	.....	.....	.....	.....	.....	.....	−107. 86
−100	1. 24	0. 02197	45. 52	(1. 040)	(−63. 0)	(633)	.....	.....	.....	**−100**
−95	1. 52	. 02207	45. 32	(1. 042)	(−57. 8)	(631)	.....	.....	.....	−95
−90	1. 86	. 02216	45. 12	(1. 043)	(−52. 6)	(628)	.....	.....	.....	−90
−85	2. 27	. 02226	44. 92	(1. 045)	(−47. 4)	(625)	.....	.....	.....	−85
−80	2. 74	. 02236	44. 72	(1. 046)	(−42. 2)	(622)	.....	.....	.....	−80
−75	3. 29	0. 02246	44. 52	(1. 048)	(−36. 9)	(619)	.....	.....	.....	**−75**
−70	3. 94	. 02256	44. 32	(1. 050)	(−31. 7	(616)	.....	.....	.....	−70
−65	4. 69	. 02267	44. 11	(1. 052)	(−26. 4)	(613)	.....	.....	.....	−65
−60	5. 55	. 02278	43. 91	1. 054	−21. 18	610. 8	−0. 0016	0. 0026	4. 4	−60
−55	6. 54	. 02288	43. 70	1. 056	−15. 90	607. 5	−. 0016	. 0026	4. 5	−55
−50	7. 67	0. 02299	43. 49	1. 058	−10. 61	604. 3	−0. 0017	0. 0026	4. 6	**−50**
−45	8. 95	. 02310	43. 28	1. 060	−5. 31	600. 9	−. 0017	. 0026	4. 7	−45
−40	10. 41	. 02322	43. 08	1. 062	0. 00	597. 6	−. 0018	. 0025	4. 8	−40
−35	12. 05	. 02333	42. 86	1. 064	+5. 32	594. 2	−. 0018	. 0025	5. 0	−35
−30	13. 90	. 02345	42. 65	1. 066	10. 66	590. 7	−. 0019	. 0025	5. 1	−30
−25	15. 98	0. 02357	42. 44	1. 068	16. 00	587. 2	−0. 0019	0. 0024	5. 2	**−25**
−20	18. 30	. 02369	42. 22	1. 070	21. 36	583. 6	−. 0020	. 0024	5. 4	−20
−15	20. 88	. 02381	42. 00	1. 073	26. 73	580. 0	−. 0020	. 0024	5. 5	−15
−10	23. 74	. 02393	41. 78	1. 075	32. 11	576. 4	−. 0021	. 0023	5. 7	−10
−5	26. 92	. 02406	41. 56	1. 078	37. 51	572. 6	−. 0022	. 0023	5. 8	−5
0	30. 42	0. 02419	41. 34	1. 080	42. 92	568. 9	−0. 0022	0. 0022	6. 0	**0**
5	34. 27	. 02432	41. 11	1. 083	48. 35	565. 0	−. 0023	. 0022	6. 2	5
10	38. 51	. 02446	40. 89	1. 085	53. 79	561. 1	−. 0024	. 0021	6. 4	10
15	43. 14	. 02460	40. 66	1. 088	59. 24	557. 1	−. 0025	. 0021	6. 6	15
20	48. 21	. 02474	40. 43	1. 091	64. 71	553. 1	−. 0025	. 0020	6. 8	20
25	53. 73	0. 02488	40. 20	1. 094	70. 20	548. 9	−0. 0026	0. 0020	7. 0	**25**
30	59. 74	. 02503	39. 96	1. 097	75. 71	544. 8	−. 0027	. 0019	7. 3	30
35	66. 26	. 02518	39. 72	1. 100	81. 23	540. 5	−. 0028	. 0019	7. 5	35
40	73. 32	. 02533	39. 49	1. 104	86. 77	536. 2	−. 0029	. 0018	7. 8	40
45	80. 96	. 02548	39. 24	1. 108	92. 34	531. 8	−. 0030	. 0017	8. 1	45
50	89. 19	0. 02564	39. 00	1. 112	97. 93	527. 3	−0. 0031	0. 0017	8. 4	**50**
55	98. 06	. 02581	38. 75	1. 116	103. 54	522. 8	−. 0032	. 0016	8. 8	55
60	107. 6	. 02597	38. 50	1. 120	109. 18	518. 1	−. 0033	. 0015	9. 1	60
65	117. 8	. 02614	38. 25	1. 125	114. 85	513. 4	−. 0034	. 0014	9. 5	65
70	128. 8	. 02632	38. 00	1. 129	120. 54	508. 6	−. 0035	. 0013	10. 0	70
75	140. 5	0. 02650	37. 74	1. 133	126. 25	503. 7	−0. 0037	0. 0012	10. 4	**75**

*Properties of solid ammonia at the triple point (−107.86 °F.)

TABLE 4.—Properties of Liquid Ammonia—Continued.

Temp. °F. t	Saturation. Pressure (abs.). lbs./in.² p	Volume. ft.³/lb. v	Density. lbs./ft.³ $\frac{1}{v}$	Specific heat. Btu./lb. °F c	Heat content. Btu./lb. h	Latent heat. Btu./lb. L	Latent heat of pressure variation. $\frac{\text{Btu./lb.}}{\text{lb./in.}^2}$ l	Variation of h with p (t constant). $\frac{\text{Btu./lb.}}{\text{lb./in.}^2}$ $\left(\frac{\partial h}{\partial p}\right)_t$	Compressibility. per lb./in.²×10⁶ $-\frac{1}{v}\left(\frac{\partial v}{\partial p}\right)_t$	Temp. °F. t
75	140. 5	0. 02650	37. 74	1. 133	126. 25	503. 7	−0. 0037	0. 0012	10. 4	**75**
80	153. 0	. 02668	37. 48	1. 138	131. 99	498. 7	− . 0038	. 0011	10. 9	80
85	166. 4	. 02687	37. 21	1. 142	137. 75	493. 6	− . 0040	. 0010	11. 4	85
90	180. 6	. 02707	36. 95	1. 147	143. 54	488. 5	− . 0041	. 0009	12. 0	90
95	195. 8	. 02727	36. 67	1. 151	149. 36	483. 2	− . 0043	. 0008	12. 6	95
100	211. 9	0. 02747	36. 40	1. 156	155. 21	477. 8	−0. 0045	0. 0006	13. 3	**100**
105	228. 9	. 02769	36. 12	1. 162	161. 09	472. 3	− . 0047	. 0005	14. 1	105
110	247. 0	. 02790	35. 84	1. 168	167. 01	466. 7	− . 0049	. 0003	14. 9	110
115	266. 2	. 02813	35. 55	1. 176	172. 97	460. 9	− . 0051	. 0001	15. 8	115
120	286. 4	. 02836	35. 26	1. 183	178. 98	455. 0	− . 0053	. 0000	16. 7	120
125	307. 8	0. 02860	34. 96	(1. 189)	(185)	(449)	.....	.....	.....	**125**
130	330. 3	. 02885	34. 66	(1. 197)	(191)	(443)	.....	.....	.....	130
135	354. 1	. 02911	34. 35	(1. 205)	(197)	(436)	.....	.....	.....	135
140	379. 1	. 02938	34. 04	(1. 213)	(203)	(430)	.....	.....	.....	140
145	405. 5	. 02966	33. 72	(1. 222)	(210)	(423)	.....	.....	.....	145
150	433. 2	0. 02995	33. 39	(1. 23)	(216)	(416)	.....	.....	.....	**150**
155	462. 3	. 03025	33. 06	(1. 24)	(222)	(409)	.....	.....	.....	155
160	492. 8	. 03056	32. 72	(1. 25)	(229)	(401)	.....	.....	.....	160
165	524. 8	. 03089	32. 37	(1. 26)	(235)	(394)	.....	.....	.....	165
170	558. 4	. 03124	32. 01	(1. 27)	(241)	(386)	.....	.....	.....	170
175	593. 5	0. 03160	31. 65	(1. 29)	(248)	(377)	.....	.....	.....	**175**
180	630. 3	. 03198	31. 27	(1. 30)	(255)	(369)	.....	.....	.....	180
185	668. 7	. 03238	30. 88	(1. 32)	(262)	(360)	.....	.....	.....	185
190	708. 9	. 03281	30. 48	(1. 34)	(269)	(351)	.....	.....	.....	190
195	750. 9	. 03326	30. 06	(1. 36)	(276)	(342)	.....	.....	.....	195
200	794. 7	0. 03375	29. 63	(1. 38)	(283)	(332)	.....	.....	.....	**200**
210	888. 1	. 03482	28. 72	(1. 43)	(297)	(310)	.....	.....	.....	210
220	989. 5	. 0361	27. 7	(1. 49)	(313)	(287)	.....	.....	.....	220
230	1099. 5	. 0376	26. 6	(1. 57)	(329)	(260)	.....	.....	.....	230
240	1218. 5	. 0395	25. 3	(1. 70)	(346)	(229)	.....	.....	.....	240
250	1347	. 0422	23. 7	(1. 90)	(365)	(192)	.....	.....	.....	**250**
260	1486	. 0463	21. 6	(2. 33)	(387)	(142)	.....	.....	.....	260
270	1635	. 0577	17. 3	(5. 30)	(419)	(52)	.....	.....	.....	270
Critical.	1657	. 0686	14. 6	∞	(433)	0	−∞	−∞	∞	271. 4

NOTE.—The figures in parentheses were calculated from empirical equations given in Bureau of Standards Scientific Papers Nos. 313 and 315 and represent values obtained by extrapolation beyond the range covered in the experimental work.

TABLE 5.—Properties of Superheated Ammonia Vapor.

