MODIFICATION OF THE KREMSER ABSORPTION EQUATION

By

RAY DEAN BECK

A THESIS

Submitted to the College of Engineering of Michigan State University of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Department of Chemical Engineering

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ABSTRACT

The purpose of this research work is to modify the Kremser equation so that it can be applied to design problems involving the absorption of rich gases. Because of the assumptions made in the development of the Kremser equation, negligible heat effects and no change in liquid-gas ratio, this method becomes inaccurate when the feed is rich in butanes, pentanes and hexanes.

Rigorous solutions for a large number of problems were obtained by means of plate-to-plate calculations, using the Michigan State Integral Computer, better known as the MISTIC. The results of these problems were used to determine a method of approach to the modification and to check the final results.

Subsequent analysis of these results indicated that the major portion of the absorption occurred on the two top and two bottom plates.

The logical approach to this modification was to experimentally determine an effective absorption factor that would account for the large variation of liquid and gas rates throughout the tower.

The correlation that proved to be successful employed a corrected liquid and gas rate to be used to calculate the effective absorption factor.

The correction factor was found to be a function of entering liquid rate, tower pressure, and percentage of absorbable components.

The modified Kremser method, using the effective absorption factor, yields reasonably accurate results for the absorption design problems investigated.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Introduction

Because of the vast quantity of gasoline refined yearly, the recovery of valuable components contained in effluent vapors from crude oil production, cracking units, and distillation units is economically important in the petroleum industry.

The high molecular weight compounds are usually separated from the low molecular weight compounds by means of absorption operations. Presently there exist numerous methods by which absorption calculations* can be made. These methods can be used for either single solute or multi-solute systems.

Review of Calculation Procedures

Many investigators have developed methods by which absorption problems can be solved. These methods range from approximate, simple calculation solutions to rigorous trial-and-error solutions. The more important methods, developed by Kremser[6], Horton and Franklin[5], Harbert[2], Edmister[4] and Sherwood[14] will be reviewed.

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* In general, absorption calculations involve calculating the number of theoretical plates necessary to absorb a given fraction of the entering components when a given absorber oil rate and pressure are employed. For more detailed calculations, the temperature and the liquid and vapor analyses on each plate are determined.

These calculations may be made by either analytical or graphical methods. In both cases a trial-and-error procedure, or a simple one-calculation procedure can be used, depending on the degree of accuracy required.

Kremser Algebraic Method[6]

The Kremser algebraic method may be used when approximate results are satisfactory or when the feed gas is lean.*

The Kremser equation is

$$\frac{A^{N+1} - A}{A^{N+1} - 1} = \frac{Y_O - Y_N}{Y_O - KX_{N+1}} \qquad (1)$$

where A is the absorption factor, i.e., $A = L/K\,G$, Y_O is the composition of feed gas, Y_N is the composition of effluent gas, X_{N+1} is the mole fraction of solute in entering absorber oil, N is the number of theoretical plates in the tower, G is the gas rate, L is the liquid rate, and K is the equilibrium constant.

With the Kremser equation one can perform two types of calculations: (1) given the tower operating conditions (temperature, pressure, feed composition) and the number of theoretical plates, one can compute the fraction absorbed for each component in the system, or (2) given the tower operating conditions and the degree of separation required for a key component, the number of theoretical plates can be calculated. With the number of theoretical plates determined, the fraction absorbed for each remaining component can be calculated.

Graphically, the Kremser method consists of drawing an equilibrium line and an operating line, and then stepping off the number of theoretical plates by drawing connecting vertical and horizontal lines between the two curves, as illustrated in Figure 1.

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* A lean gas is one which contains mainly methane and ethane with small amounts of the higher molecular weight compounds such as propane and the butanes, pentanes, and hexanes.

LIQUID -VAPOR (X-Y) EQUILIBRIUM
AND OPERATING CURVES

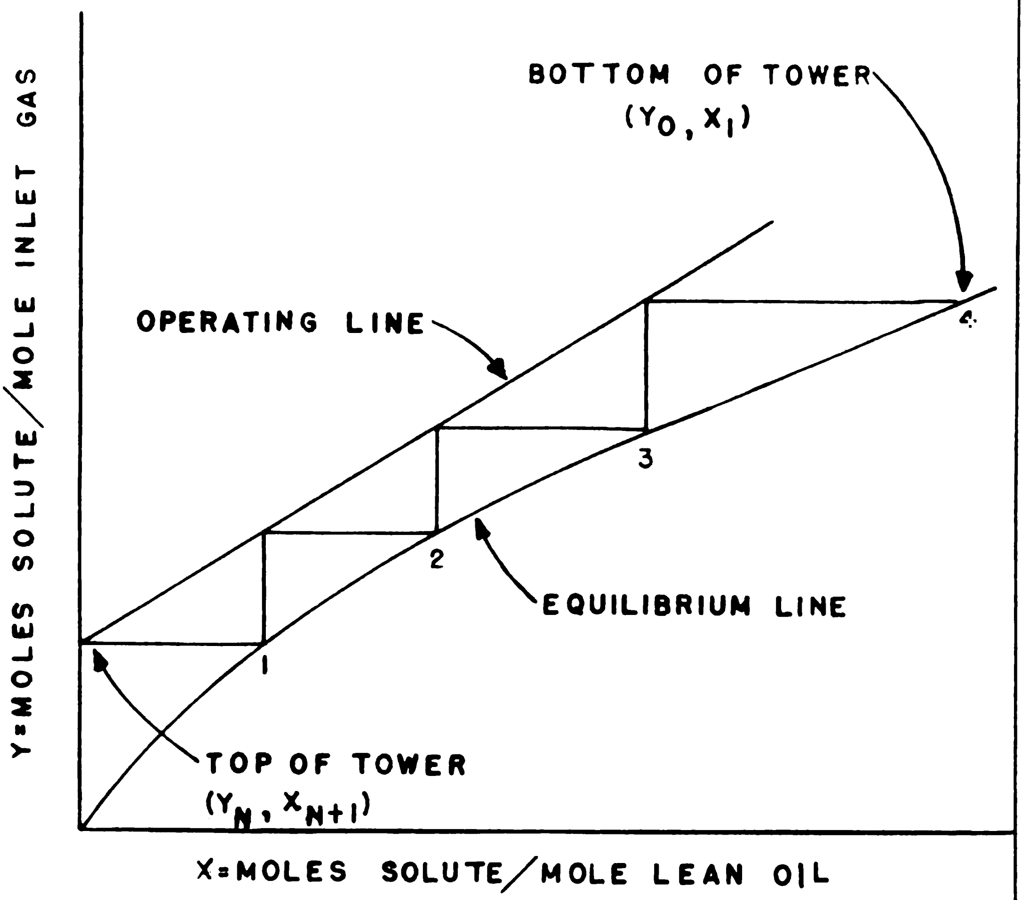


FIGURE 1

The equilibrium line is assumed to be a straight line, due to the small concentration of solutes. By assuming constant temperature and constant liquid-to-vapor ratio, the operating line is also considered to be a straight line. This method is based on two simplifying assumptions, namely: (1) the heat of condensation of the absorbed components is negligible, and (2) the rates of the liquid stream flowing down the tower and the vapor stream flowing up the tower remain constant.

By referring to Equation (1) it is seen that the Kremser correlation is a function of equilibrium constant (which is a function of temperature) and liquid-to-vapor ratio. Consequently, when the feed gas is rich, i.e., when it contains high concentrations of butanes, pentanes and hexanes, the amount of absorption is considerable and results obtained by this method deviate considerably from the true answers. The error is caused by the increased heat effects and the large variation in liquid-to-vapor ratio.

Horton and Franklin Method[5]

In 1940, Horton and Franklin presented a method for absorption calculations based on an effective absorption factor for each component in the mixture. They evaluated this effective absorption factor at several plates in the column for each component.

These effective absorption factors are substituted in the Kremser equation in place of the average absorption factor. The calculation is then the same as that described for Kremser algebraic method.

A careful examination of the absorption factor series expressions in the Harbert equation (page) indicated to Horton and Franklin that the effective absorption factor for light components corresponds to a position near the bottom of the tower, and for very heavy components, to a position near the top of the tower. In effect, this is consistent with saying that most of the absorption of the light components will take place in the top of the absorber and that the final increment of light component absorbed is controlled by the absorption factor in the bottom of the absorber.

Horton and Franklin presented the following table for determining the effective absorption factor.

TABLE I

A	(n - m)/n
0 - 0.1	1.0
0.1 - 0.4	0.9
0.4 - 1.0	0.8
1.0 - 4.0	0.7
Above 4.0	0.6

where n is the total number of plates and m is the plate on which the effective absorption factor is calculated, numbering from the bottom up. The first column consists of a range of absorption factors corresponding to a particular (n - m)/n ratio.

In addition Horton and Franklin proposed the following correlation for estimating the amount absorbed on each plate.

$$\left(\frac{G_N}{G_o}\right)^{\frac{1}{N}} = \frac{G_i}{G_{i+1}} \qquad (2)$$

where G_N is the total quantity of gas leaving the absorber, G_o is the

quantity of gas entering the absorber, and G_i is the quantity of gas leaving the ith plate.

Harbert Method[2]

Harbert's rigorous calculation methods, in general, consist of estimating the analysis of the gas leaving the top of the absorption tower, then calculating the liquid and gas analysis tray by tray downward to the bottom of the column, by a material balance around each tray. If the calculated analysis of the gas entering the bottom tray agrees with the actual analysis of the feed, the first estimate is correct. However, if these analysis do not agree, the original estimate must be adjusted, depending on the amount and direction of the deviation.

Harbert's calculations are made assuming constant temperatures which, in effect, implies the assumption of constant equilibrium values; but not constant liquid-to-vapor ratio as in the Kremser and Horton and Franklin methods.

Harbert provides supplementary calculations to account for heat effects. The temperature on each plate is calculated by means of heat and material balances and, with these temperatures, a new and more accurate material balance is calculated. This procedure is followed until two consecutive sets of temperatures, and consequently two consecutive material balances, converge to the required degree of accuracy.

A detailed Harbert procedure is now described. In tray-to-tray calculations there exists one equation for each unknown if the absorption factor, A, is considered to be constant. This can be shown algebraically by writing a material balance for one component, around each plate of the column. The unknowns are the gas compositions, for one component, on each plate, Y_1, Y_2, -- Y_N.

By rearranging the system of equations, these unknowns may be expressed as a function of feed composition, absorber liquid composition and absorption factor on each plate. The general form of these material balance equations is as follows.

$$(Gy)_n = \frac{(LX)_{N+1} \quad (A_{N-1} + A_{N-2} + \cdots A_{n+1})(1 + A_1 + A_1A_2 + \cdots + A_1A_2 \cdots A_{n-1})}{(1 + A_1 + A_1A_2 + A_1A_2A_3 + \cdots + A_1A_2A_3 \cdots A_{N-1})}$$

$$+ \frac{(Gy)_o \; (1 + A_nA_{n+1} A_{n+2} + A_{n+1}A_{n+2}A_{n+3} + \cdots + A_{n+1}A_{n+2} \cdots A_{N-1})}{(1 + A_1 + A_1A_2 + A_1A_2A_3 + \cdots + A_1A_2A_3 \cdots A_{N-1})} \qquad (3)$$

where n refers to any plate in the absorption tower and N refers to the top plate of the tower.

If the entering absorber liquid is considered to be solute-free, then the first term of the numerator drops out because $(LX)_{N+1}$ equals zero.

From Equation (3) a system of equations can be developed for each plate in the tower by substituting the proper value of n. With this system of equations it is possible to calculate the composition on each tray if the absorption factors are known. If the temperature is assumed to remain constant, then the A values will vary only with the ratio L/G.

The rate and composition of the gas and liquid leaving each tray are calculated as follows:

(a) estimate the individual absorption factors and substitute them into Equation (3), thus obtaining approximate values for the liquid and gas rates leaving each plate.

(b) using these approximate L and G values, together with the equilibrium constants, calculate new and more accurate values for the absorption factors.

(c) substitute the new absorption factors into Equation (3) to obtain a more accurate material balance.

(d) repeat steps two and three until the desired degree of accuracy is obtained.

This method yields fairly accurate results if the feed gas is lean, or if plate coolers are used to maintain constant temperature. Any appreciable difference in plate temperatures results in inaccurate calculations.

This error can be eliminated by correcting the A values for heat effects each time they are corrected for new liquid and vapor rates. The temperature correction is made by calculating individual plate temperatures from a heat balance around each plate.

The general heat balance is

$$h_{n+1}\,T_{n+1} + H_{n-1}T_{n-1} + \Delta H_n = h_n\,T_n + H_n\,T_n \qquad (4)$$

where h_n is the change in enthalpy per degree Fahrenheit for the liquid stream leaving plate n, with reference to the base temperature of the heat balance, H_n is the analogous change in enthalpy of the gas stream, and ΔH_n is the amount of heat released by condensation of the components absorbed on plate n.

The procedure now becomes:

(e) carry out steps a and b as previously outlined.

(f) obtain the plate temperatures by Equation (4).

(g) calculate new equilibrium values for each component on each plate, at the plate temperature.

(h) with the new liquid and vapor rates and the new equilibrium values, calculate new absorption factors for each component on each plate.

(i) substitute the new absorption factors into Equation (3) to obtain a more accurate material balance.

(j) repeat steps a, b and f through i until the desired degree of accuracy is obtained.

Edmister Method[4]

The Edmister method, first published in 1943, is similar to the Horton and Franklin method in that both employ an effective absorption factor. Edmister has made use of the Harbert equation to define two effective absorption factors, A_e and A' as follows

$$\frac{A_e^{N+1} - A_e}{A_e^{N+1} - 1} = \frac{A_1A_2 -- A_N + A_2A_3 -- A_N + -- + A_N}{1 + A_1A_2 -- A_N + A_2A_3 -- A_N + --- + A_N}$$

$$\frac{1}{A'}\left(\frac{A_e^{N+1} - A_e}{A_e^{N+1} - 1}\right) = \frac{A_2A_3 -- A_N + A_3A_4 -- A_N + -- A_N}{1 + A_1A_2 -- A_N + A_2A_3 -- A_N + -- + A_N}$$

By analyzing plate-to-plate calculations and test data for absorbers, Edmister determined that A_e and A' are essentially independent of the number of plates and could be expressed as a function of A_1 and A_N, the absorption factors on the top and bottom plates.

With this assumption, A_e and A' can be expressed by the following equations:

$$A_e = \sqrt{A_N (A_1 + 1) + 0.25} - 0.5 \tag{5}$$

$$A' = \frac{A_N (A_1 + 1)}{A_N + 1} \tag{6}$$

the final correlation being

$$\frac{Y_o - Y_N}{Y_o} = \left(1 - \frac{(L\ X)_{N+1}}{A'\ G_oY_o}\right)\left(\frac{A_e^{N+1} - A_e}{A_e^{N+1} - 1}\right) \tag{7}$$

If the entering absorber liquid is solute free, $(L\ X)_{N+1}$ equals zero, the first term on the right side of Equation (7) becomes unity, and the equation reduces to the Kremser type, using an effective absorption factor.

Generally, the results obtained by this method can be considered as more accurate than the Kremser method, but less accurate than the Harbert method, due to the neglect of heat effects. In cases where the feed gas is very lean, the variation between these three methods may be slight.

Sherwood Method[14]

The Sherwood method is a combination graphical and analytical method, using equilibrium and operating line concepts. The method is applied, in absorption calculations, by making preliminary calculations which permit drawing a vapor-liquid equilibrium curve for the key component.

From this X - Y diagram and the number of theoretical plates, the operating line is placed by trial and error. The concentration of the solute leaving the top of the tower is fixed by the point where the operating line intersects the ordinate. With these graphical results, the calculations for the remaining components can be completed.

Sherwood defines the key component as the component whose absorption factor is closest to unity. Butane is usually the key component in the absorption of rich gases.

The key component is usually absorbed in quantity, with its equilibrium and operating lines most nearly parallel of all the components in the system.