V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	5 *−63.11°*			6 *−57.64°*			7 *−52.88°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*49.31*	*588.3*	*1.4857*	*41.59*	*590.6*	*1.4703*	*36.01*	*592.5*	*1.4574*	*Sat.*
−50	51.05	595.2	1.5025	42.44	594.6	1.4803	36.29	594.0	1.4611	**−50**
−40	52.36	600.3	.5149	43.55	599.8	.4928	37.25	599.3	.4739	−40
−30	53.67	605.4	.5269	44.64	604.9	.5049	38.19	604.5	.4861	−30
−20	54.97	610.4	.5385	45.73	610.0	.5166	39.13	609.6	.4979	−20
−10	56.26	615.4	.5498	46.82	615.1	.5280	40.07	614.7	.5094	−10
0	57.55	620.4	1.5608	47.90	620.1	1.5391	41.00	619.8	1.5206	**0**
10	58.84	625.4	.5716	48.98	625.2	.5499	41.93	624.9	.5314	10
20	60.12	630.4	.5821	50.05	630.2	.5605	42.85	629.9	.5421	20
30	61.41	635.4	.5925	51.12	635.2	.5708	43.77	635.0	.5525	30
40	62.69	640.4	.6026	52.19	640.2	.5810	44.69	640.0	.5627	40
50	63.96	645.5	1.6125	53.26	645.2	1.5910	45.61	645.0	1.5727	**50**
60	65.24	650.5	.6223	54.32	650.3	.6008	46.53	650.1	.5825	60
70	66.51	655.5	.6319	55.39	655.3	.6104	47.44	655.2	.5921	70
80	67.79	660.6	.6413	56.45	660.4	.6199	48.36	660.2	.6016	80
90	69.06	665.6	.6506	57.51	665.5	.6292	49.27	665.3	.6110	90
100	70.33	670.7	1.6598	58.58	670.6	1.6384	50.18	670.4	1.6202	**100**
110	71.60	675.8	.6689	59.64	675.7	.6474	51.09	675.5	.6292	110
120	72.87	680.9	.6778	60.70	680.8	.6563	52.00	680.7	.6382	120
130	74.14	686.1	.6865	61.76	685.9	.6651	52.91	685.8	.6470	130
140	75.41	691.2	.6952	62.82	691.1	.6738	53.82	691.0	.6557	140
150	76.68	696.4	1.7038	63.87	696.3	1.6824	54.73	696.2	1.6643	**150**
160	77.95	701.6	.7122	64.93	701.5	.6909	55.63	701.4	.6727	160
170	79.21	706.8	.7206	65.99	706.7	.6992	56.54	706.6	.6811	170
180	80.48	712.1	.7289	67.05	712.0	.7075	57.45	711.9	.6894	180
	10 *−41.34°*			11 *−38.14°*			12 *−35.16°*			
Sat.	*25.81*	*597.1*	*1.4276*	*23.61*	*598.3*	*1.4196*	*21.77*	*599.4*	*1.4124*	*Sat.*
−30	26.58	603.2	1.4420	24.12	602.7	1.4300	22.07	602.3	1.4190	−30
−20	27.26	608.5	.4542	24.74	608.1	.4423	22.64	607.7	.4314	−20
−10	27.92	613.7	.4659	25.35	613.3	.4542	23.20	613.0	.4434	−10
0	28.58	618.9	1.4773	25.95	618.5	1.4656	23.75	618.2	1.4549	**0**
10	29.24	624.0	.4884	26.55	623.7	.4768	24.31	623.4	.4661	10
20	29.90	629.1	.4992	27.15	628.9	.4876	24.86	628.6	.4770	20
30	30.55	634.2	.5097	27.74	634.0	.4982	25.41	633.7	.4877	30
40	31.20	639.3	.5200	28.34	639.1	.5085	25.95	638.9	.4980	40
50	31.85	644.4	1.5301	28.93	644.2	1.5187	26.49	644.0	1.5082	**50**
60	32.49	649.5	.5400	29.52	649.3	.5286	27.03	649.1	.5182	60
70	33.14	654.6	.5497	30.10	654.4	.5383	27.57	654.3	.5279	70
80	33.78	659.7	.5593	30.69	659.6	.5479	28.11	659.4	.5375	80
90	34.42	664.8	.5687	31.28	664.7	.5573	28.65	664.5	.5470	90
100	35.07	670.0	1.5779	31.86	669.8	1.5666	29.19	669.7	1.5562	**100**
110	35.71	675.1	.5870	32.44	675.0	.5757	29.72	674.8	.5654	110
120	36.35	680.3	.5960	33.03	680.1	.5847	30.26	680.0	.5744	120
130	36.99	685.4	.6049	33.61	685.3	.5936	30.79	685.2	.5833	130
140	37.62	690.6	.6136	34.19	690.5	.6023	31.33	690.4	.5920	140
150	38.26	695.8	1.6222	34.77	695.7	1.6109	31.86	695.6	1.6006	**150**
160	38.90	701.1	.6307	35.35	700.9	.6194	32.39	700.8	.6092	160
170	39.54	706.3	.6391	35.93	706.2	.6278	32.92	706.1	.6176	170
180	40.17	711.6	.6474	36.51	711.5	.6362	33.46	711.4	.6259	180
190	40.81	716.9	.6556	37.09	716.8	.6444	33.99	716.7	.6341	190
200	41.45	722.2	1.6637	37.67	722.1	1.6525	34.52	722.0	1.6422	**200**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	8 *−48.64°*			**9** *−44.38°*			**10** *−41.34°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*31.79*	*594.2*	*1.4462*	*28.48*	*595.7*	*1.4363*	*25.81*	*597 1*	*1.4276*	*Sat.*
−50	.....	.....	.....	.....	.....	.....	.....	.....	.....	**−50**
−40	32.52	598.8	1.4573	28.85	598.3	1.4426	25.90	597.8	1.4293	−40
−30	33.36	604.1	.4697	29.59	603.6	.4551	26.58	603.2	.4420	−30
−20	34.19	609.3	.4816	30.34	608.9	.4672	27.26	608.5	.4542	−20
−10	35.01	614.4	.4932	31.07	614.0	.4788	27.92	613.7	.4659	−10
0	35.83	619.5	1.5044	31.80	619.2	1.4902	28.58	618.9	1.4773	**0**
10	36.64	624.6	.5154	32.53	624.3	.5012	29.24	624.0	.4884	10
20	37.45	629.7	.5261	33.26	629.4	.5119	29.90	629.1	.4992	20
30	38.26	634.7	.5365	33.98	634.5	.5224	30.55	634.2	.5097	30
40	39.07	639.8	.5467	34.70	639.5	.5327	31.20	639.3	.5200	40
50	39.88	644.8	1.5568	35.42	644.6	1.5427	31.85	644.4	1.5301	**50**
60	40.68	649.9	.5666	36.13	649.7	.5526	32.49	649.5	.5400	60
70	41.48	655.0	.5763	36.85	654.8	.5623	33.14	654.6	.5497	70
80	42.28	660.1	.5858	37.56	659.9	.5718	33.78	659.7	.5593	80
90	43.08	665.2	.5952	38.27	665.0	.5812	34.42	664.8	.5687	90
100	43.88	670.3	1.6044	38.98	670.1	1.5904	35.07	670.0	1.5779	**100**
110	44.68	675.4	.6135	39.70	675.3	.5995	35.71	675.1	.5870	110
120	45.48	680.5	.6224	40.40	680.4	.6085	36.35	680.3	.5960	120
130	46.27	685.7	.6312	41.11	685.6	.6173	36.99	685.4	.6049	130
140	47.07	690.9	.6399	41.82	690.7	.6260	37.62	690.6	.6136	140
150	47.87	696.1	1.6485	42.53	695.9	1.6346	38.26	695.8	1.6222	**150**
160	48.66	701.3	.6570	43.24	701.2	.6431	38.90	701.1	.6307	160
170	49.46	706.5	.6654	43.95	706.4	.6515	39.54	706.3	.6391	170
180	50.25	711.8	.6737	44.65	711.7	.6598	40.17	711.6	.6474	180
	13 *−32.37°*			**14** *−29.76°*			**15** *−27.29°*			
Sat.	*20.20*	*600.5*	*1.4057*	*18.85*	*601.4*	*1.3996*	*17.67*	*602.4*	*1.3938*	*Sat.*
−30	20.33	601.8	1.4088	.....	.....	.....	.....	.....	.....	−30
−20	20.86	607.2	.4213	19.33	606.8	1.4119	18.01	606.4	1.4031	−20
−10	21.38	612.6	.4334	19.82	612.2	.4241	18.47	611.9	.4154	−10
0	21.90	617.9	1.4450	20.30	617.6	1.4358	18.92	617.2	1.4272	**0**
10	22.41	623.1	.4563	20.78	622.8	.4472	19.37	622.5	.4386	10
20	22.92	628.3	.4672	21.26	628.0	.4582	19.82	627.8	.4497	20
30	23.43	633.5	.4779	21.73	633.2	.4688	20.26	633.0	.4604	30
40	23.93	638.6	.4883	22.20	638.4	.4793	20.70	638.2	.4709	40
50	24.43	643.8	1.4985	22.67	643.6	1.4896	21.14	643.4	1.4812	**50**
60	24.94	648.9	.5085	23.14	648.7	.4996	21.58	648.5	.4912	60
70	25.43	654.1	.5183	23.60	653.9	.5094	22.01	653.7	.5011	70
80	25.93	659.2	.5279	24.06	659.0	.5191	22.44	658.9	.5108	80
90	26.43	664.4	.5374	24.53	664.2	.5285	22.88	664.0	.5203	90
100	26.93	669.5	1.5467	24.99	669.4	1.5378	23.31	669.2	1.5296	**100**
110	27.42	674.7	.5558	25.45	674.5	.5470	23.74	674.4	.5388	110
120	27.92	679.9	.5649	25.91	679.7	.5560	24.17	679.6	.5478	120
130	28.41	685.1	.5737	26.37	884.9	.5649	24.60	684.8	.5567	130
140	28.90	690.3	.5825	26.83	690.1	.5737	25.03	690.0	.5655	140
150	29.40	695.5	1.5911	27.29	695.4	1.5824	25.46	695.3	1.5742	**150**
160	29.89	700.7	.5997	27.74	700.6	.5909	25.88	700.5	.5827	160
170	30.38	706.0	.6081	28.20	705.9	.5993	26.31	705.8	.5911	170
180	30.87	711.3	.6164	28.66	711.2	.6076	26.74	711.1	.5995	180
190	31.36	716.6	.6246	29.11	716.5	.6159	27.16	716.4	.6077	190
200	31.85	721.9	1.6328	29.57	721.8	1.6240	27.59	721.7	1.6158	**200**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	15 *−27.29°*			**16** *−24.95°*			**17** *−22.73°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*17.67*	*602.4*	*1.3938*	*16.64*	*603.2*	*1.3885*	*15.72*	*604.0*	*1.3835*	*Sat.*
−20	18.01	606.4	1.4031	16.86	606.0	1.3948	15.83	605.6	1.3870	−20
−10	18.47	611.9	.4154	17.29	611.5	.4072	16.24	611.1	.3994	−10
0	18.92	617.2	1.4272	17.72	616.9	1.4191	16.65	616.6	1.4114	**0**
10	19.37	622.5	.4386	18.14	622.2	.4306	17.05	621.9	.4230	10
20	19.82	627.8	.4497	18.56	627.5	.4417	17.45	627.2	.4342	20
30	20.26	633.0	.4604	18.97	632.7	.4525	17.84	632.5	.4450	30
40	20.70	638.2	.4709	19.39	638.0	.4630	18.23	637.7	.4556	40
50	21.14	643.4	1.4812	19.80	643.2	1.4733	18.62	642.9	1.4659	**50**
60	21.58	648.5	.4912	20.21	648.3	.4834	19.01	648.1	.4761	60
70	22.01	653.7	.5011	20.62	653.5	.4933	19.39	653.3	.4860	70
80	22.44	658.9	.5108	21.03	658.7	.5030	19.78	658.5	.4957	80
90	22.88	664.0	.5203	21.43	663.9	.5125	20.16	663.7	.5052	90
100	23.31	669.2	1.5296	21.84	669.1	1.5218	20.54	668.9	1.5146	**100**
110	23.74	674.4	.5388	22.24	674.3	.5310	20.92	674.1	.5238	110
120	24.17	679.6	.5478	22.65	679.5	.5401	21.30	679.3	.5328	120
130	24.60	684.8	.5567	23.05	684.7	.5490	21.68	684.5	.5418	130
140	25.03	690.0	.5655	23.45	689.9	.5578	22.06	689.8	.5506	140
150	25.46	695.3	1.5742	23.86	695.1	1.5665	22.44	695.0	1.5593	**150**
160	25.88	700.5	.5827	24.26	700.4	.5750	22.82	700.3	.5678	160
170	26.31	705.8	.5911	24.66	705.7	.5835	23.20	705.6	.5763	170
180	26.74	711.1	.5995	25.06	711.0	.5918	23.58	710.9	.5846	180
190	27.16	716.4	.6077	25.46	716.3	.6001	23.95	716.2	.5929	190
200	27.59	721.7	1.6158	25.86	721.6	1.6082	24.33	721.5	1.6010	**200**
220	28.44	732.4	.6318	26.66	732.3	.6242	25.08	732.2	.6170	220
	20 *−16.64°*			**21** *−14.78°*			**22** *−12.98°*			
Sat.	*13.50*	*606.2*	*1.3700*	*12.90*	*606.8*	*1.3659*	*12.35*	*607.4*	*1.3621*	*Sat.*
−10	13.74	610.0	1.3784	13.06	609.6	1.3720	12.45	609.2	1.3659	−10
0	14.09	615.5	1.3907	13.40	615.2	1.3844	12.77	614.8	1.3784	**0**
10	14.44	621.0	.4025	13.73	620.7	.3962	13.09	620.4	.3903	10
20	14.78	626.4	.4138	14.06	626.1	.4077	13.40	625.8	.4018	20
30	15.11	631.7	.4248	14.38	631.5	.4187	13.71	631.2	.4129	30
40	15.45	637.0	.4356	14.70	636.8	.4295	14.02	636.6	.4237	40
50	15.78	642.3	1.4460	15.02	642.1	1.4400	14.32	641.9	1.4342	**50**
60	16.12	647.5	.4562	15.34	647.3	.4502	14.63	647.1	.4445	60
70	16.45	652.8	.4662	15.65	652.6	.4602	14.93	652.4	.4545	70
80	16.78	658.0	.4760	15.97	657.8	.4700	15.23	657.7	.4643	80
90	17.10	663.2	.4856	16.28	663.1	.4796	15.53	662.9	.4740	90
100	17.43	668.5	1.4950	16.59	668.3	1.4891	15.83	668.1	1.4834	**100**
110	17.76	673.7	.5042	16.90	673.5	.4983	16.12	673.4	.4927	110
120	18.08	678.9	.5133	17.21	678.8	.5075	16.42	678.6	.5019	120
130	18.41	684.2	.5223	17.52	684.0	.5165	16.72	683.9	.5109	130
140	18.73	689.4	.5312	17.83	689.3	.5253	17.01	689.2	.5197	140
150	19.05	694.7	1.5399	18.14	694.6	1.5340	17.31	694.4	1.5285	**150**
160	19.37	700.0	.5485	18.44	699.8	.5426	17.60	699.7	.5371	160
170	19.70	705.3	.5569	18.75	705.1	.5510	17.89	705.0	.5456	170
180	20.02	710.6	.5653	19.06	710.5	.5595	18.19	710.4	.5539	180
190	20.34	715.9	.5736	19.36	715.8	.5678	18.48	715.7	.5622	190
200	20.66	721.2	1.5817	19.67	721.1	1.5759	18.77	721.1	1.5704	**200**
220	21.30	732.0	.5978	20.28	731.9	.5920	19.35	731.8	.5865	220
240	21.94	742.8	.6135	20.89	742.7	.6077	19.94	742.7	.6022	240