Sherwood employs the more accurate equilibrium relationship

$$K = \frac{Y}{X} \left(\frac{1 + X}{\Sigma Y} \right) \tag{8}$$

which takes into consideration the amount of solute carried by the absorber liquid, i.e., the change in liquid-to-gas ratio throughout the tower. Because of this variation, the equilibrium line is curved.

When the absorber liquid entering the tower contains no solute, the equilibrium curve may be located by the following two facts: (1) the slope at the origin of the graph is $K \Sigma Y_N$, where Y_N is the vapor composition leaving the top plate of the column, and (2) the point on the equilibrium curve for conditions at the bottom of the column is determined by substituting X_0, ΣX_1, and Y_0 into Equation (8), where Y_0 and X_1 are the liquid streams at the bottom of the column. This is illustrated in Figure 2.

The term ΣY_0 has unit value by definition. The value of ΣX_1 is calculated from the total moles of all components absorbed in the column. Since the exact location of the equilibrium line is determined by the total absorption, and the amount absorbed is a function of the equilibrium relations, the procedure is necessarily one of trial and error.

To start a solution by the Sherwood method, make a rough estimate of the total absorption, then calculate ΣX_1. This estimate can be made by using the Kremser equation. For the key component, construct a plot of X versus Y (see Figure 2) with slope $K \Sigma Y_N$ through the origin. Then locate the point at the bottom of the column (Y_0, X_1) from Equation (8). From this slope and point, draw the equilibrium line in its approximate position. For the first estimate, this line can be straight.

LIQUID-VAPOR (X-Y) EQUILIBRIUM

AND OPERATING CURVES

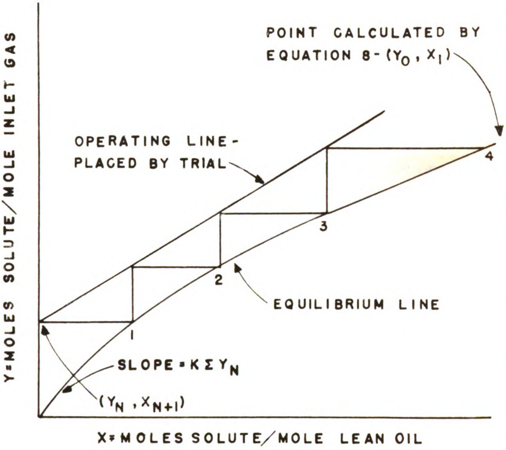


FIGURE 2

Place the operating line, with slope L/G, by trial and error. The location of this line is facilitated by the fact that the operating and equilibrium lines are nearly parallel for the key component. The operating line is placed correctly when the number of horizontal steps between the operating and equilibrium lines equals the number of theoretical plates in the absorber.

The point at which this line intersects the ordinate of the graph gives the value of Y_N. With this value a new and more accurate estimate of the total absorption can be made.

The procedure outlined above is repeated until the desired degree of accuracy is obtained.

Review of Physical Laws and Chemical Data

As in most chemical engineering operations, the unit operation of absorption has as its fundamental basis the various physical laws, such as Raoult's Law, Henry's Law and Dalton's Law.

Raoult's Law

Raoult's Law states that at any particular constant temperature, the partial pressure of one component of a liquid mixture is equal to the mole fraction of that component multiplied by its vapor pressure in the pure state at this particular temperature. According to this law the partial pressure varies linearly from zero to the full vapor pressure as the mole fraction varies from zero to unity.

Raoult's law is stated mathematically as follows:

$$P_A = P_A^{\circ} \ X_A$$

where P_A is the partial pressure of component A, P_A° is the vapor pressure of pure component A at the temperature of the system, and X_A is the mole fraction of component A in the liquid mixture.

Raoult's law applies only to mixtures in which the components are similar chemically, and in which the various components do not interact in any way.

When the concentration of the component to which Raoult's Law is applied is very high the deviation is slight. This results in the statement that Raoult's law applies to the solvent.

Henry's Law

Henry's law is somewhat anlogous to Raoult's law and states that the partial pressure of a component in a liquid mixture is proportional to the mole fraction of that component.

Henry's law is stated mathematically as follows:

$$P_A = C\ X_A$$

where C is the Henry's law constant. Strictly speaking C is constant only at a fixed temperature. By comparing the equation of Raoult's law with this equation it is obvious that Raoult's law is a special case of Henry's law wherein the constant becomes the vapor pressure of the pure component.

When the concentration of the component to which Henry's law is applied is low, the deviation becomes small, hence the statement is made that Henry's law applies to the solute.

Dalton's Law

Dalton's law simply states that the total pressure exerted by a mixture of ideal gases is equal to the sum of the pressures that would be exerted by each of the gases if it were alone and occupied the total volume of the mixture. Stated mathematically, Dalton's law is

$$P_T = P_A + P_B + P_C + \text{--} + P_N$$

where P_T is the total pressure of the system and P_A, P_B, -- P_N are the

pressure of the individual components in the system.

Dalton's law can also be stated mathematically as

$$P_A = P_T \, Y_A$$

<u>Equilibrium Relationships</u>

The various physical laws and combinations of these physical laws provide the engineer with the equilibrium relationships required for absorption calculations.

At low pressures Dalton's law can be combined with Raoult's law to give the relationship

$$P_A = P_A^{\circ} \, X_A = P_T \, Y_A, \text{ or}$$

$$\frac{Y_A}{X_A} = \frac{P_A^{\circ}}{P_T}$$

From the latter relationship the concept of the equilibrium constant is derived.

When the pressure is low and the components of the mixture are chemically similar, the equilibrium constant, K is defined by

$$K_A = \frac{Y_A}{X_A} = \frac{P_A^{\circ}}{P_T} \tag{9}$$

When the pressure is of the order of 100 to 500 pounds per square inch, the deviation from Raoult's law is appreciable when dealing with hydrocarbons, and Equation (9) can no longer be used. When equilibrium calculations are to be made at high pressures, a function termed fugacity is employed in place of P_A° and P_T.

Fugacities may be looked upon as pressures corrected for the deviations of compressibility from the ideal gas laws, at the vapor pressure and total pressure respectively. Fugacities are represented by the symbol f.

Substituting f_A° for P_A° and f_T for P_T the equilibrium relation becomes

$$K = \frac{Y_A}{X_A} = \frac{f_A^{\circ}}{f_T} \qquad (10)$$

The fugacities to be used in this relation have been determined in two ways: (1) by calculation from pressure-volume-temperature data, and (2) by direct determination of vapor-liquid equilibrium data.

Lewis and Kay[6] have correlated the results in terms of the reduced pressure of the system as the abscissa, the reduced pressure of the system as the parameter and the fugacity to pressure ratio as the ordinate.

While Equation (10) yields more accurate equilibrium values than Equation (9), neither method takes into consideration the variation due to the physical properties of the solvent or solvents. For instance, the equilibrium value for methane in propane might vary considerably from the equilibrium value for methane in hexane.

Several investigators have studied the phase equilibria of the low molecular weight hydrocarbons in various liquids in a wide range of temperatures and pressures. Foremost among these investigators are Sage, Lacey and Associates of the California Institute of Technology, who have published numerous articles concerning phase equilibria of low molecular hydrocarbons in specific solvents.[10, 11, 12, 13]

A second group of investigators, Benedict, Rubin, Webb and Friend have correlated equilibrium values as a function of the molal average boiling point of the solvent.[1] They presented their results in graphical form, the equilibrium constant and temperature as the ordinate and abscissa, with the molal average boiling point as a parameter. For one

component, each pressure would be represented by a particular graph.

As one can readily see, the method used to determine the equilibrium constants will have a pronounced effect on the accuracy of the equilibrium calculations.

In the case where the system consists of low molecular weight aliphatic hydrocarbons of a small boiling range, the use of equilibrium values calculated from fugacities should yield reasonably accurate results.

STATEMENT OF PROBLEM

Statement of Problem

The purpose of this research work was to modify the Kremser equation so it could be used for calculations involving the absorption or rich gases.

As stated previously the Kremser equation is based on two simplifying assumptions. Because of these assumptions the method is only approximate, at best, when the feed gas is rich, i.e., when it contains relatively large amounts of the butanes, pentanes and hexanes.

The method by which modification of the Kremser equation was made is: (1) solve a series of problems by means of rigorous plate to plate calculations, (2) by correlation of the results, determine a modification factor for the Kremser equation.

Because of the large and varied number of computations made in the present study, the modified Kremser equation should yield results very close to that obtained by rigorous methods. Some 504 absorption problems covering the range of temperatures, pressures, feed compositions, liquid rates, and number of theoretical plates normally encountered in industry were used for these correlations.

DERIVATION OF EQUATIONS

Derivation of Equations

Using previously outlined nomenclature, the Kremser equation and the equations by which the rigorous solutions are calculated will be derived.

Kremser Equation[6]

As stated previously, the Kremser algebraic method involves two simplifying assumptions. Heat effects are neglected, and the liquid to gas ratio is assumed constant throughout the tower.

The Kremser equation may be developed, for one component of a multicomponent system, in the following manner (see Figure 3). By a material balance around any plate, n, in an absorber, it follows that:

$$L(X_n - X_{n+1}) = G(Y_{n-1} - Y_n) \tag{11}$$

where L and G are the liquid and vapor rates respectively, X_i is the solute concentration in the liquid on the i th plate, and Y_i is the solute concentration in the vapor on the i th plate.

From the equilibrium relation $Y_n = KX_n$, where K is defined as the equilibrium constant, Y_n/K and Y_{n+1}/K may be substituted for X_n and X_{n+1} in equation (11) for a theoretical plate. This gives:

$$\frac{L}{KG}(Y_n - Y_{n+1}) = Y_{n-1} - Y_n \tag{12}$$

The factor L/KG is referred to as the absorption factor and is denoted by the symbol A, i.e., A = L/KG.

MATERIAL BALANCE DIAGRAM

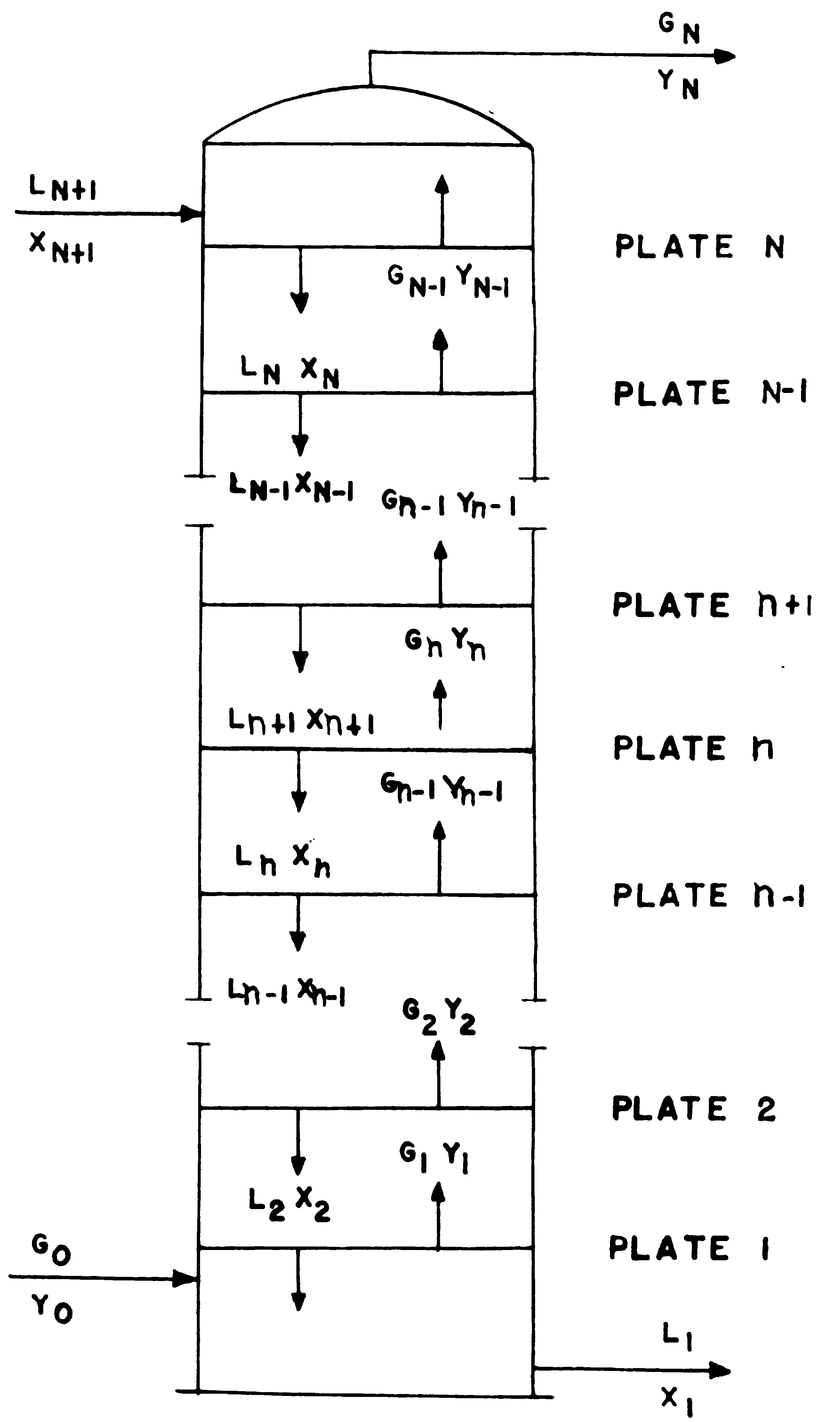


FIGURE 3

Equation (12) becomes:

$$Y_n = \frac{Y_{n-1} + A\, Y_{n+1}}{1 + A} \tag{13}$$

For the top plate N of an absorber:

$$Y_N = Y_n = \frac{Y_{n-1} + A\, KX_{N+1}}{1 + A} \tag{14}$$

where KX_{N+1} is the composition of the vapor which is considered to be in equilibrium with the liquid entering the top plate of the absorber.

For the next two plates below the top plate, respectively:

$$Y_{n-1} = \frac{Y_{n-2} + A\, Y_n}{1 + A} \tag{15}$$

$$Y_{n-2} = \frac{Y_{n-3} + A\, Y_{n-1}}{1 + A} \tag{16}$$

Combining equations (14) and (15), and eliminating Y_N:

$$Y_{n-1} = \frac{Y_{n-2}(A^2-1) + A^2\,(A-1)\, KX_{N+1}}{A^3-1} \tag{17}$$

Combining equations (16) and (17) and eliminating Y_{n-1}:

$$Y_{n-2} = \frac{Y_{n-3}\,(A^3-1) + A^3\,(A-1)\, KX_{N+1}}{A^4-1} \tag{18}$$

Equation (17) may be written:

$$Y_n = \frac{Y_{n-1}\,(A-1) + A\,(A-1)\, KX_{N+1}}{A^2-1} \tag{19}$$

By analogy with equations 17, 18, and 19, at the bottom of the tower:

$$KX_1 = Y_1 = Y_{n-(n-1)} = \frac{Y_1\,(A^n-1) + A^n\,(A-1)\, KX_{N+1}}{A^{n+1} - 1} \tag{20}$$

By a material balance around the entire column:

$$L(X_1 - X_{N+1}) = G(Y_o - Y_N) \tag{21}$$

Rearranging:

$$X_1 = \frac{G}{L}(Y_o - Y_N) + X_{N+1} \tag{21a}$$

Substituting L/KG = A:

$$KX_1 = \frac{1}{A}(Y_o - Y_N) + KX_{N+1} \tag{21b}$$

Equating equations (20) and (21b) and solving for $(Y_o - Y_N)$:

$$(Y_o - Y_N) = (Y_o - KX_{N+1}) \quad \frac{A^{n+1} - A}{A^{n+1} - 1} \quad , \text{ or}$$

$$\frac{Y_o - Y_N}{Y_o - KX_{N+1}} = \frac{A^{n+1} - A}{A^{n+1} - 1} \tag{22}$$

Equation (22) is the Kremser equation. $(Y_o - Y_N)$ is the actual change in vapor composition, and $(Y_o - KX_{N+1})$ is the maximum possible change in vapor composition.

If the concentration of the solute in the entering absorber liquid is negligible, then $KX_{N+1} = 0$, and the left side of equation (22) becomes the fraction absorbed for a particular component.

Equations for Plate to Plate Calculations

The first prerequisite of a system of equations for a rigorous solution is that they must be suitable for an iterative calculation procedure to be carried out by means of a high speed electronic computer.

Each absorption problem involves N(2M+3) equations and unknowns, where N is the number of plates in the column and M is the number of components in the system. For a thirty plate column and a eight component system, N(2M+3) equals 570 equations and unknowns. Since these equations are non-linear, a matrix cannot be used to solve the system; even if they were linear, the number of equations greatly exceeds the capacity of the computer. Therefore the process must be

iterative, requiring only tower operating data.

When the tower operating conditions, such as pressure, maximum allowable tower temperature, feed composition, number of plates, and temperature of the entering streams are specified, no further engineering judgment is required, regardless of the number of trial and error calculations or cooler plates required.

Material Balance[3]

Using the same nomenclature as before, the material balance may be developed as follows (see Figure 3):

By definition:

$$K_n = Y_n/X_n \text{ and } A_n = L_n/K_n\, G_n,$$

there $$L_n\, x_n = \frac{L_n}{G_n}\; G_n\; \frac{y_n}{K_n} = A_n\, Y_n \qquad (23)$$

Equation 23 states that the amount of a component in the liquid on the nth plate is equal to A_nY_n.

From a material balance around the nth plate for one component:

$$Y_{n-1} + L_{n+1}\, x_{n+1} = Y_n + L_n x_n$$

Since $L_i\, x_i = A_i Y_i$:

$$Y_{n-1} + A_{n+1}Y_{n+1} = Y_n + A_nY_n \qquad (24)$$

From a material balance around the bottom of the column for one component:

$$Y_o + L_n x_n = L_1 x_1 + Y_{n-1} \quad \text{or}$$

$$Y_o + A_n Y_n = A_1 Y_1 + Y_{n-1} \qquad (25)$$

From a material balance around the top of the column for one component:

$$Y_{n-1} + L_{N+1}\, x_{N+1} = L_n\, x_n + Y_N \;, \text{ or}$$

$$Y_{n-1} + A_{N+1}\, Y_{N+1} = A_n\, Y_n + Y_N \qquad (26)$$

It is necessary to use all three equations (24, 25 and 26) in the absorber tray calculations at various times even though they are equivalent equations. This is necessary in the interest of accuracy, i.e., when very small concentrations of a given component are used to calculate a much larger concentration on another plate, large cumulative errors are involved. This condition is eliminated by switching to another equation. A simple rule will be given later stating just when to use each equation.

Each of the above sets of material balances forms a system of N equations containing N unknowns if the compositions of the input streams are known.

The system of equations derived from the material balance around the n'th plate (Equation 24) is as follows:

$$Y_0 + A_2Y_2 - Y_1\ (1+A_1) = 0$$

$$Y_1 + A_3Y_3 - Y_2\ (1+A_2) = 0$$

$$Y_2 + A_4Y_4 - Y_3\ (1+A_3) = 0$$

- - - - - - - - - - - - -

$$Y_{N-1} + A_{N+1}Y_{N+1} - Y_N\ (1+A_N) = 0$$

By dividing the first equation by $(1+A_1)$ and adding the second, Y_1 is eliminated and the resulting equations are:

$$\frac{Y_0}{(1+A_1)} + A_3Y_3 - Y_2 \quad \left(1+A\ ) - \frac{A_2}{(1+A_1)}\right) = 0, \text{ and} \qquad (27)$$

$$Y_2 + A_4Y_4 - Y_3\ (1+A_3) = 0$$

Similarly, Y_2 may be eliminated by dividing equation (27) by $\left(1 + A_2 - \frac{A_2}{1+A_1}\right)$ and adding the third equation. If a sequence of numbers are defined as follows:

$$b_1 = 1 + A_1$$

$$b_2 = 1 + A_2 - \frac{A_2}{b_1}$$

- - - - - - - - - -

$$b_N = 1 + A_N - \frac{A_N}{b_{N-1}}$$

then elimination of Y_1, Y_2, ---, Y_N results in the following equations:

$$\frac{Y_o}{b_1 b_2 b_3 --- b_{N-1}} + A_{N+1}Y_{N+1} - Y_N b_N = 0 \text{ , or}$$

$$Y_N = \frac{Y_o}{b_1 b_2 b_3 --- b_N} + \frac{A_{N+1}Y_{N+1}}{b_N} \tag{28}$$

For the case where $A_{N+1}Y_{N+1} = 0$, (the entering liquid is solute free), Equation (28) becomes:

$$Y_N = \frac{Y_o}{b_1 b_2 b_3 --- b_N} \tag{29}$$

This equation will be used to calculate the composition of the effluent vapor.

After Y_N has been determined, the Y_n's can be found by a sequence of calculations using the system of equations derived from a material balance around each plate. However, the calculations are simpler if the equation from a material balance around the top or bottom of the absorber is used.

The system of equations derived from a material balance, around the bottom of the column (Equation 25) are:

$$Y_o - Y_1 A_1 + A_2 Y_2 - Y_1 = 0$$

$$Y_o - Y_1 A_1 + A_3 Y_3 - Y_2 = 0$$

$$Y_o - Y_1 A_1 + A_4 Y_4 - Y_3 = 0$$

- - - - - - - - - - - - - -

$$Y_o - Y_1 A_1 + A_{N+1} Y_{N+1} - Y_N = 0$$

When $A_{N+1}Y_{N+1} = 0$, $Y_N = Y_o - Y_1A_1$, then the equations may be written as follows:

$$Y_1 = \frac{Y_o - Y_N}{A_1} \qquad \text{(Set A)}$$

$$Y_2 = \frac{Y_1 - Y_N}{A_2}$$

$$Y_3 = \frac{Y_2 - Y_N}{A_3}$$

- - - - - - - - -

$$Y_{N-1} = \frac{Y_{N-2} - Y_N}{A_{N-1}}$$, or for any plate, n:

$$Y_n = \frac{Y_{n-1} - Y_N}{A_n}$$

For components for which the A's are small and Y_o is only slightly larger than Y_N this system of equations is not practical and the equation derived from a material balance around the top of the column is preferable.

The system of equations derived from a material balance around the top of the column (Equation 26) are:

$$Y_{N-1} = Y_N - A_{N+1}Y_{N+1} + A_NY_N$$

$$Y_{N-2} = Y_N - A_{N+1}Y_{N+1} + A_{N-1}Y_{N-1}$$

$$Y_{N-3} = Y_N - A_{N+1}Y_{N+1} + A_{N-2}Y_{N-2}$$

- - - - - - - - - - - - - - - -

$$Y_1 = Y_N - A_{N+1}Y_{N+1} + A_2Y_2$$

When $A_{N+1}Y_{N+1} = 0$, these equations becomes

$$Y_{N-1} = Y_N + A_NY_N \qquad \text{(Set B)}$$

$$Y_{N-2} = Y_N + A_{N-1}Y_{N-1}$$

$$Y_{N-3} = Y_N + A_{N-2}Y_{N-2}$$

- - - - - - - - - - - -

$$Y_1 = Y_N + A_2Y_2$$

Or for any plate n

$$Y_n = Y_N + A_{n+1}Y_{n+1}$$

For components for which Y_N is very small Equation Set B is not practical and Equation Set A will be used.

Heat Balance

With reference to a datum temperature T°, a heat balance will be formed around the n'th plate. From this heat balance the temperature on the (n+1)'th plate will be calculated. First the terms enthalpy and heat of condensation will be defined.

Enthalpy is a relative function, and is defined as the total heat content of a system, with reference to a particular datum temperature. The enthalpy at the datum temperature is defined to be zero.

The heat of condensation of a substance at a particular temperature is equal to the difference in the enthalpies of vapor and liquid at this temperature.

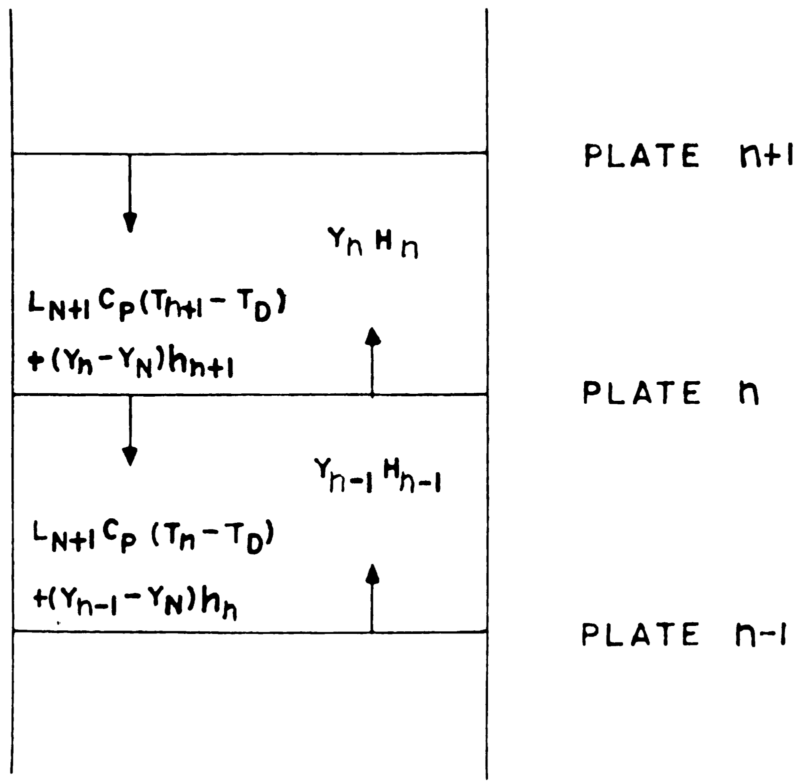
Symbolically, the enthalpy of the vapor will be denoted as H_n, the enthalpy of the liquid as h_n, and the heat of vaporization as ΔH_n, where the subscript n means that these functions are evaluated at the temperature on the n'th plate.

The heat entering the n'th plate is given by the following equation (see Figure 4):

$$(T_{n+1} - T^{\circ})\, LC_{PL} + (Y_n - Y_N)\, h_{n+1} + Y_{n-1}H_{n-1} + (Y_{n-1} - Y_n)\, \Delta H_n$$

The first term denotes heat content of the absorber liquid stream, the second term denotes heat content of the absorbed components from the (n+1)'th plate, the third term denotes heat content of the vapor stream from the (n-1)'th plate, and the fourth term denotes heat entering due to condensation of vapors on the n'th plate.

HEAT BALANCE DIAGRAM



HEAT ENTERING PLATE n DUE TO CONDENSATION $= (Y_{n-1} - Y_n) \Delta H_n$

FIGURE 4

Heat leaving the n'th plate is given by:

$$(T_n - T^*)LC_{PL} + (Y_{n-1} - Y_N)\, h_n + Y_n H_n$$

where the three terms denote heat content of the streams leaving the n'th plate.

Under steady state conditions heat entering the n'th plate must be equal to heat leaving. Hence the above two equations can be equated giving:

$$(T_{n+1} - T^*)\, LC_{PL} + (Y_n - Y_N)\, h_{n+1} + Y_{n-1}H_{n-1} + (Y_{n-1} - Y_n)\, \Delta H_n$$
$$= (T_n - T^*)LC_{PL} + (Y_{n-1} - Y_n)\, h_n + Y_n H_n \qquad (30)$$

By rearranging, Equation (30) becomes:

$$T_{n+1} = T^* + \left((T_n - T^*)LC_{PL} + Y_{n-1}h_n - Y_N h_n + Y_n H_n - Y_n h_{n+1} \right.$$
$$\left. + Y_N h_{n+1} - Y_{n-1}H_{n-1} - Y_{n-1}\Delta H_n + Y_n \Delta H_n \right) / LC_{PL}$$

Collecting the Y_i terms:

$$T_{n+1} = T^* + \left((T_n - T^*)LC_{PL} + Y_{n-1}(h_n - H_{n-1} - \Delta H_n) \right.$$
$$\left. + Y_n(H_n - h_{n+1} + \Delta H_n) + Y_N(h_{n+1} - h_n) \right) / LC_{PL}$$

Since $\Delta H = H - h$

$$T_{n+1} = T^* + \left((T_n - T^*)LC_{PL} + Y_{n-1}(2h_n - h_{n-1} - H_n) \right.$$
$$\left. + Y_n(2H_n - h_{n+1} - h_n) + Y_N\,(h_{n+1} - h_n) \right) / LC_{PL} \qquad (31)$$

This heat balance is used to calculate the temperature on each plate as follows: The temperature on the bottom plate is specified by the maximum allowable tower temperature. The temperature on the rest of the plates from the second to the (N+1)'th plate, are calculated by the following system of equations, written by analogy with Equation (31):

$$T_2 = T^* + \left((T_1 - T^*)LC_{PL} + Y_o(2h_1 - H_o - H_1) \right. \qquad \text{(Set C)}$$
$$\left. + Y_1(2H_1 - h_2 - h_1) + Y_N(h_2 - h_1) \right) / LC_{PL}$$

- -

$$T_{N+1} = T^{\circ} + \big((T_N - T_o)LC_{PL} + Y_{N-1}(2h_N - H_{n-1} - H_n)$$
$$+ Y_N\,(2H_N - h_{N+1} - h_N) + Y_N(h_{N+1} - h_N) \big) \,/LC_{PL}$$

The calculated temperature T_{N+1} must equal the actual temperature of the liquid stream entering the top plate of the column.

If after the first trial these temperatures do not agree, the assumed temperature, T_1, must be adjusted and calculations repeated. A detailed outline of calculation procedure is given in the next section.

DETAILED OUTLINE OF CALCULATION PROCEDURE

Detailed Outline of Calculation Procedure

The following section indicates the tower operating conditions required and the step by step calculation procedure employed in solving absorption problems by the Kremser method and by the trial and error method.

Kremser Method

To solve the absorption problems by the Kremser method the following tower operating conditions have been assumed:

(1) tower operating temperature,

(2) tower operating pressure,

(3) composition and rate of feed gas,

(4) absorber liquid rate, and

(5) number of theoretical plates.

In addition to the above information, the equilibrium values for each component at the tower operating temperature and pressure are required.

As a matter of convenience equilibrium values are correlated, for each component as a function of temperature and at a particular pressure, by a third degree polynomial.

The calculation procedure is as follows:

(a) calculate equilibrium values for each component at the tower operating temperature and pressure by: $K = a + bT + cT^2 + dT^3$. Constants a, b, c, and d vary with the tower pressure.

(b) with the assumed entering vapor and liquid rates, calculate the liquid to vapor ratio, L/G for the column.

(c) calculate the absorption factor, $A = L/KG$ for each component in the system.

(d) given the number of theoretical plates (N), calculate A^{N+1} for each component in the system.

(e) by means of Equation (22)

$$\frac{A^{N+1} - A}{A^{N+1} - 1} = \text{FRACTION ABSORBED}$$

calculate the fraction absorbed (F) for each component.

(f) with the fraction absorbed, the analysis of the effluent vapor can be calculated in the following manner $Y_N = (1 - F)Y_O$.

Plate to Plate Calculations

To solve the absorption problem by rigorous plate to plate calculations requires, in addition to the specifications stated for the Kremser method, the following information:

(1) maximum allowable tower temperature; this is specified for each problem.

(2) heat capacity of absorber liquid; this is a function of the liquid used.

(3) enthalpy values for each component, both liquid and vapor, at the tower pressure and plate temperature. The enthalpy values are calculated in the same manner as the equilibrium values, i.e., they are calculated at a particular pressure as a function of temperature, by means of a third degree polynomial.