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	18 *−20.61°*			19 *−18.58°*			20 *−16.64°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*14.90*	*604.8*	*1.3787*	*14.17*	*606.5*	*1.3742*	*13.50*	*606.2*	*1.3700*	*Sat.*
−20	14. 93	605. 1	1. 3795	.....	.....	.....	.....	.....	.....	−20
−10	15. 32	610. 7	. 3921	14. 49	610. 3	1. 3851	13. 74	610. 0	1. 3784	−10
0	15. 70	616. 2	1. 4042	14. 85	615. 9	1. 3973	14. 09	615. 5	1. 3907	**0**
10	16. 08	621. 6	. 4158	15. 21	621. 3	. 4090	14. 44	621. 0	. 4025	10
20	16. 46	626. 9	. 4270	15. 57	626. 7	. 4203	14. 78	626. 4	. 4138	20
30	16. 83	632. 2	. 4380	15. 93	632. 0	. 4312	15. 11	631. 7	. 4248	30
40	17. 20	637. 5	. 4486	16. 28	637. 3	. 4419	15. 45	637. 0	. 4356	40
50	17. 57	642. 7	1. 4590	16. 63	642. 5	1. 4523	15. 78	642. 3	1. 4460	**50**
60	17. 94	647. 9	. 4691	16. 98	647. 7	. 4625	16. 12	647. 5	. 4562	60
70	18. 30	653. 1	. 4790	17. 33	653. 0	. 4724	16. 45	652. 8	. 4662	70
80	18. 67	658. 4	. 4887	17. 67	658. 2	. 4822	16. 78	858. 0	. 4760	80
90	19. 03	663. 6	. 4983	18. 02	663. 4	. 4918	17. 10	663. 2	. 4856	90
100	19. 39	668. 8	1. 5077	18. 36	668. 6	1. 5012	17. 43	668. 5	1. 4950	**100**
110	19. 75	674. 0	. 5169	18. 70	673. 8	. 5104	17. 76	673. 7	. 5042	110
120	20. 11	679. 2	. 5260	19. 04	679. 1	. 5195	18. 08	678. 9	. 5133	120
130	20. 47	684. 4	. 5349	19. 38	684. 3	. 5285	18. 41	684. 2	. 5223	130
140	20. 83	689. 7	. 5438	19. 72	689. 5	. 5373	18. 73	689. 4	. 5312	140
150	21. 19	694. 9	1. 5525	20. 06	694. 8	1. 5460	19. 05	694. 7	1. 5399	**150**
160	21. 54	700. 2	. 5610	20. 40	700. 1	. 5546	19. 37	700. 0	. 5485	160
170	21. 90	705. 5	. 5695	20. 74	705. 4	. 5631	19. 70	705. 3	. 5569	170
180	22. 26	710. 8	. 5778	21. 08	710. 7	. 5714	20. 02	710. 6	. 5653	180
190	22. 61	716. 1	. 5861	21. 42	716. 0	. 5797	20. 34	715. 9	. 5736	190
200	22. 97	721. 4	1. 5943	21. 75	721. 3	1. 5878	20. 66	721. 2	1. 5817	**200**
220	23. 68	732. 2	. 6103	22. 43	732. 1	. 6039	21. 30	732. 0	. 5978	220
	23 *−11.25°*			24 *−9.58°*			25 *−7.96°*			
Sat.	*11.85*	*608.1*	*1.3584*	*11.39*	*608.6*	*1.3549*	*10.96*	*609.1*	*1.3515*	*Sat.*
−10	11. 89	608. 8	1. 3600	.....	.....	.....	.....	.....	.....	−10
0	12. 20	614. 5	1. 3726	11. 67	614. 1	1. 3670	11. 19	613. 8	1. 3616	**0**
10	12. 50	620. 0	. 3846	11. 96	619. 7	. 3791	11. 47	619. 4	. 3738	10
20	12. 80	625. 5	. 3961	12. 25	625. 2	. 3907	11. 75	625. 0	. 3855	20
30	13. 10	630. 9	. 4073	12. 54	630. 7	. 4019	12. 03	630. 4	. 3967	30
40	13. 40	636. 3	. 4181	12. 82	636. 1	. 4128	12. 30	635. 8	. 4077	40
50	13. 69	641. 6	1. 4287	13. 11	641. 4	1. 4234	12. 57	641. 2	1. 4183	50
60	13. 98	646. 9	. 4390	13. 39	646. 7	. 4337	12. 84	646. 5	. 4287	60
70	14. 27	652. 2	. 4491	13. 66	652. 0	. 4438	13. 11	651. 8	. 4388	70
80	14. 56	657. 5	. 4589	13. 94	657. 3	. 4537	13. 37	657. 1	. 4487	80
90	14. 84	662. 7	. 4686	14. 22	662. 6	. 4634	13. 64	662. 4	. 4584	90
100	15. 13	668. 0	1. 4780	14. 49	667. 8	1. 4729	13. 90	667. 7	1. 4679	**100**
110	15. 41	673. 2	. 4873	14. 76	673. 1	. 4822	14. 17	673. 0	. 4772	110
120	15. 70	678. 5	. 4965	15. 04	678. 4	. 4914	14. 43	678. 2	. 4864	120
130	15. 98	683. 8	. 5055	15. 31	683. 6	. 5004	14. 69	683. 5	. 4954	130
140	16. 26	689. 0	. 5144	15. 58	688. 9	. 5093	14. 95	688. 8	. 5043	140
150	16. 55	694. 3	1. 5231	15. 85	694. 2	1. 5180	15. 21	694. 1	1, 5131	**150**
160	16. 83	699. 6	. 5317	16. 12	699. 5	. 5266	15. 47	699. 4	. 5217	160
170	17. 11	704. 9	. 5402	16. 39	704. 8	. 5352	15. 73	704. 7	. 5303	170
180	17. 39	710. 3	. 5486	16. 66	710. 2	. 5436	15. 99	710. 1	. 5387	180
190	17. 67	715. 6	. 5569	16. 93	715. 5	. 5518	16. 25	715. 4	. 5470	190
200	17. 95	721. 0	1. 5651	17. 20	720. 9	1. 5600	16. 50	720. 8	1. 5552	**200**
220	18. 51	731. 7	. 5812	17. 73	731. 7	. 5761	17. 02	731. 6	. 5713	220
240	19. 07	742. 6	. 5969	18. 27	742. 6	. 5919	17. 53	742. 5	. 5870	240

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs. / in.² (Saturation temperature in italics.)									Temp. °F.
	25 *−7.96°*			26 *−6.39°*			27 *−4.87°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*10.96*	*609.1*	*1.3515*	*10.56*	*609.7*	*1.3482*	*10.20*	*610.2*	*1.3451*	*Sat.*
0	11.19	613.8	1.3616	10.74	613.4	1.3564	10.33	613.0	1.3513	**0**
10	11.47	619.4	.3738	11.01	619.1	.3686	10.59	618.8	.3637	10
20	11.75	625.0	.3855	11.28	624.7	.3804	10.85	624.4	.3755	20
30	12.03	630.4	.3967	11.55	630.2	.3917	11.11	629.9	.3869	30
40	12.30	635.8	.4077	11.81	635.6	.4027	11.37	635.4	.3979	40
50	12.57	641.2	1.4183	12.08	641.0	1.4134	11.62	640.8	1.4087	**50**
60	12.84	646.5	.4287	12.34	646.3	.4238	11.87	646.1	.4191	60
70	13.11	651.8	.4388	12.59	651.6	.4339	12.12	651.5	.4292	70
80	13.37	657.1	.4487	12.85	656.9	.4439	12.37	656.8	.4392	80
90	13.64	662.4	.4584	13.11	662.2	.4536	12.61	662.1	.4489	90
100	13.90	667.7	1.4679	13.36	667.5	1.4631	12.86	667.4	1.4585	**100**
110	14.17	673.0	.4772	13.61	672.8	.4725	13.10	672.7	.4679	110
120	14.43	678.2	.4864	13.87	678.1	.4817	13.34	678.0	.4771	120
130	14.69	683.5	.4954	14.12	683.4	.4907	13.59	683.3	.4861	130
140	14.95	688.8	.5043	14.37	688.7	.4996	13.83	688.6	.4950	140
150	15.21	694.1	1.5131	14.62	694.0	1.5084	14.07	693.9	1.5038	**150**
160	15.47	699.4	.5217	14.87	699.3	.5170	14.31	699.2	.5125	160
170	15.73	704.7	.5303	15.12	704.6	.5256	14.55	704.5	.5210	170
180	15.99	710.1	.5387	15.37	710.0	.5340	14.79	709.9	.5295	180
190	16.25	715.4	.5470	15.62	715.3	.5423	15.03	715.2	.5378	190
200	16.50	720.8	1.5552	15.86	720.7	1.5505	15.27	720.6	1.5460	**200**
220	17.02	731.6	.5713	16.36	731.5	.5666	15.75	731.4	.5621	220
240	17.53	742.5	.5870	16.85	742.4	.5824	16.23	742.3	.5779	240
260	18.04	753.4	.6025	17.35	753.3	.5978	16.70	753.2	.5933	260
	30 *−0.57°*			31 *+0.79°*			32 *+2.11°*			
Sat.	*9.236*	*611.6*	*1.3364*	*8.955*	*612.0*	*1.3336*	*8.693*	*612.4*	*1.3310*	*Sat.*
10	9.492	617.8	1.3497	9.173	617.4	1.3453	8.874	617.1	1.3411	10
20	9.731	623.5	.3618	9.405	623.2	.3574	9.099	622.9	.3532	20
30	9.966	629.1	.3733	9.633	628.8	.3691	9.321	628.5	.3649	30
40	10.20	634.6	.3845	9.858	634.4	.3803	9.540	634.1	.3762	40
50	10.43	640.1	1.3953	10.08	639.9	1.3912	9.757	639.6	1.3871	**50**
60	10.65	645.5	.4059	10.30	645.3	.4017	9.972	645.1	.3977	60
70	10.88	650.9	.4161	10.52	650.7	.4120	10.18	650.5	.4080	70
80	11.10	656.2	.4261	10.74	656.1	.4221	10.40	655.9	.4181	80
90	11.33	661.6	.4359	10.96	661.4	.4319	10.61	661.2	.4280	90
100	11.55	666.9	1.4456	11.17	666.7	1.4415	10.81	666.6	1.4376	**100**
110	11.77	672.2	.4550	11.38	672.1	.4510	11.02	671.9	.4470	110
120	11.99	677.5	.4642	11.60	677.4	.4602	11.23	677.3	.4563	120
130	12.21	682.9	.4733	11.81	682.7	.4693	11.44	682.6	.4655	130
140	12.43	688.2	.4823	12.02	688.1	.4783	11.64	687.9	.4744	140
150	12.65	693.5	1.4911	12.23	693.4	1.4871	11.85	693.3	1.4833	**150**
160	12.87	698.8	.4998	12.44	698.7	.4958	12.05	698.6	.4920	160
170	13.08	704.2	.5083	12.66	704.1	.5044	12.26	704.0	.5006	170
180	13.30	709.6	.5168	12.87	709.5	.5129	12.46	709.4	.5090	180
190	13.52	714.9	.5251	13.07	714.8	.5212	12.66	714.7	.5174	190
200	13.73	720.3	1.5334	13.28	720.2	1.5294	12.86	720.1	1.5256	**200**
220	14.16	731.1	.5495	13.70	731.1	.5456	13.27	731.0	.5418	220
240	14.59	742.0	.5653	14.12	742.0	.5614	13.67	741.9	.5576	240
260	15.02	753.0	.5808	14.53	752.9	.5769	14.08	752.9	.5731	260
280	15.45	764.1	.5960	14.95	764.0	.5921	14.48	763.9	.5883	280