The plate to plate calculations are then carried out in the following manner:

(a) as a first estimate it is assumed that the temperature on each plate is equal to the temperature of the entering streams, $T_n = T_0 = T_{N+1}$ for all n. It is also assumed that the liquid to vapor ratio on each plate is equal to the ratio of the entering streams, L_{N+1}/G_0.

(b) calculate K values for each component on each plate at the plate temperature.

(c) calculate absorption factors, $A = L/KG$ for each component on each plate.

(d) calculate b values for each component, i.e., $b_1 = A_1 + 1$, $b_2 = 1 + A_2 - \frac{A_2}{b_1}$, ---, $b_n = 1 + A_n - \frac{A_n}{b_{n-1}}$

(e) calculate the composition of the vapor leaving the top plate, Y_N by means of Equation (29), $Y_N = Y_0/b_1b_2b_3 \text{ --- } b_N$.

(f) calculate the composition of the vapor on each plate by means of:

(a) Equation Set A if the absorption factor is greater than one.

(b) Equation Set B if the absorption factor is equal to or less than one.

(g) calculate the vapor rate on each plate, i.e., $G = \sum Y_i$, where the subscript i, refers to the number of components.

(h) calculate the liquid rate on each plate, i.e., $L_n = L_{n+1} + G_{n-1} - G_n$.

(i) calculate a new liquid to vapor ratio, L/G for each plate from steps (g) and (h).

(j) compare the new values of L/G with the values assumed in step (a).

If these values do not agree repeat the calculation procedure starting at step (b) using the new L/G values as the estimate. This procedure is repeated until two consecutive iterations yield results that agree within limits. When this occurs, plate temperatures are calculated, based on the final material balance.

(k) assume that the temperature on the first plate, T_1 is the maximum allowable tower temperature.

(l) calculate enthalpies for liquid and vapor at the temperatures T_0, T_1, and T_2. These temperatures are from the previous iteration, or for the first iteration, the initially assumed temperatures.

(m) calculate the temperature on the second plate and on each succeeding plate, by means of Equation Set C.

(n) when the temperature on any plate reaches the maximum allowable tower temperature, a cooler plate is required, and the calculations are continued from this point.

(o) the last temperature calculated, T_{N+1} must equal the actual temperature of the entering liquid stream. If this does not occur, the temperature of the last cooler plate must be increased or decreased, depending on whether the temperature, T_{N+1} is below or above the actual liquid temperature.

(p) compare this set of temperatures with the temperatures of the last iteration. If they do not agree within limits, the complete procedure must be repeated, starting at step (b), using the last calculated temperatures and liquid to vapor ratios as the estimate.

(q) when the temperatures of two consecutive iterations converge, the iterative process is complete and the material and heat balances are correct.

High Speed Electronic Computers

In the past few years the electronic computer has developed from a research tool to a practical industrial tool. Because of the high speed computer long trial and error problems, once impractical as design methods, have now become feasible.

Obviously, to attempt to calculate 504 absorption problems by hand would be impossible, since the average problem would require approximately 100 hours of computation to reach a solution. Hence the only practical method of attempting the solution of such a large number of problems was by means of a high speed computer.

Computer Operation[8]

Basically a computer can perform seven operations; addition, subtraction, multiplication, division, and determine whether one number is greater than, equal to, or less than another number.

The computer used for this research work was the Michigan State Integral Computer, better known as the MISTIC.

The language of the MISTIC is the binary number system. The use of this number system is essential for both speed and economy. By analogy with the decimal number system, which has as its base the number ten, the binary number system has as its base the number two. By this system any number can be represented by a combination of the digits zero and one. Obviously, the use of the binary number system reduces the complexity of the computer and greatly increases operation speed. The MISTIC like most computers, consists of five sections:

input, memory or storage, arithmetic, control, and output.

Input:

The input section of the MISTIC is an electro-magnetic reader for translating information presented to it into the language of electrical impulses accepted by the computer. At present, information can be fed to the MISTIC by either perforated tape or punched cards.

The tape reader operates on the following principle: a bright light is allowed to shine above the tape; if there is a hole in the tape the light shines through to a light sensitive surface. The configuration of spots of light corresponding to the holes in one line across the tape is then translated into electrical pulses which are equivalent to the number represented by the character.

Storage or Memory

Storage or memory is that part of the computer which holds information for a period of time, to be used by other parts of the computer. The MISTIC memory is composed of 40 cathode ray tubes, similar in appearance to television picture tubes. On the face of each tube is a square grid of 1024 points. Each point represents one digit (or binary bit) of a number in each memory position. Hence, the computer is capable of holding 1024 binary numbers, each 40 digits long. Forty binary digits correspond to about twelve decimal digits.

The numbers stored in memory may possess several meanings, roughly categorized as numbers that represent number and numbers that represent non-numerical information such as orders. An outline of coding procedure is given in the next section.

Arithmetic

The arithmetic section of the computer is that part in which addition, substraction, multiplication, division, and certain logical operations are performed. Essentially this section consists of the accumulator register and the quotient register. Addition, subtraction, and division take place in the accumulator with the result being left in the accumulator for addition and subtraction, and in the quotient register for division. Multiplication takes place in the quotient register, with the results being left in the accumulator.

Control

The entire computer must be given explicit instructions as to how to perform, and the control section is that part of the computer which must accept, interpret, and execute these directions. The directions that the control section executes are called orders, and a collection of orders (called a program) is stored in the memory. No special place in memory is reserved for orders, so the only distinction made between orders and data is relative position, known to the programmer. However, when control knows where the first of a set of orders is located, control will acquire and execute each order from successive locations.

Output

When the control section has executed a number of orders which caused, for example, input, storage, and the execution of orders, it may be desired to send some of the information out of the computer. The section which translates from the machine language of electrical pulses representing binary digits to some mechanical medium is called the output section. This output can be printed on paper, or the

characters can be punched on paper tape, which in turn can be printed at a later time. The punch has by far the fastest rate, operating at sixty characters per second, while the printer operates at ten characters per second.

Coding Procedure

The procedure for coding a problem for MISTIC can best be illustrated by discussing the program actually used for the absorption problems. First, however, the basic orders will be given.

FIXED POINT ORDERS

ORDER	OPERATION
L5 n	Transfer contents of location n to A (Accumulator register)
50 n	Transfer contents of location n to Q (Quotient register)
L4 n	Add contents of n to A
L0 n	Subtract contents of n from A
75 n	Multiply Q by contents of n
66 n	Divide A by contents of n
40 n	Transfer contents of A to n
S5	Transfer contents of Q to A
22 n	Transfer control to right order location n
26 n	Transfer control to left order location n
32 n	If contents of A $\geq$ 0, transfer control to right order location n
36 n	If contents of A $\geq$ 0, transfer control to left order location n

Of course these are but a few of the orders in the MISTIC repertoire; however, they are the most frequently used orders.

Since the MISTIC is a fractional computer, all numbers put in as data and all results must be greater than minus one but less than plus one. Obviously, this presents a difficult scaling problem both in data input and in arithmetic. To avoid this scaling problem a standard library routine called "floating point" (designated A-1) is used. With this routine, scaling is automatically taken care of and data can be put in as a decimal number and a power of ten exponent.

When employing A-1 a different type or order system is used, called floating point programming. A floating accumulator is used in place of the A and Q registers, and is specified by location three. Below is a list of the most commonly used floating point orders.

<u>FLOATING POINT ORDERS</u>

ORDER	OPERATION
80 n	Substract contents of n from contents of F (floating register)
81 n	Transfer the negative of n to F
82 n	Transfer control to the right hand order in n if $F \geq 0$
83 n	Transfer control to the left hand order in n if $F \geq 0$
84 n	Add n to F
85 n	Transfer n to F
86 n	Divide F by n
87 n	Multiply F by n
88 n	Read in one word from data tape
89 n	Print one word from memory

8K n	Replace F by n if 0 - n 200 (integer)
8S n	Transfer F to n
8N n	Subtract absolute value of n from the absolute value of F
8J n	Transfer control to fixed point order - left side
8F n	Set up to print a block of numbers having n columns

If the first function digit of a floating point order is 0, 1, --, 7 it refers to one of a set of control registers or b-registers in the floating decimal routine which are similarly numbered. These numbers are used for counting the number of passages through loops or cycles and for increasing addresses on successive passages. For this purpose a particular b- register which may be used in a particular cycle contains two counting indices g_b and c_b. These are both integers in the range 0 to 1023. The index c_b is used for counting purposes to determine the number of passages through a loop. The index g_b is used for advancing addresses of floating arithmetic orders. Although the address is not actually altered in memory, the order is obeyed as if g_b is added to its address. The index g_b is advanced by one upon each passage through the cycle or loop. The mulitiplicity of b- registers allows one to program many loops within loops.

The orders used for looping are the same as previously given with the 8 replaced by b = 0, 1, --, 7. For example, the addition order would be b 4 n. The order for setting up a loop would be b K n, which instructs the computer to repeat a set of orders n times.

Duration of Floating Point Orders

8N 80 84	5 milliseconds
81 85	2 milliseconds
82 83	3 milliseconds
87	5 milliseconds
86	6 milliseconds
8K	3 milliseconds
8S	3 milliseconds
8F	3 milliseconds
8L	2 milliseconds
8J	3 milliseconds

When $b \neq 8$ add one millisecond to the above times.

Absorption Program

As stated previously, the equilibrium constants and enthalpy values are calculated by means of third degree polynomials. Since the nested form is employed for these polynomials, the constants a, b, c, and d must be placed in reverse order: d, c, b, and a. These constants determine the tower operating pressure.

The number of plates in the tower is determined by three numbers, called parameters. These will be discussed when the program is presented.

Below is an outline of the program and answer storage, followed by the program.

PROGRAM OUTLINE

Location	Contents
3	Specifies Floating Accumulator
4	Specifies A-1 Routine
5	Specifies K Routine
6	Specifies h Routine
7	Plate Parameters
8	Plate Parameters
9	Plate Parameters
10-26	Temporary Storage
27-28	Floating Accumulator
29-196	A-1 Routine
197-238	K Routine
239-312	h Routine
317-476	Program
546-1002	Results
1003-1023	Data

ANSWER STORAGE

Location	Contents
546-576	Liquid Rate
577-606	Vapor Rate
607-638	Temperature - Present Iteration
639-669	Temperature - Previous Iteration
670-699	Liquid to Vapor Ratio
700-747	Enthalpy Values
748-754	Counters

PROGRAM

00 3K	Directive - specific location of following orders
00F 0027 F	Specifies location of floating accumulator
00F 0029 F	Specifies location of A-1 routine
00F 00 197 F	Specifies location of K subroutine
00F 00 239 F	Specifies location of h subroutine
00F 00 XF	Orders 7, 8 and 9 parameters which
00F 00 YF	determine the number of plates*
00F 00 ZF	
00 313 K	Directive
22 L	Standard entry to A-1 routine
50 L	
26 84	
0K 21 F	Set to read 21 words of data
88 F	
98 1003F	
03 2L	
0K 488	
85 1014F	
08 670F	
85 1013F	
08 607F	
03 4L	

---

* The parameters are as follows:

X = 484 + number of plates

Y = Number of plates minus two

Z = 514 ± (8) number of plates

for a twenty plate column:

X = 504
Y = 18
Z = 674

00 320K	Directive
8S 749F	
0K 8F	Store constants for calculation of b's and b_N
8K 1F	
0S 850F	
8S 1018F	
0S 800F	
03 1L	
0K 2S8	Calculate K, A, b
2K 8F	
0S 603F	
8S 10F	
8J 6L	Transfer control to K routine
22 6L	
50 6L	
26 S5	
05 670F	Calculate L/KG = A
26 11F	
8S 841F	
26 800F	
8S 840F	
8K 1F	
84 841F	
80 840F	Calculate $b_i = A_i + 1 - \frac{A_i}{b_{i-1}}$
2S 800F	
27 850F	
2S 850F	
22 7L	
03 4L	
0K 8F	Calculate Y_{N_i}
0S 755F	
06 850F	
0S 241S9	
02 14L	
0K 1S8	Calculate Y_{n_i} by Equation Set A
1K F	
2K 8F	
0S 123S7	
8S 10F	
8J 20L	
22 20L	
50 20L	
26 S5	
05 185S7	
26 18F	
17 248S9	
24 248S9	
1S 240S9	
1L 1023F	
2L 1022F	
22 21L	
0L 1022F	

03 18L	
0K 1S8	Calculate Y_{n_1} by Equation Set B
1K F	
2K 8F	
0S 608F	
8S 10F	
8J 30L	
8J 30L	
22 30L	
50 30L	
26 S5	
05 670F	
26 11F	
8S 754F	
8K 1F	Check to see if A 1 to determine
80 754F	which Y_{n_1} will be used
82 36L	
15 755F	
20 241S9	
86 754F	
1S 763F	
1L 1F	
22 31L	
02 27L	
8K F	
8S 748F	
8S 1016F	Calculate I_n and G_n
8S 62S7	
0K 8F	
8K F	
04 248S9	
0L 1022F	
03 41L	
8S 92S7	
0K 2S8	
1K F	
2K 8F	
8K F	
14 240S9	
1L 1023F	
23 45L	
0S 91S7	
00 92S7	
04 62S7	
0S 61S7	
06 92S7	
8S 754F	
00 185S7	Compare L/G with last iteration
8N 1020F	
82 52L	
8K 1F	
84 748F	
8S 748F	

```
85 754F
03 10587
0L 1022F
03 44L
85 1022F
80 742F
82 L          If L/G do not converge, repeat
85 1012F          iteration
8S 639F       If L/G converge, proceed to temperature
8K F              calculations
8S 750F
83 751F
83 752F
83 753F
0K 203
4K F
5K F
1K 3F
2K F
3K 16F
45 607F
8S 10F
8J 64L        Transfer control to h routine
22 64L
50 64L
26 86
35 11F
23 700F
2L 1F
32 65L
4L 1F
13 62L
2K 8F         Calculate temperature on each plate
25 724F           by Equation Set C
24 724F
20 700F
20 716F
57 755F
84 750F
83 750F
23 716F
24 716F
20 740F
20 724F
57 763F
84 750F
83 750F
23 740F
20 724F
27 24139
84 750F
83 750F
5L 1F
23 69L
```

```
85 750F
86 1017F
04 639F
03 640F
8J 82L
F5 752F
40 752F
L0 148L
36 90L
41 750F
50 84L
26 84
05 640F
80 1013F
82 89L
88 1012F
08 640F
8K F
88 751F
82 92L
8J 90L
F5 751F
40 751F
41 750F
50 91L
26 84
4L 1022F
03 61L
8J 94L
L5 751F
42 100L
L5 148L
L0 751F
42 752F
00 20F
46 101L
46 102L
80 3F
46 103L
41 751F
50 99L
26 84
0K F
0L F
4K F
4L F
5K F
5L F
85 1013F
80 15587
83 754F
8N 754F
82 103L
```

Check whether T_n is maximum allowable tower temperature

Check whether T_{N+1} equals actual liquid temperature, if not adjust, if it does proceed to temperature convergence check

05 639F	
84 754F	
9S 639F	
83 61L	
0K 3S8	
05 639F	
00 603F	
8N 1021F	
82 112L	
8K 1F	
84 753F	
8S 753F	
8K 2F	
8S 10F	
05 639F	
04 608F	
86 10F	
0S 608F	
03 109L	
85 753F	
80 1023F	
82 119L	
8K 1F	
84 749F	
8S 749F	
82 L	If T's do not converge, repeat iteration.
8F 4F	If T's converge, print results.
0K 3S8	
05 607F	
89 8F	Print: temperature - each plate
05 576F	
89 8F	liquid rates - each plate
05 546F	
89 8F	vapor rates - each plate
05 670F	
89 8F	L/G - each plate
02 120L	
85 124S7	
89 8F	
8F 4F	Print $\frac{Y_0 - Y_N}{Y_0} = F$
0K 8F	
05 755F	
00 241S9	
06 755F	
89 8F	
03 127L	
8F 4F	
0K 3S8	
1K F	
2K 8F	
15 755F	
89 8F	Print vapor analysis (each component)
1L 1F	for each plate

```
22 131L
03 131L
85 749F                          Print number of iterations required
89 3F                                 for convergence
8J 136L
8J 136
0F F                             Stop computer
0F F

00 29K                           Directive
A-1 Routine

00 197K                          Directive

K5 F                             K Routine
42 9L
22 1L
50 1L
26 S4
6K 8F
7K F
65 10L
87 10F
64 11L
87 10F
64 12L
87 10F
64 13L
7S 11F
6L 1F
6L 3F
62 3L
8K 1F
82 F

00 10K

22L
50L
26 S4
0K 32F
88 F
08 10S5
03 2L
8J 4L
26 999F
26 999F
26 10N
4 constants for each component
```

<u>00 239K</u>

```
K5 F
42 9L
22 1L
50 1L
26 S4
6K 10F
7K F
65 10L
87 10F
64 11L
87 10F
64 12L
87 10F
64 11L
87 10F
64 13L
7S 11F
7L 1F
6L 3F
62 3L
8K 1F
82 F
```

<u>00 10K</u>

```
22 L
50 L
26 S4
0K 64F
83 F
0S 10S6
03 2L
8J 4L
26 999N
26 999N
26 10N
```

8 constants for each component

24 313N — Directive tells the computer to stop reading and execute the order in location 313

The data format is as follows:

Y_0 - component a

Y_0 - component b

Y_0 - component c

Y_0 - component d

Y_0 - component e

Y_0 - component f

Y_0 - component g

Y_0 - component h

T_{N+1} = entering liquid temperature

T_n = maximum allowable tower temperature

T_0 = entering gas temperature

L_{N+1}/G_0

G_0

L_{N+1}

$L_{N+1}C_{PL}$ - total heat capacity of absorber liquid

+1 +40 - constant

+1 +01 - constant

+5 -02 - constant

+25 +00 - constant

Number of Plates - 0.9

Number of Plates + 0.1

For example, a twenty plate column operating at 100°F, with a maximum 10°F rise, a liquid rate of 20 moles per hour, a gas rate of 100 moles per hour, and a heat capacity of 94 BTU/mol.-°F, the data would be as follows:

+	78 5	+ 02
+	75	+ 01
+	55	+ 01
+	17	+ 01
+	34	+ 01
+	135	+ 01
+	145	+ 01
+	6	+ 00
+	1	+ 03
+	11	+ 03

+	1	+	03
+	2	+	00
+	1	+	03
+	2	+	02
+	183	+	04
+	1	+	40
+	1	+	01
+	5	-	02
+	25	+	00
+	191	+	02
+	201	+	02

DISCUSSION OF DATA

Discussion of Data

The results of the 504 absorption problems are given in the Appendix. The range of the problems is as follows:

PRESSURES: 14.7 PSIA, 50 PSIA, 100 PSIA, and 500 PSIA.

TEMPERATURES: 75°F, 90°F, 100°F, and 110°F.

THEORETICAL PLATES: 5, 10, and 20.

LIQUID - GAS RATIOS: 0.1, 0.2, 0.5, 0.8, 1.0, 1.5, and 2.0.

FEED COMPOSITIONS: listed as A, B, C, D, E, and F (analyses given in Table 2).

TABLE 2

Feed Compositions

Comp.	Analysis - Mole Percent					
	A	B	C	D	E	F
CH_4	60.00	65.00	70.00	78.50	85.00	95.00
C_2H_6	13.90	12.10	10.36	7.50	5.14	1.47
C_3H_8	10.21	8.94	7.76	5.50	3.76	1.01
i-C_4H_{10}	3.16	2.87	2.37	1.70	1.36	1.05
n-C_4H_{10}	6.33	5.53	4.74	3.40	2.32	0.75
i-C_5H_{12}	2.54	2.21	1.89	1.35	0.93	0.28
n-C_5H_{12}	2.73	2.37	2.04	1.45	0.98	0.31
n-C_6H_{14}	1.13	0.98	0.84	0.60	0.51	0.13

Problems were solved using all possible combinations of variables except temperature. The system used was as follows: at a particular liquid to vapor ratio, problems were solved for all six feeds at 75°F and 14.7 PSIA, 90°F and 50 PSIA, 100°F and 100 PSIA, and 110°F and 500 PSIA. These problems were repeated for each liquid to vapor ratio,

then all of the above problems were repeated for each number of theoretical plates, thus giving results over a wide range for all variables.

For each problem the following data was obtained: analysis for each component on each plate, temperature, liquid rate and gas rate on each plate, and number and location of coolers.

Since space prevents this great amount of data being listed in this thesis, only the effluent gas analysis is shown in the Appendix. The complete data are filed in the Chemical Engineering Computer Library, Michigan State University.

CORRELATION OF RESULTS

Correlation of Results

Analysis of results given in the Appendix shows that approximately 80 percent of all absorption occurs on the two top and two bottom plates.

Most of the absorption of the less volatile components (butanes, pentanes, hexanes) takes place on the bottom two plates, while most of the absorption of the more volatile components (methane, ethane, propane) takes place on the top two plates. This is logical since the vapor at the top of the absorber contacts fresh, unsaturated liquid, while the vapor entering the bottom of the column contacts a liquid which has just absorbed the less volatile components thus increasing its absorbing capacity.

From this analysis it appeared that a correlation might be made relating the amount of absorption on the top two plates to the amount of absorption on the bottom two plates. If this could be done the Kremser equation could be applied to the middle section of the column. Several attempts in this direction, however, failed to yield the desired results.

Therefore it was decided to attempt to find an effective absorption factor which would allow one to use the Kremser equation and still obtain accurate results.

Since the amount of absorption is a function of the liquid to gas ratio, temperature, pressure and the percentage of absorbable components (less volatile components), and effective absorption factor should be a function of these variables.

Such an effective absorption factor was found and it did prove to be a function of the four variables given above.

The effective absorption factor, A_e, has the following form:

$$A_e = \frac{L_{N+1} + c \sum Y_A}{K_T (G_0 - c \sum Y_A)}$$

where $\sum Y_A$ is the sum of the percentages of the less volatile components (butanes, pentanes, hexane) in the feed, hereafter defined as the percent absorbables, and K_T is the equilibrium constant evaluated at the maximum tower temperature. The correction factor c is a function of the liquid to gas ratio, the pressure and the percent absorbables.

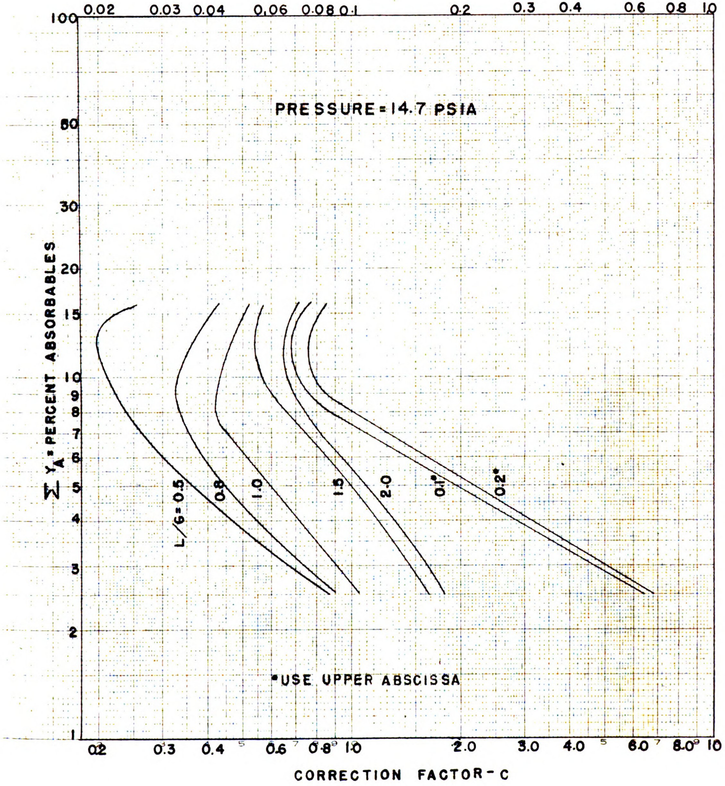
For the problems presented the percent absorbables is the sum of the percentages of the butanes, pentanes, and hexanes in the feed gas. This function will be directly related to the feed and type of absorption. As a case in point consider the absorption of ethylene from a feed of methane, ethane, ethylene, and propane; very likely the percent absorbables would be the percent of ethylene in the feed. For cases where the liquid rate and pressure are high, propane should also be considered an absorbable component.

The correction factor c was determined by trial and error, using the computer. Various values of c were tried and the answers obtained by the modified Kremser method were compared with the answers obtained by plate to plate calculations. It became apparent that c followed a definite pattern, and was a function of the pressure liquid - gas ratio, and percent absorbables, but was not a function of temperature or the number of theoretical plates in the absorber.

Figures 5-8 are plots of correction factor c versus the percent absorbables, $\sum Y_A$ with liquid to gas ratio as parameter. Each graph represents a particular pressure.

The parameters pressure and liquid to gas ratio were combined so as to permit all correction factors to be represented on one graph. Figure 9 is a plot of percent absorbables versus correction factor with the product liquid to gas ratio times pressure, in atmospheres, as parameter.

The effective absorption factor, once determined can be substituted directly into the Kremser equation.



0.02 0.03 0.04 0.06 0.08 0.1 0.2 0.3 0.4 0.6 0.8 1.0
PRESSURE = 14.7 PSIA
$\sum Y_A$ = PERCENT ABSORBABLES
100
50
30
20
15
10
9
8
7
6
5
4
3
2
1
L/G = 0.5
0.8
1.0
1.5
2.0
0.1*
0.2*
*USE UPPER ABSCISSA
0.2 0.3 0.4 0.6 0.8 1.0 2.0 3.0 4.0 6.0 8.0 10
CORRECTION FACTOR - C

FIGURE 5

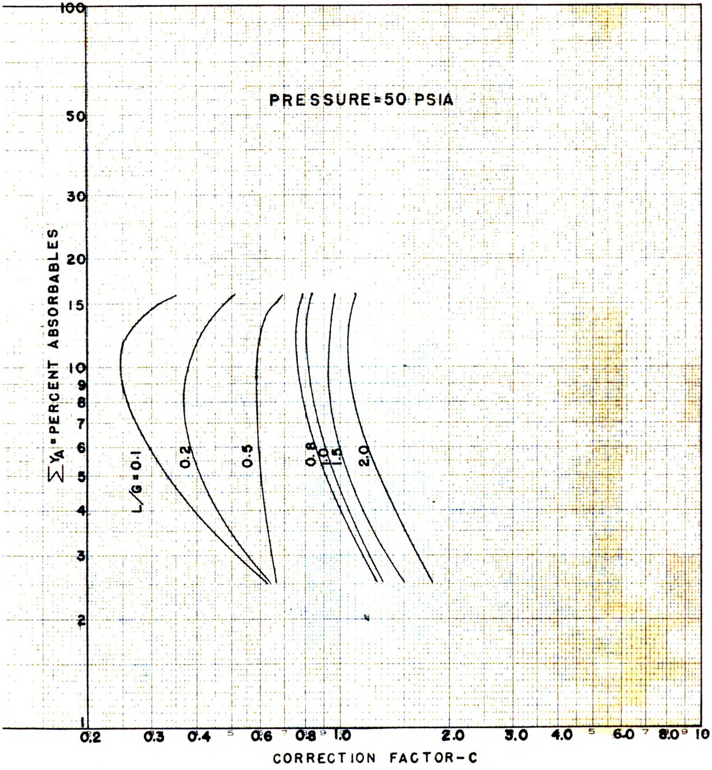

PRESSURE=50 PSIA
ΣYA = PERCENT ABSORBABLES
100
50
30
20
15
10
9
8
7
6
5
4
3
2
1
L/G = 0.1
0.2
0.5
0.8
1.0
1.5
2.0
0.2
0.3
0.4
0.6
0.8
1.0
2.0
3.0
4.0
6.0
8.0
10
CORRECTION FACTOR-C

FIGURE 6

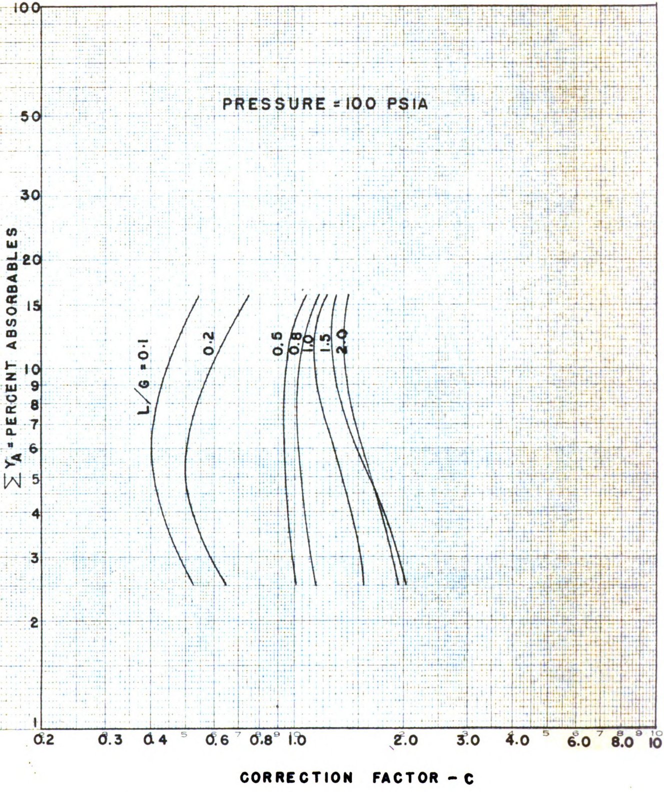

PRESSURE = 100 PSIA
$\sum Y_A$ = PERCENT ABSORBABLES
L/G = 0.1
0.2
0.5
0.8
1.0
1.5
2.0
100
50
30
20
15
10
9
8
7
6
5
4
3
2
1
0.2
0.3
0.4
0.6
0.8
1.0
2.0
3.0
4.0
6.0
8.0
10
CORRECTION FACTOR – C

FIGURE 7

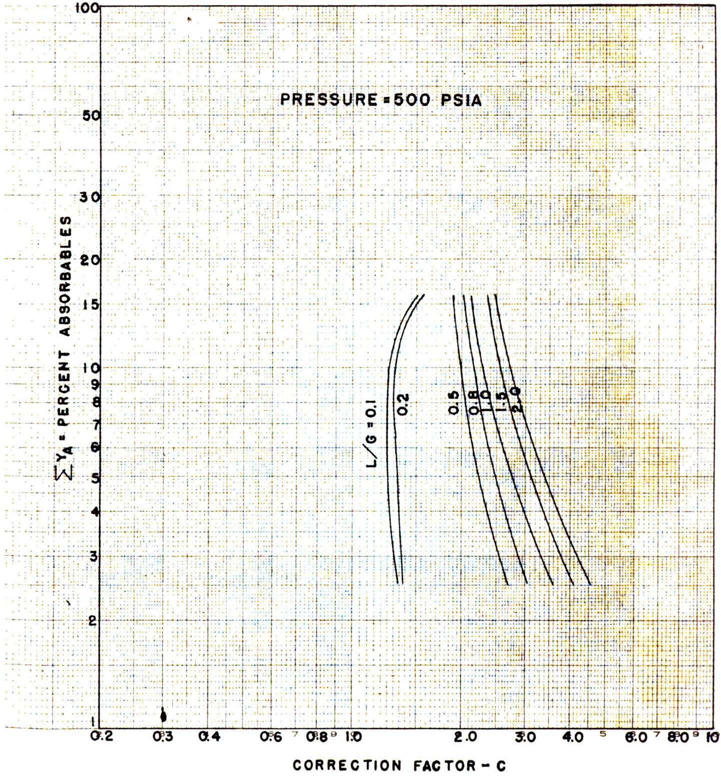
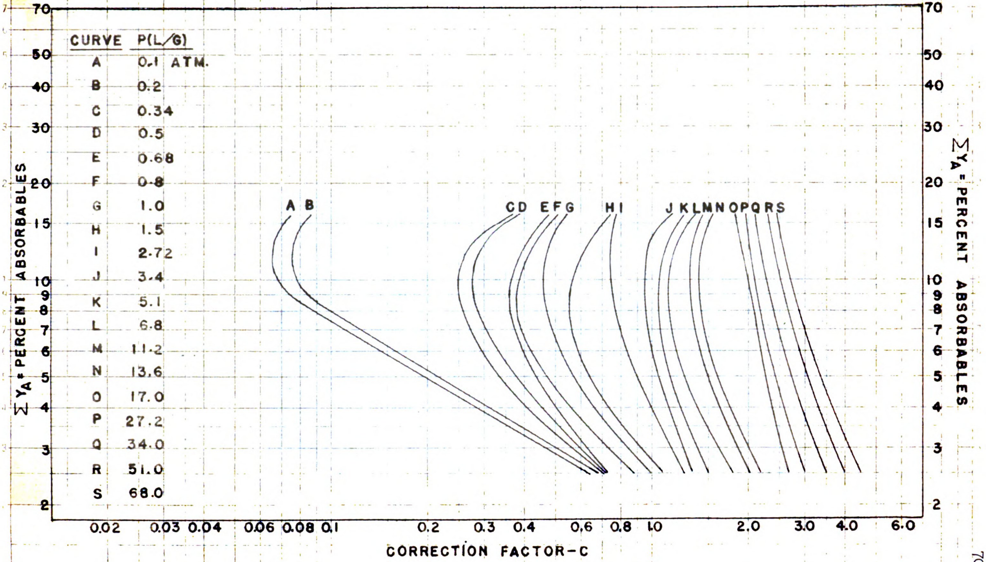