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	28 *−3.40°*			**29** *−1.97°*			**30** *−0.57°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*9.853*	*610.7*	*1.3421*	*9.534*	*611.1*	*1.3392*	*9.236*	*611.6*	*1.3364*	*Sat.*
0	9. 942	612. 7	1. 3465	9. 584	612. 3	1. 3417	9. 250	611. 9	1. 3371	**0**
10	10. 20	618. 4	. 3589	9. 834	618. 1	. 3542	9. 492	617. 8	. 3497	10
20	10. 45	624. 1	. 3708	10. 08	623. 8	. 3662	9. 731	623. 5	. 3618	20
30	10. 70	629. 6	. 3822	10. 32	629. 4	. 3777	9. 966	629. 1	. 3733	30
40	10. 95	635. 1	. 3933	10. 56	634. 9	. 3888	10. 20	634. 6	. 3845	40
50	11. 19	640. 5	1. 4041	10. 80	640. 3	1. 3996	10. 43	640. 1	1. 3953	**50**
60	11. 44	645. 9	. 4145	11. 03	645. 7	. 4101	10. 65	645. 5	. 4059	60
70	11. 68	651. 2	. 4247	11. 26	651. 1	. 4204	10. 88	650. 9	. 4161	70
80	11. 92	656. 6	. 4347	11. 50	656. 4	. 4304	11. 10	656. 2	. 4261	80
90	12. 15	661. 9	. 4445	11. 73	661. 7	. 4401	11. 33	661. 6	. 4359	90
100	12. 39	667. 2	1. 4540	11. 96	667. 1	1. 4497	11. 55	666. 9	1. 4456	**100**
110	12. 63	672. 5	. 4634	12. 18	672. 4	. 4591	11. 77	672. 2	. 4550	110
120	12. 86	677. 8	. 4726	12. 41	677. 7	. 4684	11. 99	677. 5	. 4642	120
130	13. 10	683. 1	. 4817	12. 64	683. 0	. 4775	12. 21	682. 9	. 4733	130
140	13. 33	688. 4	. 4906	12. 86	688. 3	. 4864	12. 43	688. 2	. 4823	140
150	13. 56	693. 7	1. 4994	13. 09	693. 6	1. 4952	12. 65	693. 5	1. 4911	**150**
160	13. 80	699. 1	. 5081	13. 31	699. 0	. 5039	12. 87	698. 8	. 4998	160
170	14. 03	704. 4	. 5167	13. 54	704. 3	. 5124	13. 08	704. 2	. 5083	170
180	14. 26	709. 8	. 5251	13. 76	709. 7	. 5209	13. 30	709. 6	. 5168	180
190	14. 49	715. 1	. 5334	13. 99	715. 0	. 5292	13. 52	714. 9	. 5251	190
200	14. 72	720. 5	1. 5416	14. 21	720. 4	. 5374	13. 73	720. 3	1. 5334	**200**
220	15. 18	731. 3	. 5578	14. 65	731. 2	. 5536	14. 16	731. 1	. 5495	220
240	15. 64	742. 2	. 5736	15. 10	742. 2	. 5694	14. 59	742. 0	. 5653	240
260	16. 10	753. 2	. 5890	15. 54	753. 1	. 5848	15. 02	753. 0	. 5808	260
	33 *3.40°*			**34** *4.66°*			**35** *5.89°*			
Sat.	*8.445*	*612.8*	*1.3285*	*8.211*	*613.2*	*1.3260*	*7.991*	*613.6*	*1.3236*	*Sat.*
10	8. 592	616. 8	1. 3369	8. 328	616. 4	1. 3328	8. 078	616. 1	1. 3289	10
20	8. 812	622. 6	. 3492	8. 542	622. 3	. 3452	8. 287	622. 0	. 3413	20
30	9. 028	628. 3	. 3609	8. 753	628. 0	. 3570	8. 493	627. 7	. 3532	30
40	9. 242	633. 9	. 3722	8. 960	633. 6	. 3684	8. 695	633. 4	. 3646	40
50	9. 452	639. 4	1. 3832	9. 166	639. 2	1. 3793	8. 895	638. 9	1. 3756	**50**
60	9. 661	644. 9	. 3938	9. 369	644. 7	. 3900	9. 093	644. 4	. 3863	60
70	9. 868	650. 3	. 4042	9. 570	650. 1	. 4004	9. 289	649. 9	. 3967	70
80	10. 07	655. 7	. 4143	9. 770	655. 5	. 4105	9. 484	655. 3	. 4069	80
90	10. 28	661. 1	. 4241	9. 969	660. 9	. 4204	9. 677	660. 7	. 4168	90
100	10. 48	666. 4	1. 4338	10. 17	666. 3	1, 4301	9. 869	666. 1	1. 4265	**100**
110	10. 68	671. 8	. 4433	10. 36	671. 6	. 4396	10. 06	671. 5	. 4360	110
120	10. 88	677. 1	. 4526	10. 56	677. 0	. 4489	10. 25	676. 8	. 4453	120
130	11. 08	682. 5	. 4617	10. 75	682. 3	. 4581	10. 44	682. 2	. 4545	130
140	11. 28	687. 8	. 4707	10. 95	687. 7	. 4671	10. 63	687. 6	. 4635	140
150	11. 48	693. 2	1. 4795	11. 14	693. 0	1. 4759	10. 82	692. 9	1. 4724	**150**
160	11. 68	698. 5	. 4883	11. 33	698. 4	. 4846	11. 00	698. 3	. 4811	160
170	11. 88	703. 9	. 4968	11. 53	703. 8	. 4932	11. 19	703. 7	. 4897	170
180	12. 08	709. 3	. 5053	11. 72	709. 2	. 5017	11. 38	709. 1	. 4982	180
190	12. 27	714. 6	. 5137	11. 91	714. 5	. 5101	11. 56	714. 5	. 5066	190
200	12. 47	720. 0	1. 5219	12. 10	720. 0	1. 5183	11. 75	719. 9	1. 5148	**200**
220	12. 86	730. 9	. 5381	12. 48	730. 8	. 5346	12. 12	730. 7	. 5311	220
240	13. 26	741. 8	. 5540	12. 86	741. 7	. 5504	12. 49	741. 7	. 5469	240
260	13. 65	752. 8	. 5695	13. 24	752. 7	. 5659	12. 86	752. 7	. 5624	260
280	14. 04	763. 9	. 5846	13. 62	763. 8	. 5811	13. 23	763. 7	. 5776	280