PRESSURE = 500 PSIA
$\sum Y_A$ = PERCENT ABSORBABLES
CORRECTION FACTOR – C
L/G = 0.1
0.2
0.5
0.8
1.0
1.5
2.0
100
50
30
20
15
10
9
8
7
6
5
4
3
2
1
0.2
0.3
0.4
0.6
0.8
1.0
2.0
3.0
4.0
6.0
8.0
10

FIGURE 8



CURVE P(L/G)
A 0.1 ATM.
B 0.2
C 0.34
D 0.5
E 0.68
F 0.8
G 1.0
H 1.5
I 2.72
J 3.4
K 5.1
L 6.8
M 11.2
N 13.6
O 17.0
P 27.2
Q 34.0
R 51.0
S 68.0
A B
C D E F G H I J K L M N O P Q R S
$\sum Y_A$ = PERCENT ABSORBABLES
0.02 0.03 0.04 0.06 0.08 0.1 0.2 0.3 0.4 0.6 0.8 1.0 2.0 3.0 4.0 6.0
CORRECTION FACTOR-C

FIGURE 9

CONCLUSIONS

Conclusions

Comparison of the results obtained by the three methods, plate to plate calculations, Kremser method, and the modified Kremser method, showed that the modified Kremser method gave better results than the Kremser method in 90 percent of the cases. The studies in which the Kremser method gave a better result than the modified Kremser occurred where conditions approached the assumptions on which the Kremser equation is based: low liquid rate, lean feed gas, and low pressure. In all of these cases, both methods gave good results.

The maximum error in the modified Kremser method, with respect to total moles absorbed, was 19.8 percent.

However, the problem which gave maximum deviation, and other problems which show a high deviation, were those in which the total absorption was small, i.e., low liquid rate, low pressure, lean feed. In most of these cases the component analysis were frequently accurate to the second decimal place.

In some cases the individual analyses were inaccurate at the first or second decimal place, however, the percent deviation was often smaller than 0.5 percent with respect to total absorption. The cases where this condition occurred were at high pressures and liquid rates, where the total absorption is high.

In the middle range, where the pressures and liquid rates are close to those normally encountered, the modified Kremser method yields very good results. In this area the deviation ranges from a minimum of 0.025 percent to approximately 6.0 percent.

NOMENCLATURE

Nomenclature

L = liquid rate, mole/hr.

G = gas rate, mole/hr.

x = mole fraction of a component in liquid.

y = mole fraction of a component in gas.

K = equilibrium constant, y/x.

K_T = equilibrium constant evaluated at the maximum tower temperature.

f = fugacity.

A = absorption factor, L/KG.

A_e = effective absorption factor, $(L_{N+1} + c\ Y_A/G_o - c\sum Y_A)/K$.

Y = amount of a component in gas (Gy), mole/hr.

X = amount of a component in liquid (Lx), mole/hr.

T = temperature, °F.

T_D = datum temperature, °F.

C_p = heat capacity of absorber liquid, BTU/mole/°F.

h = enthalpy of liquid, BTU/mole.

H = enthalpy of gas, BTU/mole.

ΔH = heat of condensation, BTU/mole.

$\sum Y_A$ = percent absorbables (sum of percentages of less volatile components, usually highest boiling half) in the feed gas.

c = correction factor for effective absorption factor, function of pressure, liquid-gas ratio and percent absorbables.

F = fraction absorbed.

Subscripts

1, 2, 3, --, N = plate number in absorber, counting from bottom up (N = top plate in absorber).

o denotes streams entering bottom of tower.

N+1 denotes streams entering top of tower.

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APPENDIX

TABLE III

COMPOSITION OF EFFLUENT GAS (Y_N): 20-PLATE COLUMN

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F.											
1	0.1	A	P	59.9713	13.8505	10.0875	3.0511	6.0279	2.2391	2.3116	0.7381
			K	59.9755	13.8552	10.0966	3.0597	6.0487	2.2518	2.3344	0.7533
			M	59.9718	13.8523	10.0932	3.0561	6.0418	2.2531	2.3302	0.7481
2	0.1	B	P	64.9696	12.0575	8.8342	2.7724	5.2696	1.9513	2.0109	0.6435
			K	64.9735	12.0609	8.8407	2.7788	5.2842	1.9644	2.0265	0.6533
			M	64.9705	12.0599	8.8416	2.7792	5.2876	1.9696	2.0359	0.6611
3	0.1	C	P	69.9679	10.3242	7.6693	2.2904	4.5196	1.6712	1.7342	0.5541
			K	69.9712	10.3266	7.6738	2.2947	4.5293	1.6799	1.7444	0.5599
			M	69.9689	10.3265	7.6764	2.2966	4.5367	1.6889	1.7586	0.5726
4	0.1	D	P	78.4651	7.4747	5.4371	1.6442	3.2452	1.1967	1.2365	0.3989
			K	78.4679	7.4758	5.4389	1.6460	3.2489	1.1999	1.2399	0.3999
			M	78.4657	7.4761	5.4417	1.6482	3.2565	1.2086	1.2531	0.4119
5	0.1	E	P	84.9631	5.1229	3.7177	1.3160	2.2159	0.8258	0.8375	0.3409
			K	84.9653	5.1234	3.7182	1.3168	2.2169	0.8266	0.8379	0.3399
			M	84.9615	5.1230	3.7186	1.3170	2.2184	0.8289	0.8419	0.3442
6	0.1	F	P	94.9603	1.4652	0.9988	1.0165	0.7167	0.2489	0.2652	0.0869
			K	94.9612	1.4652	0.9988	1.0166	0.7166	0.2489	0.2651	0.0866
			M	94.9544	1.4648	0.9982	1.0148	0.7152	0.2477	0.2637	0.0852

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
7	0.2	A	P	59.9444	13.8103	9.9973	2.9734	5.8099	2.0421	2.0406	0.4989
			K	59.9510	13.8103	9.9831	2.9594	5.7673	1.9755	1.9387	0.3767
			M	59.9465	13.8097	9.9891	2.9635	5.7848	1.9973	1.9737	0.4075
8	0.2	B	P	64.9406	12.0223	8.7534	2.6997	5.0742	1.7721	1.7648	0.4243
			K	64.9469	12.0219	8.7413	2.6878	5.0384	1.7188	1.6831	0.3267
			M	64.9434	12.0232	8.7509	2.6956	5.0645	1.7485	1.7283	0.3676
9	0.2	C	P	69.9369	10.2938	7.5978	2.2288	4.3482	1.5119	1.5139	0.3573
			K	69.9429	10.2932	7.5876	2.2195	4.3187	1.4699	1.4487	0.2800
			M	69.9399	10.2951	7.5981	2.2279	4.3464	1.5006	1.4951	0.3222
10	0.2	D	P	78.4310	7.4524	5.3844	1.5976	3.1165	1.0743	1.0678	0.2448
			K	78.4359	7.4516	5.3778	1.5921	3.0978	1.0499	1.0297	0.2000
			M	78.4333	7.4535	5.3865	1.5992	3.1207	1.0749	1.0668	0.2341
11	0.2	E	P	84.9266	5.1074	3.6804	1.2774	2.1250	0.7369	0.7172	0.2012
			K	84.9306	5.1086	3.6744	1.2737	2.1138	0.7233	0.6959	0.1700
			M	84.9264	5.1075	3.6809	1.2778	2.1257	0.7368	0.7159	0.1929
12	0.2	F	P	94.9207	1.4606	0.9879	0.9842	0.6847	0.2191	0.2224	0.0461
			K	94.9224	1.4605	0.9876	0.9833	0.6833	0.2178	0.2201	0.0433
			M	94.9148	1.4604	0.9879	0.9843	0.6849	0.2198	0.2235	0.0463

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
13	0.5	A	P	59.8639	13.6876	9.7106	2.7349	5.1352	1.4207	1.1736	0.0003
			K	59.8776	13.6758	9.6428	2.6584	4.9233	1.1288	0.7527	0.0001
			M	59.8686	13.6780	9.6671	2.6771	4.9902	1.2062	0.8716	0.0001
14	0.5	B	P	64.8541	11.9147	8.5045	2.4768	4.4702	1.2098	0.9819	0.0004
			K	64.8673	11.9048	8.4433	2.4147	4.3011	0.9821	0.6534	0.0001
			M	64.8578	11.9069	8.4651	2.4318	4.3606	1.0505	0.7581	0.0001
15	0.5	C	P	69.8496	10.2009	7.4773	2.0393	3.8176	1.0108	0.8111	0.0000
			K	69.8571	10.1929	7.3288	1.9938	3.6867	0.8399	0.5625	0.0000
			M	69.8475	10.1954	7.3494	2.0096	3.7416	0.9024	0.6581	0.0000
16	0.5	D	P	78.3290	7.3840	5.2214	1.4541	2.7175	0.6388	0.5297	0.0000
			K	78.3398	7.3790	5.1944	1.4302	2.6444	0.5999	0.3998	0.0000
			M	78.3259	7.3787	5.2038	1.4369	2.6712	0.6321	0.4504	0.0000
17	0.5	E	P	84.8176	5.0599	3.5655	1.1581	1.8430	0.4571	0.3331	0.0000
			K	84.8265	5.0571	3.5511	1.1441	1.8044	0.4133	0.2702	0.0000
			M	84.8178	5.0596	3.5642	1.1565	1.8391	0.4518	0.3267	0.0000
18	0.5	F	P	94.8070	1.4466	0.9552	0.8862	0.5875	0.1231	0.0913	0.0000
			K	94.8061	1.4463	0.9539	0.8833	0.5833	0.1244	0.0855	0.0000
			M	94.7944	1.4468	0.5969	0.8914	0.5931	0.1347	0.1014	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
19	0.8	A	P	59.7767	13.5225	9.2853	2.3330	4.0249	0.2794	0.0245	0.0000
			K	59.8041	13.5413	9.3024	2.3575	4.0793	0.3080	0.0204	0.0000
			M	59.7753	13.5203	9.2814	2.3341	4.0383	0.2889	0.0191	0.0000
20	0.8	B	P	64.7622	11.7770	8.1447	2.1336	3.5584	0.2322	0.0159	0.0000
			K	64.7878	11.7877	8.1453	2.1412	3.5638	0.2680	0.0177	0.0000
			M	64.7607	11.7751	8.1408	2.1327	3.5621	0.2793	0.0213	0.0000
21	0.8	C	P	69.7482	10.0882	7.0817	1.7732	3.0836	0.2073	0.0108	0.0000
			K	69.7714	10.0926	7.0702	1.7681	3.0547	0.2292	0.0153	0.0000
			M	69.7451	10.0848	7.0736	1.7675	3.0710	0.2538	0.0213	0.0000
22	0.8	D	P	78.2271	7.3142	5.0527	1.3043	2.3013	0.2668	0.0362	0.0000
			K	78.2437	7.3065	5.0111	1.2683	2.1911	0.1637	0.0108	0.0000
			M	78.2299	7.3118	5.0405	1.2918	2.2693	0.2404	0.0324	0.0000
23	0.8	E	P	84.7087	5.0114	3.4468	1.0342	1.5497	0.1549	0.0153	0.0000
			K	84.7225	5.0074	3.4258	1.0146	1.4951	0.1729	0.0073	0.0000
			M	84.7067	5.0106	3.4490	1.0325	1.5461	0.1635	0.0211	0.0000
24	0.8	F	P	94.6834	1.4324	0.9219	0.7869	0.4887	0.0366	0.0228	0.0000
			K	94.6898	1.4321	0.9202	0.7834	0.4833	0.0339	0.0023	0.0000
			M	94.6756	1.4334	0.9262	0.7998	0.5024	0.0515	0.0076	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
25	1.0	A	P	59.7220	13.4298	9.0559	2.1223	3.4317	0.0341	0.0006	0.0000
			K	59.7551	13.4516	9.0755	2.1569	3.5167	0.0346	0.0005	0.0000
			M	59.7197	13.4264	9.0517	2.1297	3.4713	0.0310	0.0005	0.0000
26	1.0	B	P	64.7038	11.6976	7.9473	1.9455	3.0428	0.0252	0.0004	0.0000
			K	64.7347	11.7097	7.9467	1.9589	3.0722	0.0301	0.0004	0.0000
			M	64.7007	11.6935	7.9401	1.9475	3.0679	0.0327	0.0005	0.0000
27	1.0	C	P	69.6862	10.0211	6.9130	1.6211	2.6515	0.0155	0.0002	0.0000
			K	69.7143	10.0258	6.8978	1.6177	2.6333	0.0258	0.0004	0.0000
			M	69.6836	10.0185	6.9083	1.6224	2.6689	0.0358	0.0006	0.0000
28	1.0	D	P	78.1589	7.2662	4.9343	1.1971	2.0015	0.0313	0.0005	0.0000
			K	78.1796	7.2581	4.8889	1.1604	1.8889	0.0184	0.0003	0.0000
			M	78.1645	7.2662	4.9292	1.1930	1.9953	0.0497	0.0012	0.0000
29	1.0	E	P	84.6360	4.9783	3.3643	0.9471	1.3419	0.0168	0.0003	0.0000
			K	84.6531	4.9742	3.3422	0.9283	1.2889	0.0127	0.0002	0.0000
			M	84.6295	4.9766	3.3620	0.9463	1.3424	0.0274	0.0005	0.0000
30	1.0	F	P	94.6043	1.4229	0.8995	0.7199	0.4217	0.0040	0.0001	0.0000
			K	94.6122	1.4226	0.8918	0.7167	0.4167	0.0038	0.0001	0.0000
			M	94.5943	1.4242	0.9052	0.7370	0.4403	0.0104	0.0003	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
31	1.5	A	P	59.5856	13.1987	8.4837	1.5911	1.8834	0.0000	0.0000	0.0000
			K	59.6327	13.2274	8.5083	1.6553	2.1104	0.0000	0.0000	0.0000
			M	59.5774	13.1858	8.4634	1.6064	2.0200	0.0000	0.0000	0.0000
32	1.5	B	P	64.5581	11.4996	7.4557	1.4758	1.7447	0.0000	0.0000	0.0000
			K	64.6020	11.5145	7.4500	1.5034	1.8437	0.0000	0.0000	0.0000
			M	64.5503	11.4893	7.4378	1.4840	1.8314	0.0000	0.0000	0.0000
33	1.5	C	P	69.5334	9.8661	6.5304	1.2857	1.6971	0.0000	0.0000	0.0000
			K	69.5714	9.8587	6.4667	1.2415	1.5803	0.0000	0.0000	0.0000
			M	69.5382	9.8614	6.5166	1.2786	1.7167	0.0000	0.0000	0.0000
34	1.5	D	P	77.9875	7.1413	4.6198	0.9097	1.1907	0.0000	0.0000	0.0000
			K	78.0194	7.1371	4.5833	0.8905	1.1336	0.0000	0.0000	0.0000
			M	77.9730	7.1327	4.6032	0.9034	1.1932	0.0000	0.0000	0.0000
35	1.5	E	P	84.4538	4.8931	3.1497	0.7203	0.7768	0.0000	0.0000	0.0000
			K	84.4796	4.8913	3.1333	0.7124	0.7735	0.0000	0.0000	0.0000
			M	84.4304	4.8897	3.1480	0.7239	0.8169	0.0000	0.0000	0.0000
36	1.5	F	P	94.4067	1.3990	0.8429	0.5508	0.2523	0.0000	0.0000	0.0000
			K	94.4184	1.3989	0.8417	0.5500	0.2501	0.0000	0.0000	0.0000
			M	94.3808	1.4001	0.8501	0.5723	0.2774	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
37	2.0	A	P	59.4489	12.9669	7.9069	1.0400	0.4397	0.0000	0.0000	0.0000
			K	59.5102	13.0030	7.9411	1.1539	0.7681	0.0000	0.0000	0.0000
			M	59.4227	12.9244	7.8242	1.0381	0.5656	0.0000	0.0000	0.0000
38	2.0	B	P	64.1209	11.3003	6.9577	0.9897	0.4742	0.0000	0.0000	0.0000
			K	64.4694	11.3194	6.9533	1.0480	0.6710	0.0000	0.0000	0.0000
			M	64.3931	11.2759	6.9127	0.9997	0.6090	0.0000	0.0000	0.0000
39	2.0	C	P	69.3760	9.6848	6.0647	0.8482	0.4923	0.0000	0.0000	0.0000
			K	69.4286	9.6916	6.0355	0.8654	0.5752	0.0000	0.0000	0.0000
			M	69.3601	9.6692	6.0373	0.8580	0.5955	0.0000	0.0000	0.0000
40	2.0	D	P	77.8172	7.0199	4.3174	0.6325	0.4274	0.0000	0.0000	0.0000
			K	77.8592	7.0161	4.2718	0.6207	0.4126	0.0000	0.0000	0.0000
			M	77.8020	7.0135	4.3122	0.6449	0.4979	0.0000	0.0000	0.0000
41	2.0	E	P	84.2722	4.8098	2.9419	0.4996	0.2836	0.0000	0.0000	0.0000
			K	84.3061	4.8084	2.9244	0.4966	0.2815	0.0000	0.0000	0.0000
			M	84.2424	4.8058	2.9461	0.5140	0.3356	0.0000	0.0000	0.0000
42	2.0	F	P	94.2092	1.3752	0.7869	0.3830	0.0912	0.0000	0.0000	0.0000
			K	94.2245	1.3752	0.7856	0.3834	0.1224	0.0000	0.0000	0.0000
			M	94.1735	1.3677	0.7966	0.4124	0.0910	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.											
43	0.1	A	P	59.8856	13.7369	9.7894	2.8405	5.3735	1.5739	1.4732	0.1348
			K	59.9239	13.7839	9.9072	2.9230	5.6131	1.7732	1.7314	0.2437
			M	59.8965	13.7525	9.8289	2.8693	5.4565	1.6411	1.5529	0.1095
44	0.1	B	P	64.8908	11.9801	8.6335	2.6371	4.8712	1.5755	1.5530	0.3349
			K	64.9175	11.989	8.6748	2.6547	4.9037	1.5428	1.5030	0.2113
			M	64.8931	11.9775	8.6218	2.6181	4.8022	1.4640	1.3954	0.1284
45	0.1	C	P	69.8863	10.2597	7.4988	2.1792	4.1769	1.3438	1.3310	0.2791
			K	69.9111	10.2735	7.5298	2.1983	4.2032	1.3194	1.2938	0.1811
			M	69.8915	10.2612	7.4996	2.1740	4.1520	1.2887	1.2493	0.1481
46	0.1	D	P	78.3799	7.4301	5.3205	1.5649	2.9977	0.9542	0.9376	0.1871
			K	78.4004	7.4374	5.3369	1.5725	3.0149	0.9424	0.9196	0.1294
			M	78.3851	7.4324	5.3258	1.5673	3.0018	0.9445	0.9194	0.1323
47	0.1	E	P	84.8758	5.0935	3.6403	1.2534	2.0479	0.6559	0.6314	0.1524
			K	84.8921	5.0971	3.6485	1.2580	2.0573	0.6492	0.6215	0.1099
			M	84.8689	5.0923	3.6346	1.2488	2.0339	0.6359	0.6324	0.0923
48	0.1	F	P	94.8722	1.4572	0.9789	0.9687	0.6625	0.1947	0.1957	0.0315
			K	94.8794	1.4577	0.9800	0.9713	0.6651	0.1955	0.1966	0.0280
			M	94.8609	1.4567	0.9779	0.9679	0.6621	0.1958	0.1965	0.0286