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V= volume in ft.³/lb.; H= heat content in Btu./lb.; S= entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	35 *5.89°*			**36** *7.09°*			**37** *8.27°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*7.991*	*613.6*	*1.3236*	*7.782*	*614.0*	*1.3213*	*7.584*	*614.3*	*1.3190*	*Sat.*
10	8.078	616.1	1.3289	7.842	615.7	1.3250	7.619	615.4	1.3212	10
20	8.287	622.0	.3413	8.046	621.7	.3375	7.819	621.4	.3338	20
30	8.493	627.7	.3532	8.247	627.4	.3494	8.015	627.2	.3458	30
40	8.695	633.4	.3646	8.445	633.1	.3609	8.208	632.9	.3573	40
50	8.895	638.9	1.3756	8.640	638.7	1.3720	8.398	638.5	1.3684	**50**
60	9.093	644.4	.3863	8.833	644.2	.3827	8.587	644.0	.3792	60
70	9.289	649.9	.3967	9.024	649.7	.3932	8.773	649.5	.3897	70
80	9.484	655.3	.4069	9.214	655.2	.4033	8.958	655.0	.3999	80
90	9.677	660.7	.4168	9.402	660.6	.4133	9.142	660.4	.4098	90
100	9.869	666.1	1.4265	9.589	666.0	1.4230	9.324	665.8	1.4196	**100**
110	10.06	671.5	.4360	9.775	671.3	.4325	9.506	671.2	.4291	110
120	10.25	676.8	.4453	9.961	676.7	.4419	9.686	676.6	.4385	120
130	10.44	682.2	.4545	10.15	682.1	.4510	9.866	681.9	.4477	130
140	10.63	687.6	.4635	10.33	687.4	.4601	10.05	687.3	.4567	140
150	10.82	692.9	1.4724	10.51	692.8	1.4689	10.22	692.7	1.4656	**150**
160	11.00	698.3	.4811	10.69	698.2	.4777	10.40	698.1	.4744	160
170	11.19	703.7	.4897	10.88	703.6	.4863	10.58	703.5	.4830	170
180	11.38	709.1	.4982	11.06	709.0	.4948	10.76	708.9	.4915	180
190	11.56	714.5	.5066	11.24	714.4	.5032	10.93	714.3	.4999	190
200	11.75	719.9	1.5148	11.42	719.8	1.5115	11.11	719.7	1.5082	**200**
220	12.12	730.7	.5311	11.78	730.6	.5277	11.46	730.6	.5244	220
240	12.49	741.7	.5469	12.14	741.6	.5436	11.81	741.5	.5403	240
260	12.86	752.7	.5624	12.50	752.6	.5591	12.16	752.5	.5558	260
280	13.23	763.7	.5776	12.86	763.7	.5743	12.51	763.6	.5710	280
	40 *11.66°*			**42** *13.81°*			**44** *15.88°*			
Sat.	*7.047*	*615.4*	*1.3125*	*6.731*	*616.0*	*1.3084*	*6.442*	*616.6*	*1.3046*	*Sat.*
20	7.203	620.4	1.3231	6.842	619.8	1.3164	6.513	619.1	1.3099	20
30	7.387	626.3	.3353	7.019	625.8	.3287	6.683	625.2	.3224	30
40	7.568	632.1	.3470	7.192	631.6	.3405	6.850	631.1	.3343	40
50	7.746	637.8	1.3583	7.363	637.3	1.3519	7.014	636.8	1.3457	**50**
60	7.922	643.4	.3692	7.531	643.0	.3628	7.176	642.5	.3567	60
70	8.096	648.9	.3797	7.697	648.5	.3734	7.336	648.1	.3674	70
80	8.268	654.4	.3900	7.862	654.1	.3838	7.494	653.7	.3778	80
90	8.439	659.9	.4000	8.026	659.5	.3939	7.650	659.2	.3880	90
100	8.609	665.3	1.4098	8.188	665.0	1.4037	7.806	664.7	1.3978	**100**
110	8.777	670.7	.4194	8.349	670.4	.4133	7.960	670.1	.4075	110
120	8.945	676.1	.4288	8.510	675.9	.4228	8.114	675.6	.4170	120
130	9.112	681.5	.4381	8.669	681.3	.4320	8.267	681.0	.4263	130
140	9.278	686.9	.4471	8.828	686.7	.4411	8.419	686.4	.4354	140
150	9.444	692.3	1.4561	8.986	692.1	1.4501	8.570	691.9	1.4444	**150**
160	9.609	697.7	.4648	9.144	697.5	.4589	8.721	697.3	.4532	160
170	9.774	703.1	.4735	9.301	702.9	.4676	8.871	702.7	.4619	170
180	9.938	708.5	.4820	9.458	708.3	.4761	9.021	708.1	.4704	180
190	10.10	714.0	.4904	9.614	713.8	.4845	9.171	713.6	.4789	190
200	10.27	719.4	1.4987	9.770	719.2	1.4928	9.320	719.0	1.4872	**200**
220	10.59	730.3	.5150	10.08	730.1	.5091	9.617	730.0	.5035	220
240	10.92	741.3	.5309	10.39	741.1	.5251	9.913	741.0	.5195	240
260	11.24	752.3	.5465	10.70	752.2	.5406	10.21	752.0	.5350	260
280	11.56	763.4	.5617	11.01	763.3	.5559	10.50	763.1	.5503	280
300	11.88	774.6	.5766	11.31	774.5	1.5708	10.80	774.3	1.5652	**300**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	38 *9.42°*			**39** *10.55°*			**40** *11.66°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*7.396*	*614.7*	*1.3168*	*7.217*	*615.0*	*1.3146*	*7.047*	*615.4*	*1.3125*	*Sat.*
10	7.407	615.0	1.3175	.....	.....	.....	.....	.....	.....	10
20	7.603	621.0	.3301	7.398	620.7	1.3266	7.203	620.4	1.3231	20
30	7.795	626.9	.3422	7.586	626.6	.3387	7.387	626.3	.3353	30
40	7.983	632.6	.3538	7.770	632.4	.3504	7.568	632.1	.3470	40
50	8.170	638.3	1.3650	7.952	638.0	1.3616	7.746	637.8	1.3583	**50**
60	8.353	643.8	.3758	8.132	643.6	.3724	7.922	643.4	.3692	60
70	8.535	649.3	.3863	8.310	649.1	.3830	8.096	648.9	.3797	70
80	8.716	654.8	.3965	8.486	654.6	.3932	8.268	654.4	.3900	80
90	8.895	660.2	.4065	8.661	660.1	.4032	8.439	659.9	.4000	90
100	9.073	665.6	1.4163	8.835	665.5	1.4130	8.609	665.3	1.4098	**100**
110	9.250	671.0	.4258	9.008	670.9	.4226	8.777	670.7	.4194	110
120	9.426	676.4	.4352	9.179	676.3	.4320	8.945	676.1	.4288	120
130	9.602	681.8	.4444	9.351	681.7	.4412	9.112	681.5	.4381	130
140	9.776	687.2	.4534	9.521	687.1	.4503	9.278	686.9	.4471	140
150	9.950	692.6	1.4623	9.691	692.5	1.4592	9.444	692.3	1.4561	**150**
160	10.12	698.0	.4711	9.860	697.8	.4679	9.609	697.7	.4648	160
170	10.30	703.3	.4797	10.03	703.2	.4766	9.774	703.1	.4735	170
180	10.47	708.7	.4883	10.20	708.6	.4851	9.938	708.5	.4820	180
190	10.64	714.2	.4966	10.36	714.1	.4935	10.10	714.0	.4904	190
200	10.81	719.6	1.5049	10.53	719.5	1.5018	10.27	719.4	1.4987	**200**
220	11.16	730.5	.5212	10.87	730.4	.5181	10.59	730.3	.5150	220
240	11.50	741.4	.5371	11.20	741.3	.5340	10.92	741.3	.5309	240
260	11.84	752.4	.5526	11.53	752.4	.5495	11.24	752.3	.5465	260
280	12.18	763.5	.5678	11.86	763.5	.5647	11.56	763.4	.5617	280
	46 *17.87°*			**48** *19.80°*			**50** *21.67°*			
Sat.	*6.177*	*617.2*	*1.3009*	*5.934*	*617.7*	*1.2973*	*5.710*	*618.2*	*1.2939*	*Sat.*
20	6.213	618.5	1.3036	5.937	617.8	1.2976	.....	.....	.....	20
30	6.377	624.6	.3102	6.096	624.0	.3103	5.838	623.4	1.3046	30
40	6.538	630.5	.3283	6.251	630.0	.3225	5.988	629.5	.3169	40
50	6.696	636.4	1.3398	6.404	635.9	1.3341	6.135	635.4	1.3286	**50**
60	6.851	642.1	.3509	6.554	641.6	.3453	6.280	641.2	.3399	60
70	7.005	647.7	.3617	6.702	647.3	.3561	6.423	646.9	.3508	70
80	7.157	653.3	.3721	6.848	652.9	.3666	6.564	652.6	.3613	80
90	7.308	658.9	.3823	6.993	658.5	.3768	6.704	658.2	.3716	90
100	7.457	664.4	1.3922	7.137	664.0	1.3868	6.843	663.7	1.3816	**100**
110	7.605	669.8	.4019	7.280	669.5	.3965	6.980	669.2	.3914	110
120	7.753	675.3	.4114	7.421	675.0	.4061	7.117	674.7	.4009	120
130	7.899	680.7	.4207	7.562	680.5	.4154	7.252	680.2	.4103	130
140	8.045	686.2	.4299	7.702	685.9	.4246	7.387	685.7	.4195	140
150	8.190	691.6	1.4389	7.842	691.4	1.4336	7.521	691.1	1.4286	**150**
160	8.335	697.1	.4477	7.981	696.8	.4425	7.655	696.6	.4374	160
170	8.479	702.5	.4564	8.119	702.3	.4512	7.788	702.1	.4462	170
180	8.623	707.9	.4650	8.257	707.7	.4598	7.921	707.5	.4548	180
190	8.766	713.4	.4735	8.395	713.2	.4683	8.053	713.0	.4633	190
200	8.909	718.8	1.4818	8.532	718.7	1.4766	8.185	718.5	1.4716	**200**
220	9.194	729.8	.4981	8.805	729.6	.4930	8.448	729.4	.4880	220
240	9.477	740.8	.5141	9.077	740.6	.5090	8.710	740.5	.5040	240
260	9.760	751.9	.5297	9.348	751.7	.5246	8.970	751.6	.5197	260
280	10.04	763.0	.5450	9.619	762.9	.5399	9.230	762.7	.5350	280
300	10.32	774.2	1.5599	9.888	774.1	1.5548	9.489	774.0	1.5500	**300**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V= volume in ft.³/lb.; H= heat content in Btu./lb.; S= entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperatures in italics.)									Temp. °F.
	50 *21.67°*			**52** *23.48°*			**54** *25.23°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*5.710*	*618.2*	*1.2939*	*5.502*	*618.7*	*1.2906*	*5.309*	*619.2*	*1.2875*	*Sat.*
30	5.838	623.4	1.3046	5.599	622.8	1.2991	5.378	622.2	1.2937	30
40	5.988	629.5	.3169	5.744	629.0	.3114	5.519	628.4	.3062	40
50	6.135	635.4	1.3286	5.887	634.9	1.3233	5.657	634.4	1.3181	**50**
60	6.280	641.2	.3399	6.027	640.8	.3346	5.793	640.3	.3295	60
70	6.423	646.9	.3508	6.165	646.5	.3456	5.927	646.1	.3406	70
80	6.564	652.6	.3613	6.302	652.2	.3562	6.059	651.8	.3513	80
90	6.704	658.2	.3716	6.437	657.8	.3665	6.190	657.5	.3616	90
100	6.843	663.7	1.3816	6.571	663.4	1.3766	6.319	663.1	1.3717	**100**
110	6.980	669.2	.3914	6.704	668.9	.3864	6.447	668.6	.3816	110
120	7.117	674.7	.4009	6.835	674.4	.3960	6.575	674.2	.3912	120
130	7.252	680.2	.4103	6.966	679.9	.4054	6.701	679.7	.4006	130
140	7.387	685.7	.4195	7.096	685.4	.4146	6.827	685.2	.4099	140
150	7.521	691.1	1.4286	7.225	690.9	1.4237	6.952	690.7	1.4190	**150**
160	7.655	696.6	.4374	7.354	696.4	.4326	7.076	696.1	.4279	160
170	7.788	702.1	.4462	7.483	701.8	.4413	7.200	701.6	.4367	170
180	7.921	707.5	.4548	7.611	707.3	.4500	7.323	707.1	.4453	180
190	8.053	713.0	.4633	7.738	712.8	.4585	7.446	712.6	.4538	190
200	8.185	718.5	1.4716	7.865	718.3	1.4668	7.569	718.1	1.4622	**200**
210	8.317	724.0	.4799	7.992	723.8	.4751	7.691	723.6	.4705	210
220	8.448	729.4	.4880	8.118	729.3	.4833	7.813	729.1	.4787	220
240	8.710	740.5	.5040	8.370	740.3	.4993	8.056	740.2	.4947	240
260	8.970	751.6	.5197	8.621	751.4	.5149	8.298	751.3	.5104	260
280	9.230	762.7	1.5350	8.871	762.6	1.5303	8.539	762.5	1.5257	**280**
300	9.489	774.0	.5500	9.120	773.8	.5453	8.779	773.7	.5407	300
	60 *30.21°*			**62** *31.78°*			**64** *33.31°*			
Sat.	*4.805*	*620.5*	*1.2787*	*4.668*	*620.9*	*1.2759*	*4.519*	*621.3*	*1.2733*	*Sat.*
40	4.933	626.8	1.2913	4.762	626.2	1.2866	4.602	625.6	1.2820	40
50	5.060	632.9	1.3035	4.886	632.4	1.2989	4.723	631.9	1.2944	**50**
60	5.184	639.0	.3152	5.007	638.5	.3107	4.842	638.0	.3063	60
70	5.307	644.9	.3265	5.127	644.4	.3220	4.958	644.0	.3177	70
80	5.428	650.7	.3373	5.244	650.3	.3330	5.072	649.9	.3287	80
90	5.547	656.4	.3479	5.360	656.0	.3435	5.185	655.7	.3393	90
100	5.665	662.1	1.3581	5.474	661.7	1.3538	5.296	661.4	1.3496	**100**
110	5.781	667.7	.3681	5.588	667.4	.3638	5.406	667.1	.3597	110
120	5.897	673.3	.3778	5.700	673.0	.3736	5.516	672.7	.3695	120
130	6.012	678.9	.3873	5.811	678.6	.3831	5.624	678.3	.3791	130
140	6.126	684.4	.3966	5.922	684.2	.3925	5.731	683.9	.3885	140
150	6.239	689.9	1.4058	6.032	689.7	1.4017	5.838	689.5	1.3977	**150**
160	6.352	695.5	.4148	6.142	695.2	.4107	5.944	695.0	.4067	160
170	6.464	701.0	.4236	6.250	700.8	.4195	6.050	700.5	.4156	170
180	6.576	706.5	.4323	6.359	706.3	.4282	6.155	706.1	.4243	180
190	6.687	712.0	.4409	6.467	711.8	.4368	6.260	711.6	.4329	190
200	6.798	717.5	1.4493	6.574	717.3	1.4453	6.364	717.2	1.4413	**200**
210	6.909	723.1	.4576	6.681	722.9	.4536	6.468	722.7	.4497	210
220	7.019	728.6	.4658	6.788	728.4	.4618	6.572	728.3	.4579	220
230	7.129	734.1	.4739	6.895	734.0	.4699	6.675	733.8	.4660	230
240	7.238	739.7	.4819	7.001	739.5	.4779	6.778	739.4	.4741	240
260	7.457	750.9	1.4976	7.213	750.7	1.4937	6.984	750.6	1.4898	**260**
280	7.675	762.1	.5130	7.424	761.9	.5091	7.188	761.8	.5052	280
300	7.892	773.3	.5281	7.634	773.2	.5241	7.392	773.1	.5203	300

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	56 *26.94°*			**58** *28.59°*			**60** *30.21°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*5.129*	*619.7*	*1.2844*	*4.962*	*620.1*	*1.2815*	*4.805*	*620.5*	*1.2787*	*Sat.*
30	5.172	621.6	1.2884	4.981	621.0	1.2834	.....	.....	.....	30
40	5.310	627.9	.3011	5.115	627.3	.2961	4.933	626.8	1.2913	40
50	5.444	633.9	1.3131	5.245	633.4	1.3082	5.060	632.9	1.3035	**50**
60	5.576	639.9	.3246	5.373	639.4	.3199	5.184	639.0	.3152	60
70	5.706	645.7	.3357	5.499	645.3	.3310	5.307	644.9	.3265	70
80	5.834	651.4	.3465	5.624	651.1	.3418	5.428	650.7	.3373	80
90	5.960	657.1	.3569	5.746	656.8	.3523	5.547	656.4	.3479	90
100	6.085	662.7	1.3670	5.868	662.4	1.3625	5.665	662.1	1.3581	**100**
110	6.209	668.3	.3769	5.988	668.0	.3724	5.781	667.7	.3681	110
120	6.333	673.9	.3866	6.107	673.6	.3821	5.897	673.3	.3778	120
130	6.455	679.4	.3961	6.226	679.1	.3916	6.012	678.9	.3873	130
140	6.576	684.9	.4053	6.343	684.7	.4009	6.126	684.4	.3966	140
150	6.697	690.4	1.4144	6.460	690.2	1,4100	6.239	689.9	1.4058	**150**
160	6.817	695.9	.4234	6.577	695.7	.4190	6.352	695.5	.4148	160
170	6.937	701.4	.4322	6.692	701.2	.4278	6.464	701.0	.4236	170
180	7.056	706.9	.4408	6.808	706.7	.4365	6.576	706.5	.4323	180
190	7.175	712.4	.4494	6.923	712.2	.4450	6.687	712.0	.4409	190
200	7.294	717.9	1.4578	7.037	717.7	1.4535	6.798	717.5	1.4493	**200**
210	7.412	723.4	.4661	7.151	723.2	.4618	6.909	723.1	.4576	210
220	7.529	728.9	.4743	7.265	728.8	.4700	7.019	728.6	.4658	220
240	7.764	740.0	.4903	7.492	739.9	.4860	7.238	739.7	.4819	240
260	7.998	751.1	.5060	7.718	751.0	.5017	7.457	750.9	.4976	260
280	8.230	762.3	1.5213	7.943	762.2	.5171	7.675	762.1	1.5130	**280**
300	8.462	773.6	.5364	8.167	773.5	.5321	7.892	773.3	.5281	300
	66 *34.81°*			**68** *36.27°*			**70** *37.70°*			
Sat.	*4.389*	*621.7*	*1.2707*	*4.267*	*622.0*	*1.2682*	*4.151*	*622.4*	*1.2658*	*Sat.*
40	4.452	625.1	1.2775	4.310	624.5	1.2731	4.177	623.9	1.2688	40
50	4.570	631.4	1.2900	4.426	630.9	1.2858	4.290	630.4	1.2816	**50**
60	4.686	637.6	.3020	4.539	637.1	.2978	4.401	636.6	.2937	60
70	4.799	643.6	.3135	4.650	643.2	.3094	4.509	642.7	.3054	70
80	4.910	649.5	.3245	4.758	649.1	.3205	4.615	648.7	.3166	80
90	5.020	655.3	.3352	4.865	655.0	.3312	4.719	654.6	.3274	90
100	5.129	661.1	1.3456	4.971	660.7	1.3417	4.822	660.4	1.3378	**100**
110	5.236	666.8	.3557	5.075	666.5	.3518	4.924	666.1	.3480	110
120	5.342	672.4	.3655	5.179	672.1	.3617	5.025	671.8	.3579	120
130	5.447	678.0	.3751	5.281	677.8	.3713	5.125	677.5	.3676	130
140	5.552	683.6	.3846	5.383	683.4	.3807	5.224	683.1	.3770	140
150	5.656	689.2	1.3938	5.484	689.0	1.3900	5.323	688.7	1.3863	**150**
160	5.759	694.8	.4028	5.585	694.5	.3991	5.420	694.3	.3954	160
170	5.862	700.3	.4117	5.685	700.1	.4080	5.518	699.9	.4043	170
180	5.964	705.9	.4205	5.784	705.7	.4167	5.615	705.5	.4131	180
190	6.066	711.4	.4291	5.883	711.2	.4254	5.711	711.0	.4217	190
200	6.167	717.0	1.4375	5.982	716.8	1.4338	5.807	716.6	1.4302	**200**
210	6.268	722.5	.4459	6.080	722.3	.4422	5.902	722.2	.4386	210
220	6.369	728.1	.4541	6.179	727.9	.4505	5.998	727.7	.4469	220
230	6.470	733.7	.4623	6.275	733.5	.4586	6.093	733.3	.4550	230
240	6.570	739.2	.4703	6.373	739.1	.4666	6.187	738.9	.4631	240
260	6.769	750.4	1.4861	6.567	750.3	1.4824	6.376	750.1	1.4789	**260**
280	6.968	761.7	.5015	6.760	761.5	.4979	6.563	761.4	.4943	280
300	7.165	773.0	.5166	6.952	772.8	.5130	6.750	772.7	.5095	300