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.				(continued)							
49	0.2	A	P	59.7790	13.5849	9.3962	2.5391	4.4654	0.6512	0.3339	0.0000
			K	59.8477	13.6679	9.6043	2.6861	4.8963	1.0064	0.7337	0.0000
			M	59.7800	13.5873	9.4004	2.5439	4.4788	0.6364	0.2771	0.0000
50	0.2	B	P	64.7729	11.8399	8.2645	2.3353	3.9839	0.6451	0.3685	0.0000
			K	64.8350	11.8979	8.4097	2.4396	4.2775	0.8756	0.6369	0.0000
			M	64.7721	11.8389	8.2618	2.3333	3.9790	0.6209	0.3126	0.0000
51	0.2	C	P	69.7676	10.1484	7.2031	1.9512	3.4838	0.6126	0.3984	0.0000
			K	69.8223	10.1869	7.2997	2.0145	3.6664	0.7489	0.5483	0.0000
			M	69.7726	10.1529	7.2145	1.9594	3.5081	0.6303	0.3883	0.0000
52	0.2	D	P	78.2601	7.3590	5.1369	1.4243	2.5752	0.5177	0.3596	0.0000
			K	78.3008	7.3748	5.1737	1.4450	2.6299	0.5349	0.3897	0.0000
			M	78.2623	7.3602	5.1396	1.4254	2.5763	0.5112	0.3534	0.0000
53	0.2	E	P	84.7544	5.0487	5.5253	1.1516	1.7884	0.3911	0.2888	0.0000
			K	84.7843	5.0547	3.5369	1.1560	1.7945	0.3685	0.2634	0.0000
			M	84.7572	5.0497	3.5276	1.1528	1.7899	0.3850	0.2806	0.0000
54	0.2	F	P	94.7475	1.4455	0.9507	0.8970	0.5860	0.1245	0.1018	0.0000
			K	94.7589	1.4455	0.9501	0.8925	0.5801	0.1109	0.0833	0.0000
			M	94.7395	1.4455	0.9501	0.8964	0.5855	0.1225	0.0975	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.				(continued)							
55	0.5	A	P	59.4934	13.1791	8.3570	1.7679	2.2779	0.0008	0.0000	0.0000
			K	59.6193	13.3197	8.6958	1.9751	2.7457	0.0002	0.0000	0.0000
			M	59.5173	13.2118	8.4323	1.8039	2.2555	0.0001	0.0000	0.0000
56	0.5	B	P	64.4719	11.4959	7.3769	1.6483	2.0835	0.0007	0.0000	0.0000
			K	64.5376	11.5948	7.6142	1.7939	2.3987	0.0002	0.0000	0.0000
			M	64.4823	11.5009	7.3932	1.6509	2.0065	0.0001	0.0000	0.0000
57	0.5	C	P	69.4530	9.8607	6.4398	1.3839	1.8665	0.0007	0.0000	0.0000
			K	69.5558	9.9275	6.6092	1.4814	2.0560	0.0002	0.0000	0.0000
			M	69.4618	9.8698	6.4688	1.3980	1.8241	0.0002	0.0000	0.0000
58	0.5	D	P	77.9234	7.1606	4.6235	1.0351	1.4366	0.0005	0.0000	0.0000
			K	78.0019	7.1869	4.6343	1.0626	1.4748	0.0001	0.0000	0.0000
			M	77.9275	7.1634	4.6319	1.0387	1.4161	0.0002	0.0000	0.0000
59	0.5	E	P	84.4024	4.9174	3.1861	0.8425	0.9811	0.0001	0.0000	0.0000
			K	84.4607	4.9254	3.2024	0.8501	1.0063	0.0001	0.0000	0.0000
			M	84.4000	4.9166	3.1854	0.8478	1.0093	0.0001	0.0000	0.0000
60	0.5	F	P	94.3732	1.4091	0.8622	0.6667	0.3367	0.0001	0.0000	0.0000
			K	94.3972	1.4086	0.8602	0.6563	0.3253	0.0000	0.0000	0.0000
			M	94.3766	1.4106	0.8666	0.6825	0.3563	0.0001	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
61	0.8	A	P	59.2139	12.7819	7.3365	0.9790	0.2165	0.0000	0.0000	0.0000
			K	59.3909	12.9715	7.7873	1.2043	0.6807	0.0000	0.0000	0.0000
			M	59.2279	12.7921	7.3481	0.9774	0.2062	0.0000	0.0000	0.0000
62	0.8	B	P	64.1794	11.1557	6.4669	0.9227	0.2350	0.0000	0.0000	0.0000
			K	64.3401	11.2917	6.8187	1.1482	0.5947	0.0000	0.0000	0.0000
			M	64.1790	11.1594	6.4962	0.9367	0.2365	0.0000	0.0000	0.0000
63	0.8	C	P	69.1453	9.5789	5.6903	0.8170	0.2838	0.0000	0.0000	0.0000
			K	69.2893	9.6680	5.9187	0.9482	0.5097	0.0000	0.0000	0.0000
			M	69.1414	9.5780	5.7002	0.8197	0.2708	0.0000	0.0000	0.0000
64	0.8	D	P	77.5932	6.9656	4.1134	0.6357	0.3279	0.0000	0.0000	0.0000
			K	77.7030	6.9990	4.1949	0.6801	0.3656	0.0000	0.0000	0.0000
			M	77.5896	6.9647	4.1196	0.6484	0.3094	0.0000	0.0000	0.0000
65	0.8	E	P	84.0555	4.7879	2.8506	0.5309	0.1873	0.0000	0.0000	0.0000
			K	84.1371	4.7967	2.8678	0.5441	0.2495	0.0000	0.0000	0.0000
			M	84.0454	4.7848	2.8462	0.5454	0.2632	0.0000	0.0000	0.0000
66	0.8	F	P	93.9990	1.3720	0.7719	0.4282	0.0846	0.0000	0.0000	0.0000
			K	94.0355	1.3718	0.7703	0.4201	0.0807	0.0000	0.0000	0.0000
			M	93.9905	1.3729	0.7754	0.4489	0.1105	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$1-C_4H_{10}$	C_4H_{10}	$1-C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
67	1.0	A	P	59.0270	12.5158	6.6480	0.4692	0.0107	0.0000	0.0000	0.0000
			K	59.2385	12.7398	7.1116	0.7922	0.0664	0.0000	0.0000	0.0000
			M	59.0362	12.5260	6.6609	0.4710	0.0100	0.0000	0.0000	0.0000
68	1.0	B	P	63.9813	10.9354	5.9229	0.4724	0.0123	0.0000	0.0000	0.0000
			K	64.1751	11.0097	6.2883	0.7195	0.0580	0.0000	0.0000	0.0000
			M	63.9803	10.9319	5.9050	0.4799	0.0120	0.0000	0.0000	0.0000
69	1.0	C	P	68.9399	9.3902	5.1923	0.4789	0.0126	0.0000	0.0000	0.0000
			K	69.1117	9.4949	5.4583	0.5941	0.0497	0.0000	0.0000	0.0000
			M	68.9357	9.3933	5.2138	0.4587	0.0178	0.0000	0.0000	0.0000
70	1.0	D	P	77.3731	6.8356	3.7715	0.3689	0.0192	0.0000	0.0000	0.0000
			K	77.5038	6.8738	3.8557	0.4262	0.0357	0.0000	0.0000	0.0000
			M	77.3717	6.8366	3.7893	0.3982	0.0236	0.0000	0.0000	0.0000
71	1.0	E	P	83.8244	4.7015	2.6247	0.3086	0.0110	0.0000	0.0000	0.0000
			K	83.9213	4.7108	2.6448	0.3409	0.0243	0.0000	0.0000	0.0000
			M	83.8111	4.6978	2.6219	0.3462	0.0287	0.0000	0.0000	0.0000
72	1.0	F	P	93.7493	1.3472	0.7110	0.2651	0.0072	0.0000	0.0000	0.0000
			K	93.7944	1.3473	0.7104	0.2632	0.0079	0.0000	0.0000	0.0000
			M	93.7321	1.3493	0.7083	0.3028	0.0171	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 90 lb./sq.in.abs.; 90°F. (continued)											
73	1.5	A	P	58.5587	11.8499	4.9052	0.0019	0.0000	0.0000	0.0000	0.0000
			K	58.8579	12.1590	5.6674	0.0364	0.0000	0.0000	0.0000	0.0000
			M	58.5499	11.8326	4.8698	0.0044	0.0000	0.0000	0.0000	0.0000
74	1.5	B	P	63.4920	10.3585	4.3586	0.0040	0.0000	0.0000	0.0000	0.0000
			K	63.7627	10.5849	4.9625	0.0331	0.0000	0.0000	0.0000	0.0000
			M	63.4782	10.3567	4.4104	0.0068	0.0000	0.0000	0.0000	0.0000
75	1.5	C	P	68.4255	8.9169	3.9119	0.0049	0.0000	0.0000	0.0000	0.0000
			K	68.6675	9.0684	4.3075	0.0273	0.0000	0.0000	0.0000	0.0000
			M	68.4059	8.9081	3.9357	0.0087	0.0000	0.0000	0.0000	0.0000
76	1.5	D	P	76.8217	6.5089	2.8965	0.0050	0.0000	0.0000	0.0000	0.0000
			K	77.0057	6.5606	3.0530	0.0196	0.0000	0.0000	0.0000	0.0000
			M	76.8126	6.5079	2.9416	0.0149	0.0000	0.0000	0.0000	0.0000
77	1.5	E	P	83.2440	4.4827	2.0481	0.0075	0.0000	0.0000	0.0000	0.0000
			K	83.3820	4.4962	2.0871	0.0157	0.0000	0.0000	0.0000	0.0000
			M	83.2428	4.4861	2.0779	0.0167	0.0000	0.0000	0.0000	0.0000
78	1.5	F	P	93.1219	1.2836	0.5545	0.0084	0.0000	0.0000	0.0000	0.0000
			K	93.1916	1.2859	0.5606	0.0121	0.0000	0.0000	0.0000	0.0000
			M	93.1021	1.2893	0.5733	0.0246	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
79	2.0	A	P	58.0867	11.1813	3.1783	0.0000	0.0000	0.0000	0.0000	0.0000
			K	58.4771	11.5787	4.1533	0.0003	0.0000	0.0000	0.0000	0.0000
			M	58.0774	11.1591	3.1316	0.0000	0.0000	0.0000	0.0000	0.0000
80	2.0	B	P	62.9995	9.7833	2.8140	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.3502	10.0793	3.6367	0.0003	0.0000	0.0000	0.0000	0.0000
			M	62.9563	9.7589	2.8581	0.0000	0.0000	0.0000	0.0000	0.0000
81	2.0	C	P	67.9115	8.4398	2.5648	0.0000	0.0000	0.0000	0.0000	0.0000
			K	68.2233	8.6299	3.1567	0.0002	0.0000	0.0000	0.0000	0.0000
			M	67.8554	8.4068	2.6155	0.0000	0.0000	0.0000	0.0000	0.0000
82	2.0	D	P	76.2752	6.1944	2.0534	0.0001	0.0000	0.0000	0.0000	0.0000
			K	76.5076	6.2475	2.2373	0.0002	0.0000	0.0000	0.0000	0.0000
			M	76.2339	6.1676	2.0641	0.0001	0.0000	0.0000	0.0000	0.0000
83	2.0	E	P	82.6576	4.2553	1.4370	0.0001	0.0000	0.0000	0.0000	0.0000
			K	82.8426	4.2816	1.5295	0.0001	0.0000	0.0000	0.0000	0.0000
			M	82.6232	4.2555	1.4848	0.0001	0.0000	0.0000	0.0000	0.0000
84	2.0	F	P	92.4946	1.2203	0.3977	0.0001	0.0000	0.0000	0.0000	0.0000
			K	92.5888	1.2245	0.4109	0.0001	0.0000	0.0000	0.0000	0.0000
			M	92.4557	1.2277	0.4246	0.0001	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i-C_4H_{10}$	C_4H_{10}	$i-C_5H_{12}$	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F.											
85	0.1	A	P	59.6725	13.4040	9.1514	2.3469	3.8849	0.7671	0.4628	0.0146
			K	59.8413	13.6603	9.6428	2.7088	4.7507	1.3006	1.0245	0.0014
			M	59.6772	13.4095	9.1539	2.3288	3.7491	0.4007	0.0278	0.0001
86	0.1	B	P	64.6784	11.7083	8.0969	2.1937	3.5583	0.7454	0.4670	0.0157
			K	64.8280	11.8914	8.4433	2.4602	4.1503	1.1316	0.8894	0.0012
			M	64.6770	11.7055	8.0858	2.1727	3.4472	0.4835	0.0677	0.0001
87	0.1	C	P	69.6854	10.0550	7.0932	1.8585	3.1819	0.7057	0.4630	0.0163
			K	69.8148	10.1814	7.3209	2.0316	3.5574	0.9678	0.7656	0.0010
			M	69.6756	10.0450	7.0851	1.8329	3.0750	0.5115	0.3208	0.0001
88	0.1	D	P	78.1976	7.3106	5.0935	1.3817	2.4159	0.5703	0.3869	0.0112
			K	78.2923	7.3707	5.1944	1.4572	2.5517	0.6913	0.5442	0.0007
			M	78.2004	7.3147	5.1017	1.3869	2.4295	0.5495	0.3006	0.0002
89	0.1	E	P	84.7062	5.0235	3.5110	1.1326	1.7285	0.4468	0.3008	0.0003
			K	84.7751	5.0514	3.5511	1.1658	1.7412	0.4762	0.3678	0.0006
			M	84.7145	5.0267	3.5172	1.1366	1.7293	0.4381	0.2858	0.0002
90	0.1	F	P	94.7209	1.4418	0.9509	0.8938	0.5708	0.1478	0.1193	0.0003
			K	94.7847	1.4447	0.9539	0.9001	0.5629	0.1434	0.1163	0.0002
			M	94.7148	1.4410	0.9517	0.8959	0.5793	0.1476	0.1137	0.0003