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	75 *41.13°*			**80** *44.40°*			**85** *47.50°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*3.887*	*623.2*	*1.2599*	*3.655*	*624.0*	*1.2545*	*3.449*	*624.7*	*1.2494*	*Sat.*
50	3.982	629.1	1.2715	3.712	627.7	1.2619	3.473	626.4	1.2527	**50**
60	4.087	635.5	.2839	3.812	634.3	.2745	3.569	633.0	.2656	60
70	4.189	641.7	.2957	3.909	640.6	.2866	3.662	639.5	.2779	70
80	4.289	647.7	.3071	4.005	646.7	.2981	3.753	645.7	.2896	80
90	4.388	653.7	.3180	4.098	652.8	.3092	3.842	651.8	.3008	90
100	4.485	659.6	1.3286	4.190	658.7	1.3199	3.930	657.8	1.3117	**100**
110	4.581	665.4	.3389	4.281	664.6	.3303	4.016	663.8	.3221	110
120	4.676	671.1	.3489	4.371	670.4	.3404	4.101	669.6	.3323	120
130	4.770	676.8	.3586	4.460	676.1	.3502	4.186	675.4	.3422	130
140	4.863	682.5	.3682	4.548	681.8	.3598	4.269	681.2	.3519	140
150	4.956	688.1	1.3775	4.635	687.5	1.3692	4.352	686.9	1.3614	**150**
160	5.048	693.7	.3866	4.722	693.2	.3784	4.434	692.6	.3706	160
170	5.139	699.3	.3956	4.808	698.8	.3874	4.515	698.2	.3797	170
180	5.230	704.9	.4044	4.893	704.4	.3963	4.596	703.9	.3886	180
190	5.320	710.5	.4131	4.978	710.0	.4050	4.677	709.5	.3974	190
200	5.410	716.1	1.4217	5.063	715.6	1.4136	4.757	715.2	1.4060	**200**
210	5.500	721.7	.4301	5.147	721.3	.4220	4.836	720.8	.4145	210
220	5.589	727.3	.4384	5.231	726.9	.4304	4.916	726.4	.4228	220
230	5.678	732.9	.4466	5.315	732.5	.4386	4.995	732.1	.4311	230
240	5.767	738.5	.4546	5.398	738.1	.4467	5.074	737.7	.4392	240
250	5.855	744.1	1.4625	5.482	743.8	1.4547	5.152	743.4	1.4472	**250**
260	5.943	749.8	.4705	5.565	749.4	.4626	5.230	749.0	.4551	260
280	6.119	761.1	.4860	5.730	760.7	.4781	5.386	760.4	.4707	280
300	6.294	772.4	.5011	5.894	772.1	.4933	5.541	771.8	.4859	300
	100 *56.05°*			**105** *58.67°*			**110** *61.21°*			
Sat.	*2.952*	*626.5*	*1.2356*	*2.817*	*627.0*	*1.2314*	*2.693*	*627.5*	*1.2275*	*Sat.*
70	3.068	636.0	1.2539	2.907	634.9	1.2464	2.761	633.7	1.2392	70
80	3.149	642.6	.2661	2.985	641.5	.2589	2.837	640.5	.2519	80
90	3.227	649.0	.2778	3.061	648.0	.2708	2.910	647.0	.2640	90
100	3.304	655.2	1.2891	3.135	654.3	1.2822	2.981	653.4	1.2755	**100**
110	3.380	661.3	.2999	3.208	660.5	.2931	3.051	659.7	.2866	110
120	3.454	667.3	.3104	3.279	666.6	.3037	3.120	665.8	.2972	120
130	3.527	673.3	.3206	3.350	672.6	.3139	3.188	671.9	.3076	130
140	3.600	679.2	.3305	3.419	678.5	.3239	3.255	677.8	.3176	140
150	3.672	685.0	1.3401	3.488	684.4	1.3336	3.321	683.7	1.3274	**150**
160	3.743	690.8	.3495	3.556	690.2	.3431	3.386	689.6	.3370	160
170	3.813	696.6	.3588	3.623	696.0	.3524	3.451	695.4	.3463	170
180	3.883	702.3	.3678	3.690	701.8	.3615	3.515	701.2	.3555	180
190	3.952	708.0	.3767	3.757	707.5	.3704	3.579	707.0	.3644	190
200	4.021	713.7	1.3854	3.823	713.3	1.3792	3.642	712.8	1.3732	**200**
210	4.090	719.4	.3940	3.888	719.0	.3878	3.705	718.5	.3819	210
220	4.158	725.1	.4024	3.954	724.7	.3963	3.768	724.3	.3904	220
230	4.226	730.8	.4108	4.019	730.4	.4046	3.830	730.0	.3988	230
240	4.294	736.5	.4190	4.083	736.1	.4129	3.892	735.7	.4070	240
250	4.361	742.2	1.4271	4.148	741.9	1.4210	3.954	741.5	1.4151	**250**
260	4.428	747.9	.4350	4.212	747.6	.4290	4.015	747.2	.4232	260
270	4.495	753.6	.4429	4.276	753.3	.4369	4.076	752.9	.4311	270
280	4.562	759.4	.4507	4.340	759.0	.4447	4.137	758.7	.4389	280
290	4.629	765.1	.4584	4.403	764.8	.4524	4.198	764.5	.4466	290
300	4.695	770.8	1.4660	4.466	770.5	1.4600	4.259	770.2	1.4543	**300**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	90 *50.47°*			**95** *53.32°*			**100** *56.05°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*3.266*	*625.3*	*1.2445*	*3.101*	*625.9*	*1.2399*	*2.952*	*626.5*	*1.2356*	*Sat.*
50										**50**
60	3.353	631.8	1.2571	3.160	630.5	1.2489	2.985	629.3	1.2409	60
70	3.442	638.3	.2695	3.245	637.2	.2616	3.068	636.0	.2539	70
80	3.529	644.7	.2814	3.329	643.6	.2736	3.149	642.6	.2661	80
90	3.614	650.9	.2928	3.411	649.9	.2852	3.227	649.0	.2778	90
100	3.698	657.0	1.3038	3.491	656.1	1.2963	3.304	655.2	1.2891	**100**
110	3.780	663.0	.3144	3.570	662.1	.3070	3.380	661.3	.2999	110
120	3.862	668.9	.3247	3.647	668.1	.3174	3.454	667.3	.3104	120
130	3.942	674.7	.3347	3.724	674.0	.3275	3.527	673.3	.3206	130
140	4.021	680.5	.3444	3.799	679.8	.3373	3.600	679.2	.3305	140
150	4.100	686.3	1.3539	3.874	685.6	1.3469	3.672	685.0	1.3401	**150**
160	4.178	692.0	.3633	3.949	691.4	.3562	3.743	690.8	.3495	160
170	4.255	697.7	.3724	4.022	697.1	.3654	3.813	696.6	.3588	170
180	4.332	703.4	.3813	4.096	702.8	.3744	3.883	702.3	.3678	180
190	4.408	709.0	.3901	4.168	708.5	.3833	3.952	708.0	.3767	190
200	4.484	714.7	1.3988	4.241	714.2	1.3919	4.021	713.7	1.3854	**200**
210	4.560	720.4	.4073	4.313	719.9	.4005	4.090	719.4	.3940	210
220	4.635	726.0	.4157	4.384	725.6	.4089	4.158	725.1	.4024	220
230	4.710	731.7	.4239	4.455	731.3	.4172	4.226	730.8	.4108	230
240	4.785	737.3	.4321	4.526	736.9	.4254	4.294	736.5	.4190	240
250	4.859	743.0	1.4401	4.597	742.6	1.4334	4.361	742.2	1.4271	**250**
260	4.933	748.7	.4481	4.668	748.3	.4414	4.428	747.9	.4350	260
280	5.081	760.0	.4637	4.808	759.7	.4570	4.562	759.4	.4507	280
300	5.228	771.5	.4789	4.947	771.2	.4723	4.695	770.8	.4660	300
	115 *63.65°*			**120** *66.02°*			**125** *68.31°*			
Sat.	*2.580*	*628.0*	*1.2237*	*2.476*	*628.4*	*1.2201*	*2.380*	*628.8*	*1.2166*	*Sat.*
70	2.628	632.5	1.2323	2.505	631.3	1.2255	2.392	630.0	1.2189	70
80	2.701	639.4	.2451	2.576	638.3	.2386	2.461	637.2	.2322	80
90	2.772	646.0	.2574	2.645	645.0	.2510	2.528	644.0	.2448	90
100	2.841	652.5	1.2690	2.712	651.6	1.2628	2.593	650.7	1.2568	**100**
110	2.909	658.8	.2802	2.778	658.0	.2741	2.657	657.1	.2682	110
120	2.975	665.0	.2910	2.842	664.2	.2850	2.719	663.5	.2792	120
130	3.040	671.1	.3015	2.905	670.4	.2956	2.780	669.7	.2899	130
140	3.105	677.2	.3116	2.967	676.5	.3058	2.840	675.8	.3002	140
150	3.168	683.1	1.3215	3.029	682.5	1.3157	2.900	681.8	1.3102	**150**
160	3.231	689.0	.3311	3.089	688.4	.3254	2.958	687.8	.3199	160
170	3.294	694.9	.3405	3.149	694.3	.3348	3.016	693.7	.3294	170
180	3.355	700.7	.3497	3.209	700.2	.3441	3.074	699.6	.3387	180
190	3.417	706.5	.3587	3.268	706.0	.3531	3.131	705.5	.3478	190
200	3.477	712.3	1.3675	3.326	711.8	1.3620	3.187	711.3	1.3567	**200**
210	3.538	718.1	.3762	3.385	717.6	.3707	3.243	717.2	.3654	210
220	3.598	723.8	.3847	3.442	723.4	.3793	3.299	723.0	.3740	220
230	3.658	729.6	.3931	3.500	729.2	.3877	3.354	728.8	.3825	230
240	3.717	735.3	.4014	3.557	734.9	.3960	3.409	734.5	.3908	240
250	3.776	741.1	1.4096	3.614	740.7	1.4042	3.464	740.3	1.3990	**250**
260	3.835	746.8	.4176	3.671	746.5	.4123	3.519	746.1	.4071	260
270	3.894	752.6	.4256	3.727	752.2	.4202	3.573	751.9	.4151	270
280	3.952	758.4	.4334	3.783	758.0	.4281	3.627	757.7	.4230	280
290	4.011	764.1	.4411	3.839	763.8	.4359	3.681	763.5	.4308	290
300	4.069	769.9	1.4488	3.895	769.6	1.4435	3.735	769.3	1.4385	**300**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	125 *68.31°*			**130** *70.53°*			**135** *72.69°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*2.380*	*628.8*	*1.2166*	*2.291*	*629.2*	*1.2132*	*2.209*	*629.6*	*1.2100*	*Sat.*
80	2.461	637.2	1.2322	2.355	636.0	1.2260	2.257	634.9	1.2199	80
90	2.528	644.0	.2448	2.421	643.0	.2388	2.321	642.0	.2329	90
100	2.593	650.7	1.2568	2.484	649.7	1.2509	2.382	648.8	1.2452	**100**
110	2.657	657.1	.2682	2.546	656.3	.2625	2.442	655.4	.2569	110
120	2.719	663.5	.2792	2.606	662.7	.2736	2.501	661.9	.2681	120
130	2.780	669.7	.2899	2.665	668.9	.2843	2.559	668.2	.2790	130
140	2.840	675.8	.3002	2.724	675.1	.2947	2.615	674.4	.2894	140
150	2.900	681.8	1.3102	2.781	681.2	1.3048	2.671	680.5	1.2996	**150**
160	2.958	687.8	.3199	2.838	687.2	.3146	2.726	686.6	.3094	160
170	3.016	693.7	.3294	2.894	693.2	.3241	2.780	692.6	.3191	170
180	3.074	699.6	.3387	2.949	699.1	.3335	2.834	698.6	.3284	180
190	3.131	705.5	.3478	3.004	705.0	.3426	2.887	704.5	.3376	190
200	3.187	711.3	1.3567	3.059	710.9	1.3516	2.940	710.4	1.3466	**200**
210	3.243	717.2	.3654	3.113	716.7	.3604	2.992	716.2	.3554	210
220	3.299	723.0	.3740	3.167	722.5	.3690	3.044	722.1	.3641	220
230	3.354	728.8	.3825	3.220	728.3	.3775	3.096	727.9	.3726	230
240	3.409	734.5	.3908	3.273	734.1	.3858	3.147	733.7	.3810	240
250	3.464	740.3	1.3990	3.326	739.9	1.3941	3.198	739.6	1.3893	**250**
260	3.519	746.1	.4071	3.379	745.7	.4022	3.249	745.4	.3974	260
270	3.573	751.9	.4151	3.431	751.5	.4102	3.300	751.2	.4054	270
280	3.627	757.7	.4230	3.483	757.3	.4181	3.350	757.0	.4133	280
290	3.681	763.5	.4308	3.535	763.1	.4259	3.400	762.8	.4212	290
300	3.735	769.3	1.4385	3.587	769.0	1.4336	3.450	768.6	1.4289	**300**
320	3.842	780.9	.4536	3.690	780.6	.4487	3.550	780.3	.4441	320
	150 *78.81°*			**160** *82.64°*			**170** *86.29°*			
Sat.	*1.994*	*630.5*	*1.2009*	*1.872*	*631.1*	*1.1952*	*1.764*	*631.6*	*1.1900*	*Sat.*
90	2.061	638.8	1.2161	1.914	636.6	1.2055	1.784	634.4	1.1952	90
100	2.118	645.9	1.2289	1.969	643.9	1.2186	1.837	641.9	1.2087	**100**
110	2.174	652.8	.2410	2.023	651.0	.2311	1.889	649.1	.2215	110
120	2.228	659.4	.2526	2.075	657.8	.2429	1.939	656.1	.2336	120
130	2.281	665.9	.2638	2.125	664.4	.2542	1.988	662.8	.2452	130
140	2.334	672.3	.2745	2.175	670.9	.2652	2.035	669.4	.2563	140
150	2.385	678.6	1.2849	2.224	677.2	1.2757	2.081	675.9	1.2669	**150**
160	2.435	684.8	.2949	2.272	683.5	.2859	2.127	682.3	.2773	160
170	2.485	690.9	.3047	2.319	689.7	.2958	2.172	688.5	.2873	170
180	2.534	696.9	.3142	2.365	695.8	.3054	2.216	694.7	.2971	180
190	2.583	702.9	.3236	2.411	701.9	.3148	2.260	700.8	.3066	190
200	2.631	708.9	1.3327	2.457	707.9	1.3240	2.303	706.9	1.3159	**200**
210	2.679	714.8	.3416	2.502	713.9	.3331	2.346	713.0	.3249	210
220	2.726	720.7	.3504	2.547	719.9	.3419	2.389	719.0	.3338	220
230	2.773	726.6	.3590	2.591	725.8	.3506	2.431	724.9	.3426	230
240	2.820	732.5	.3675	2.635	731.7	.3591	2.473	730.9	.3512	240
250	2.866	738.4	1.3758	2.679	737.6	1.3675	2.514	736.8	1.3596	**250**
260	2.912	744.3	.3840	2.723	743.5	.3757	2.555	742.8	.3679	260
270	2.958	750.1	.3921	2.766	749.4	.3838	2.596	748.7	.3761	270
280	3.004	756.0	.4001	2.809	755.3	.3919	2.637	754.6	.3841	280
290	3.049	761.8	.4079	2.852	761.2	.3998	2.678	760.5	.3921	290
300	3.095	767.7	1.4157	2.895	767.1	1.4076	2.718	766.4	1.3999	**300**
320	3.185	779.4	.4310	2.980	778.9	.4229	2.798	778.3	.4153	320
340	3.274	791.2	.4459	3.064	790.7	.4379	2.878	790.1	.4303	340

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V = volume in ft.³/lb.; H = heat content in Btu./lb.; S = entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	140 *74.79°*			145 *76.83°*			150 *78.81°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*2.132*	*629.9*	*1.2068*	*2.061*	*630.2*	*1.2038*	*1.994*	*630.5*	*1.2009*	*Sat.*
80	2.166	633.8	1.2140	2.080	632.6	1.2082	2.001	631.4	1.2025	80
90	2.228	640.9	.2272	2.141	639.9	.2216	2.061	638.8	.2161	90
100	2.288	647.8	1.2396	2.200	646.9	1.2342	2.118	645.9	1.2289	**100**
110	2.347	654.5	.2515	2.257	653.6	.2462	2.174	652.8	.2410	110
120	2.404	661.1	.2628	2.313	660.2	.2577	2.228	659.4	.2526	120
130	2.460	667.4	.2738	2.368	666.7	.2687	2.281	665.9	.2638	130
140	2.515	673.7	.2843	2.421	673.0	.2793	2.334	672.3	.2745	140
150	2.569	679.9	1.2945	2.474	679.2	1.2896	2.385	678.6	1.2849	**150**
160	2.622	686.0	.3045	2.526	685.4	.2996	2.435	684.8	.2949	160
170	2.675	692.0	.3141	2.577	691.4	.3093	2.485	690.9	.3047	170
180	2.727	698.0	.3236	2.627	697.5	.3188	2.534	696.9	.3142	180
190	2.779	704.0	.3328	2.677	703.4	.3281	2.583	702.9	.3236	190
200	2.830	709.9	1.3418	2.727	709.4	1.3372	2.631	708.9	1.3327	**200**
210	2.880	715.8	.3507	2.776	715.3	.3461	2.679	714.8	.3416	210
220	2.931	721.6	.3594	2.825	721.2	.3548	2.726	720.7	.3504	220
230	2.981	727.5	.3679	2.873	727.1	.3634	2.773	726.6	.3590	230
240	3.030	733.3	.3763	2.921	732.9	.3718	2.820	732.5	.3675	240
250	3.080	739.2	1.3846	2.969	738.8	1.3801	2.866	738.4	1.3758	**250**
260	3.129	745.0	.3928	3.017	744.6	.3883	2.912	744.3	.3840	260
270	3.179	750.8	.4008	3.064	750.5	.3964	2.958	750.1	.3921	270
280	3.227	756.7	.4088	3.111	756.3	.4043	3.004	756.0	.4001	280
290	3.275	762.5	.4166	3.158	762.2	.4122	3.049	761.8	.4079	290
300	3.323	768.3	1.4243	3.205	768.0	1.4199	3.095	767.7	1.4157	**300**
320	3.420	780.0	.4395	3.298	779.7	.4352	3.185	779.4	.4310	320
	180 *89.78°*			190 *93.13°*			200 *96.34°*			
Sat.	*1.667*	*632.0*	*1.1850*	*1.581*	*632.4*	*1.1802*	*1.502*	*632.7*	*1.1756*	*Sat.*
90	1.668	632.2	1.1853	.....	.....	.....	.....	.....	.....	90
100	1.720	639.9	1.1992	1.615	637.8	1.1899	1.520	635.6	1.1809	**100**
110	1.770	647.3	.2123	1.663	645.4	.2034	1.567	643.4	.1947	110
120	1.818	654.4	.2247	1.710	652.6	.2160	1.612	650.9	.2077	120
130	1.865	661.3	.2364	1.755	659.7	.2281	1.656	658.1	.2200	130
140	1.910	668.0	.2477	1.799	666.5	.2396	1.698	665.0	.2317	140
150	1.955	674.6	1.2586	1.842	673.2	1.2506	1.740	671.8	1.2429	**150**
160	1.999	681.0	.2691	1.884	679.7	.2612	1.780	678.4	.2537	160
170	2.042	687.3	.2792	1.925	686.1	.2715	1.820	684.9	.2641	170
180	2.084	693.6	.2891	1.966	692.5	.2815	1.859	691.3	.2742	180
190	2.126	699.8	.2987	2.005	698.7	.2912	1.897	697.7	.2840	190
200	2.167	705.9	1.3081	2.045	704.9	1.3007	1.935	703.9	1.2935	**200**
210	2.208	712.0	.3172	2.084	711.1	.3099	1.972	710.1	.3029	210
220	2.248	718.1	.3262	2.123	717.2	.3189	2.009	716.3	.3120	220
230	2.288	724.1	.3350	2.161	723.2	.3278	2.046	722.4	.3209	230
240	2.328	730.1	.3436	2.199	729.3	.3365	2.082	728.4	.3296	240
250	2.367	736.1	1.3521	2.236	735.3	1.3450	2.118	734.5	1.3382	**250**
260	2.407	742.0	.3605	2.274	741.3	.3534	2.154	740.5	.3467	260
270	2.446	748.0	.3687	2.311	747.3	.3617	2.189	746.5	.3550	270
280	2.484	753.9	.3768	2.348	753.2	.3698	2.225	752.5	.3631	280
290	2.523	759.9	.3847	2.384	759.2	.3778	2.260	758.5	.3712	290
300	2.561	765.8	1.3926	2.421	765.2	1.3857	2.295	764.5	1.3791	**300**
320	2.637	777.7	.4081	2.493	777.1	.4012	2.364	776.5	.3947	320
340	2.713	789.6	.4231	2.565	789.0	.4163	2.432	788.5	.4099	340

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °C.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	200 *96.34°*			**210** *99.43°*			**220** *102.42°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*1.502*	*632.7*	*1.1756*	*1.431*	*633.0*	*1.1713*	*1.367*	*633.2*	*1.1671*	*Sat.*
110	1.567	643.4	1.1947	1.480	641.5	1.1863	1.400	639.4	1.1781	110
120	1.612	650.9	.2077	1.524	649.1	.1996	1.443	647.3	.1917	120
130	1.656	658.1	.2200	1.566	656.4	.2121	1.485	654.8	.2045	130
140	1.698	665.0	.2317	1.608	663.5	.2240	1.525	662.0	.2167	140
150	1.740	671.8	1.2429	1.648	670.4	1.2354	1.564	669.0	1.2281	**150**
160	1.780	678.4	.2537	1.687	677.1	.2464	1.601	675.8	.2394	160
170	1.820	684.9	.2641	1.725	683.7	.2569	1.638	682.5	.2501	170
180	1.859	691.3	72742	1.762	690.2	.2672	1.675	689.1	.2604	180
190	1.897	697.7	.2840	1.799	696.6	.2771	1.710	695.5	.2704	190
200	1.935	703.9	1.2935	1.836	702.9	1.2867	1.745	701.9	1.2801	**200**
210	1.972	710.1	.3029	1.872	709.2	.2961	1.780	708.2	.2896	210
220	2.009	716.3	.3120	1.907	715.3	.3053	1.814	714.4	.2989	220
230	2.046	722.4	.3209	1.942	721.5	.3143	1.848	720.6	.3079	230
240	2.082	728.4	.3296	1.977	727.6	.3231	1.881	726.8	.3168	240
250	2.118	734.5	1.3382	2.011	733.7	1.3317	1.914	732.9	1.3255	**250**
260	2.154	740.5	.3467	2.046	739.8	.3402	1.947	739.0	.3340	260
270	2.189	746.5	.3550	2.080	745.8	.3486	1.980	745.1	.3424	270
280	2.225	752.5	.3631	2.113	751.8	.3568	2.012	751.1	.3507	280
290	2.260	758.5	.3712	2.147	757.9	.3649	2.044	757.2	.3588	290
300	2.295	764.5	1.3791	2.180	763.9	1.3728	2.076	763.2	1.3668	**300**
320	2.364	776.5	.3947	2.246	775.9	.3884	2.140	775.3	.3825	320
340	2.432	788.5	.4099	2.312	787.9	.4037	2.203	787.4	.3978	340
360	2.500	800.5	.4247	2.377	800.0	.4186	2.265	799.5	.4127	360
380	2.568	812.5	.4392	2.442	812.0	.4331	2.327	811.6	.4273	380
	250 *110.80°*			**260** *118.42°*			**270** *116.97°*			
Sat.	*1.202*	*633.8*	*1.1555*	*1.155*	*633.9*	*1.1518*	*1.112*	*633.9*	*1.1483*	*Sat.*
120	1.240	641.5	1.1690	1.182	639.5	1.1617	1.128	637.5	1.1544	120
130	1.278	649.6	.1827	1.220	647.8	.1757	1.166	645.9	.1689	130
140	1.316	657.2	.1956	1.257	655.6	.1889	1.202	653.9	.1823	140
150	1.352	664.6	1.2078	1.292	663.1	1.2014	1.236	661.6	1.1950	**150**
160	1.386	671.8	.2195	1.326	670.4	.2132	1.269	669.0	.2071	160
170	1.420	678.7	.2306	1.359	677.5	.2245	1.302	676.2	.2185	170
180	1.453	685.5	.2414	1.391	684.4	.2354	1.333	683.2	.2296	180
190	1.486	692.2	.2517	1.422	691.1	.2458	1.364	690.0	.2401	190
200	1.518	698.8	1.2617	1.453	697.7	1.2560	1.394	696.7	1.2504	**200**
210	1.549	705.3	.2715	1.484	704.3	.2658	1.423	703.3	.2603	210
220	1.580	711.7	.2810	1.514	710.7	.2754	1.452	709.8	.2700	220
230	1.610	718.0	.2902	1.543	717.1	.2847	1.481	716.2	.2794	230
240	1.640	724.3	.2993	1.572	723.4	.2938	1.509	722.6	.2885	240
250	1.670	730.5	1.3081	1.601	729.7	1.3027	1.537	728.9	1.2975	**250**
260	1.699	736.7	.3168	1.630	736.0	.3115	1.565	735.2	.3063	260
270	1.729	742.9	.3253	1.658	742.2	.3200	1.592	741.4	.3149	270
280	1.758	749.1	.3337	1.686	748.4	.3285	1.620	747.7	.3234	280
290	1.786	755.2	.3420	1.714	754.5	.3367	1.646	753.9	.3317	290
300	1.815	761.3	1.3501	1.741	760.7	1.3449	1.673	760.0	1.3399	**300**
320	1.872	773.5	.3659	1.796	772.9	.3608	1.726	772.3	.3559	320
340	1.928	785.7	.3814	1.850	785.2	.3763	1.778	784.6	.3714	340
360	1.983	797.9	.3964	1.904	797.4	.3914	1.830	796.9	.3866	360
380	2.038	810.1	.4111	1.957	809.6	.4062	1.881	809.1	.4014	380
400	2.093	822.3	1.4255	2.009	821.9	1.4206	1.932	821.4	1.4158	**400**

TABLE 5.—Properties of Superheated Ammonia Vapor—Continued.

[V=volume in ft.³/lb.; H=heat content in Btu./lb.; S=entropy in Btu./lb. °F.]

Temp. °F.	Absolute pressure in lbs./in.² (Saturation temperature in italics.)									Temp. °F.
	230 *105.30°*			240 *108.09°*			250 *110.80°*			
	V	*H*	*S*	*V*	*H*	*S*	*V*	*H*	*S*	
Sat.	*1.307*	*633.4*	*1.1631*	*1.263*	*633.6*	*1.1592*	*1.202*	*633.8*	*1.1555*	*Sat.*
110	1.328	637.4	1.1700	1.261	635.3	1.1621	.....	.....	.....	110
120	1.370	645.4	.1840	1.302	643.5	.1764	1.240	641.5	1.1690	120
130	1.410	653.1	.1971	1.342	651.3	.1898	1,278	649.6	.1827	130
140	1.449	660.4	.2095	1.380	658.8	.2025	1.316	657.2	.1956	140
150	1.487	667.6	1.2213	1.416	666.1	1.2145	1.352	664.6	1,2078	**150**
160	1.524	674.5	.2325	1.452	673.1	.2259	1.386	671.8	.2195	160
170	1.559	681.3	.2434	1.487	680.0	.2369	1.420	678.7	.2306	170
180	1.594	687.9	.2538	1.521	686.7	.2475	1.453	685.5	.2414	180
190	1.629	694.4	.2640	1.554	693.3	.2577	1.486	692.2	.2517	190
200	1.663	700.9	1.2738	1.587	699.8	1.2677	1.518	698.8	1.2617	**200**
210	1.696	707.2	.2834	1.619	706.2	.2773	1.549	705.3	.2715	210
220	1.729	713.5	.2927	1.651	712.6	.2867	1.580	711.7	.2810	220
230	1.762	719.8	.3018	1.683	718.9	.2959	1.610	718.0	.2902	230
240	1.794	726.0	.3107	1.714	725.1	.3049	1.640	724.3	.2993	240
250	1.826	732.1	1.3195	1.745	731.3	1.3137	1.670	730.5	1.3081	**250**
260	1.857	738.3	.3281	1.775	737.5	.3224	1.699	736.7	.3168	260
270	1.889	744.4	.3365	1.805	743.6	.3308	1.729	742.9	.3253	270
280	1.920	750.5	.3448	1.835	749.8	.3392	1.758	749.1	.3337	280
290	1.951	756.5	.3530	1.865	755.9	.3474	1.786	755.2	.3420	290
300	1.982	762.6	1.3610	1.895	762.0	1.3554	1.815	761.3	1.3501	**300**
320	2.043	774.7	.3767	1.954	774.1	.3712	1.872	773.5	.3659	320
340	2.103	786.8	.3921	2.012	786.3	.3866	1.928	785.7	.3814	340
360	2.163	798.9	.4070	2.069	798.4	.4016	1.983	797.9	.3964	360
380	2.222	811.1	.4217	2.126	810.6	.4163	2.038	810.1	.4111	380
	280 *118.45°*			290 *120.86°*			300 *123.21°*			
Sat.	*1.072*	*634.0*	*1.1449*	*1.034*	*634.0*	*1.1415*	*0.999*	*634.0*	*1.1383*	*Sat.*
120	1.078	635.4	1.1473	.....	.....	.....	.....	.....	.....	120
130	1.115	644.0	.1621	1.068	642.1	1.1554	1.023	640.1	1.1487	130
140	1.151	652.2	.1759	1.103	650.5	.1695	1.058	648.7	.1632	140
150	1.184	660.1	1.1888	1.136	658.5	1.1827	1.091	656.9	1.1767	**150**
160	1.217	667.6	.2011	1.168	666.1	.1952	1.123	664.7	.1894	160
170	1.249	674.9	.2127	1.199	673.5	.2070	1.153	672.2	.2014	170
180	1.279	681.9	.2239	1.229	680.7	.2183	1.183	679.5	.2129	180
190	1.309	688.9	.2346	1.259	687.7	.2292	1.211	686.5	.2239	190
200	1.339	695.6	1.2449	1.287	694.6	1.2396	1.239	693.5	1.2344	**200**
210	1.367	702.3	.2550	1.315	701.3	.2497	1.267	700.3	.2447	210
220	1.396	708.8	.2647	1,343	707.9	.2596	1.294	706.9	.2546	220
230	1.424	715.3	.2742	1.370	714.4	.2691	1.320	713.5	.2642	230
240	1.451	721.8	.2834	1.397	720.9	.2784	1.346	720.0	.2736	240
250	1.478	728.1	1.2924	1.423	727.3	1.2875	1.372	726.5	1.2827	**250**
260	1.505	734.4	.3013	1.449	733.7	.2964	1.397	732.9	.2917	260
270	1.532	740.7	.3099	1.475	740.0	.3051	1.422	739.2	.3004	270
280	1.558	747.0	.3184	1.501	746.3	.3137	1.447	745.5	.3090	280
290	1.584	753.2	.3268	1.526	752.5	.3221	1.472	751.8	.3175	290
300	1.610	759.4	1.3350	1.551	758.7	1.3303	1.496	758.1	1.3257	**300**
320	1.661	771.7	.3511	1.601	771.1	.3464	1.544	770.5	.3419	320
340	1.712	784.0	.3667	1.650	783.5	.3621	1.592	782.9	.3576	340
360	1.762	796.3	.3819	1.698	795.8	.3773	1.639	795.3	.3729	360
380	1.811	808.7	.3967	1.747	808.2	.3922	1.686	807.7	.3878	380
400	1.861	821.0	1.4112	1.794	820.5	1.4067	1.732	820.1	1.4024	**400**

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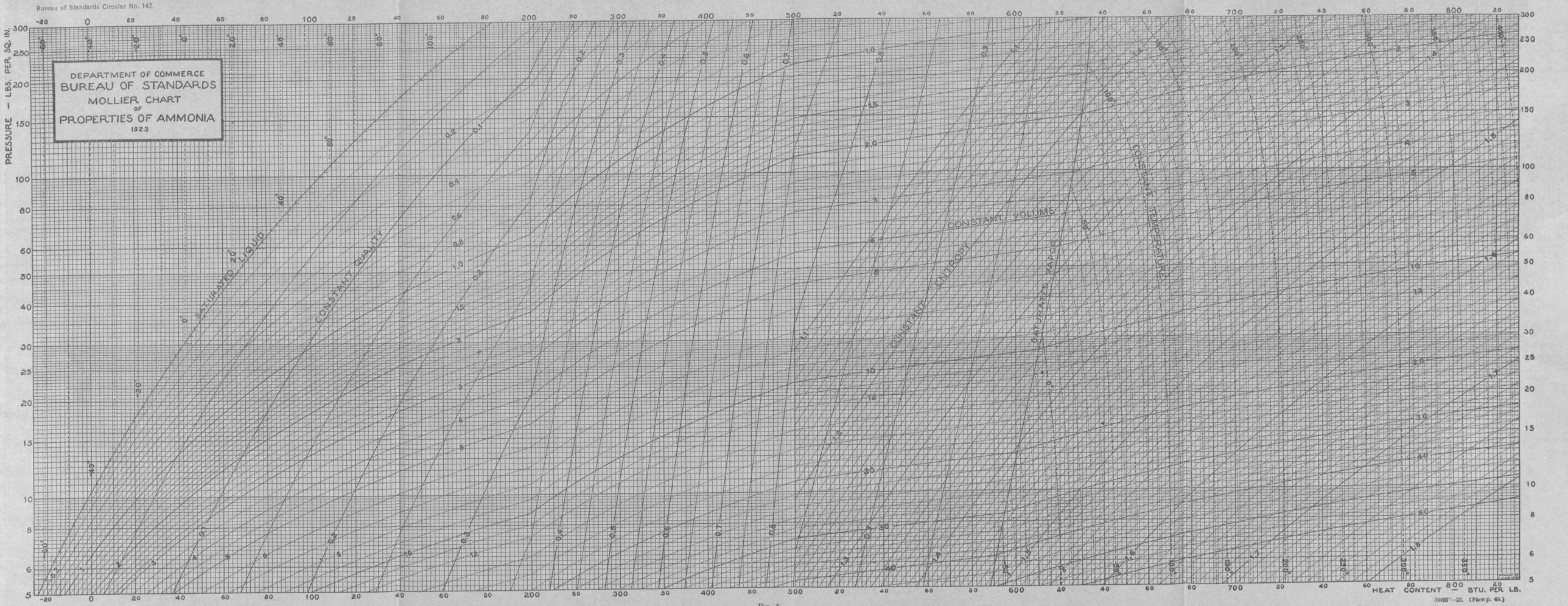

Fig. 5.

39403°—23. (Face p. 48.)

39. —23.

—23. -23. -23.