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
91	0.2	A	P	59.4201	13.0237	8.3483	1.7440	2.0721	0.0049	0.0000	0.0000
			K	59.6825	13.4207	9.0755	2.2575	3.1713	0.1527	0.0064	0.0000
			M	59.4381	13.0460	8.3715	1.7131	1.8384	0.0003	0.0000	0.0000
92	0.2	B	P	64.4199	11.3947	7.4283	1.6687	2.0481	0.0599	0.0019	0.0000
			K	64.6561	11.6828	7.9467	2.0504	2.7705	0.1329	0.0056	0.0000
			M	64.4521	11.4308	7.4900	1.6870	1.9968	0.0019	0.0001	0.0000
93	0.2	C	P	69.4213	9.7999	6.5399	1.4412	1.9229	0.0697	0.0024	0.0000
			K	69.6296	10.0028	6.8978	1.6931	2.3747	0.1136	0.0048	0.0000
			M	69.4398	9.8161	6.5659	1.4427	1.8651	0.0039	0.0001	0.0000
94	0.2	D	P	77.9270	7.1413	4.7257	1.0927	1.4985	0.0555	0.0018	0.0000
			K	78.0847	7.2414	4.8889	1.2145	1.7034	0.0812	0.0034	0.0000
			M	77.9561	7.1591	4.7672	1.1240	1.6144	0.0235	0.0002	0.0000
95	0.2	E	P	84.4332	4.9153	3.2775	0.9154	1.1260	0.0437	0.0008	0.0000
			K	84.5503	4.9628	3.3422	0.9716	1.1623	0.0559	0.0023	0.0000
			M	84.4706	4.9299	3.3097	0.9458	1.2248	0.0534	0.0009	0.0000
96	0.2	F	P	94.4524	1.4144	0.8995	0.7610	0.4419	0.0448	0.0025	0.0000
			K	94.4974	1.4193	0.8978	0.7501	0.3757	0.0168	0.0007	0.0000
			M	94.4525	1.4144	0.8981	0.7541	0.4224	0.0298	0.0011	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
97	0.5	A	P	58.7603	12.0350	6.2676	0.2815	0.0006	0.0000	0.0000	0.0000
			K	59.2063	12.7017	7.3739	0.9406	0.0152	0.0000	0.0000	0.0000
			M	58.7687	12.0285	6.1900	0.1453	0.0003	0.0000	0.0000	0.0000
98	0.5	B	P	63.7311	10.5631	5.6601	0.3401	0.0012	0.0000	0.0000	0.0000
			K	64.1402	11.0569	6.4566	0.8216	0.0133	0.0000	0.0000	0.0000
			M	63.7722	10.6005	5.6729	0.2702	0.0013	0.0000	0.0000	0.0000
99	0.5	C	P	68.7088	9.1145	5.0572	0.3547	0.0018	0.0000	0.0000	0.0000
			K	69.0741	9.4669	5.6044	0.6784	0.0114	0.0000	0.0000	0.0000
			M	68.7206	9.1178	5.0329	0.2783	0.0019	0.0000	0.0000	0.0000
100	0.5	D	P	77.1811	6.6767	3.7394	0.3571	0.0176	0.0000	0.0000	0.0000
			K	77.4616	6.8535	3.9722	0.4866	0.0082	0.0000	0.0000	0.0000
			M	77.2008	6.6857	3.7497	0.3281	0.0080	0.0000	0.0000	0.0000
101	0.5	E	P	83.6640	4.6111	2.6194	0.3437	0.0127	0.0000	0.0000	0.0000
			K	83.8757	4.6969	2.7155	0.3893	0.0056	0.0000	0.0000	0.0000
			M	83.6696	4.6122	2.6284	0.3204	0.0123	0.0000	0.0000	0.0000
102	0.5	F	P	93.6496	1.3330	0.7324	0.3099	0.0050	0.0000	0.0000	0.0000
			K	93.7434	1.3433	0.7294	0.3006	0.0018	0.0000	0.0000	0.0000
			M	93.6491	1.3339	0.7359	0.3255	0.0167	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_5	C_2H_3	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
103	0.8	A	P	58.1258	11.0877	4.3205	0.0013	0.0000	0.0000	0.0000	0.0000
			K	58.7302	11.9828	5.6722	0.0293	0.0000	0.0000	0.0000	0.0000
			M	58.1564	11.0980	4.1777	0.0003	0.0000	0.0000	0.0000	0.0000
104	0.8	B	P	63.0702	9.7682	3.9586	0.0016	0.0000	0.0000	0.0000	0.0000
			K	63.6243	10.4310	4.9666	0.0266	0.0000	0.0000	0.0000	0.0000
			M	63.0817	9.7572	3.8667	0.0006	0.0000	0.0000	0.0000	0.0000
105	0.8	C	P	68.0231	8.4572	3.6132	0.0020	0.0000	0.0000	0.0000	0.0000
			K	68.5185	8.9310	4.3111	0.0220	0.0000	0.0000	0.0000	0.0000
			M	68.0625	8.7880	3.6300	0.0015	0.0000	0.0000	0.0000	0.0000
106	0.8	D	P	76.4560	6.2260	2.7668	0.0019	0.0000	0.0000	0.0000	0.0000
			K	76.8386	6.4655	3.0555	0.0158	0.0000	0.0000	0.0000	0.0000
			M	76.4730	6.2295	2.7692	0.0034	0.0000	0.0000	0.0000	0.0000
107	0.8	E	P	82.9095	4.3134	1.9601	0.0044	0.0000	0.0000	0.0000	0.0000
			K	83.2011	4.4310	2.0889	0.0126	0.0000	0.0000	0.0000	0.0000
			M	82.9020	4.3077	1.9755	0.0055	0.0000	0.0000	0.0000	0.0000
108	0.8	F	P	92.8476	1.2522	0.5558	0.0061	0.0000	0.0000	0.0000	0.0000
			K	92.9894	1.2672	0.5611	0.0097	0.0000	0.0000	0.0000	0.0000
			M	92.8753	1.2543	0.5756	0.0177	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
109	1.0	A	P	57.7074	10.4651	2.8521	0.0000	0.0000	0.0000	0.0000	0.0000
			K	58.4127	11.5034	4.5377	0.0008	0.0000	0.0000	0.0000	0.0000
			M	57.7253	10.4427	2.7705	0.0000	0.0000	0.0000	0.0000	0.0000
110	1.0	B	P	62.6318	9.2418	2.7730	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.2804	10.0138	3.9733	0.0007	0.0000	0.0000	0.0000	0.0000
			M	62.6793	9.2659	2.8036	0.0000	0.0000	0.0000	0.0000	0.0000
111	1.0	C	P	67.5678	8.0209	2.6346	0.0000	0.0000	0.0000	0.0000	0.0000
			K	68.1481	8.5738	3.4489	0.0006	0.0000	0.0000	0.0000	0.0000
			M	67.5858	8.0160	2.6144	0.0000	0.0000	0.0000	0.0000	0.0000
112	1.0	D	P	75.9755	5.9254	2.0544	0.0001	0.0000	0.0000	0.0000	0.0000
			K	76.4233	6.2069	2.4444	0.0004	0.0000	0.0000	0.0000	0.0000
			M	75.9763	5.9182	2.1001	0.0001	0.0000	0.0000	0.0000	0.0000
113	1.0	E	P	82.4085	4.1158	1.4963	0.0001	0.0000	0.0000	0.0000	0.0000
			K	82.7513	4.2538	1.6711	0.0003	0.0000	0.0000	0.0000	0.0000
			M	82.3897	4.1044	1.5397	0.0001	0.0000	0.0000	0.0000	0.0000
114	1.0	F	P	92.3136	1.1985	0.4349	0.0001	0.0000	0.0000	0.0000	0.0000
			K	92.4868	1.2166	0.4489	0.0003	0.0000	0.0000	0.0000	0.0000
			M	92.3062	1.1965	0.4593	0.0004	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
115	1.5	A	P	56.6416	8.8661	0.1313	0.0000	0.0000	0.0000	0.0000	0.0000
			K	57.6190	10.3052	1.7394	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.6389	8.7917	0.2094	0.0000	0.0000	0.0000	0.0000	0.0000
116	1.5	B	P	61.5263	7.9091	0.2460	0.0000	0.0000	0.0000	0.0000	0.0000
			K	62.4206	8.9707	1.5230	0.0000	0.0000	0.0000	0.0000	0.0000
			M	61.5196	7.8495	0.3131	0.0000	0.0000	0.0000	0.0000	0.0000
117	1.5	C	P	66.4234	6.9233	0.4314	0.0000	0.0000	0.0000	0.0000	0.0000
			K	67.2222	7.6807	1.3220	0.0000	0.0000	0.0000	0.0000	0.0000
			M	66.4271	6.8909	0.4423	0.0000	0.0000	0.0000	0.0000	0.0000
118	1.5	D	P	74.7711	5.1756	0.4328	0.0000	0.0000	0.0000	0.0000	0.0000
			K	75.3849	5.5603	0.9370	0.0000	0.0000	0.0000	0.0000	0.0000
			M	74.7488	5.1488	0.5372	0.0000	0.0000	0.0000	0.0000	0.0000
119	1.5	E	P	81.1644	3.6236	0.4250	0.0000	0.0000	0.0000	0.0000	0.0000
			K	81.6270	3.8107	0.6406	0.0000	0.0000	0.0000	0.0000	0.0000
			M	81.0992	3.5925	0.4765	0.0000	0.0000	0.0000	0.0000	0.0000
120	1.5	F	P	90.9787	1.0643	0.1393	0.0000	0.0000	0.0000	0.0000	0.0000
			K	91.2302	1.0898	0.1721	0.0000	0.0000	0.0000	0.0000	0.0000
			M	90.9367	1.0575	0.1823	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
121	2.0	A	F	55.5232	7.1489	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.8254	9.1069	0.1394	0.0000	0.0000	0.0000	0.0000	0.0000
			M	55.5685	7.1648	0.0027	0.0000	0.0000	0.0000	0.0000	0.0000
122	2.0	B	F	60.3725	6.4874	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000
			K	61.5608	7.9276	0.1220	0.0000	0.0000	0.0000	0.0000	0.0000
			M	60.3534	6.4253	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000
123	2.0	C	F	65.2397	5.7653	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000
			K	66.2963	6.7876	0.1059	0.0000	0.0000	0.0000	0.0000	0.0000
			M	65.2348	5.7332	0.0084	0.0000	0.0000	0.0000	0.0000	0.0000
124	2.0	D	F	73.5367	4.4003	0.0059	0.0000	0.0000	0.0000	0.0000	0.0000
			K	74.3466	4.9138	0.0751	0.0000	0.0000	0.0000	0.0000	0.0000
			M	73.5537	4.3997	0.0210	0.0000	0.0000	0.0000	0.0000	0.0000
125	2.0	E	F	79.8830	3.1174	0.0096	0.0000	0.0000	0.0000	0.0000	0.0000
			K	80.5026	3.3676	0.0513	0.0000	0.0000	0.0000	0.0000	0.0000
			M	79.8737	3.1063	0.0280	0.0000	0.0000	0.0000	0.0000	0.0000
126	2.0	F	F	89.6418	0.9296	0.0065	0.0000	0.0000	0.0000	0.0000	0.0000
			K	89.9735	0.9631	0.0138	0.0000	0.0000	0.0000	0.0000	0.0000
			M	89.6367	0.9255	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F.											
127	0.1	A	P	56.8006	10.7062	4.7036	0.3056	0.0602	0.0000	0.0000	0.0000
			K	59.2536	13.0421	8.3021	1.9099	2.5748	0.0979	0.0004	0.0000
			M	57.2312	10.9271	4.2199	0.0122	0.0001	0.0000	0.0000	0.0000
128	0.1	B	P	62.0201	9.6670	4.5731	0.3849	0.0994	0.0000	0.0000	0.0000
			K	64.1909	11.3532	7.2694	1.7347	2.2494	0.0352	0.0003	0.0000
			M	62.3233	9.7906	4.2596	0.1280	0.0001	0.0000	0.0000	0.0000
129	0.1	C	P	67.2592	8.5536	4.3692	0.4280	0.1539	0.0002	0.0000	0.0000
			K	69.1287	9.7206	6.3099	1.4325	1.9281	0.0728	0.0003	0.0000
			M	67.4702	8.6247	4.1945	0.0643	0.0003	0.0001	0.0000	0.0000
130	0.1	D	P	76.1641	6.4862	3.5515	0.4670	0.2422	0.0002	0.0000	0.0000
			K	77.5229	7.0371	4.4722	1.0275	1.3830	0.0520	0.0002	0.0000
			M	76.1995	6.4813	3.4508	0.2579	0.0076	0.0001	0.0000	0.0000
131	0.1	E	P	82.9811	4.5807	2.6707	0.5321	0.4729	0.0189	0.0004	0.0000
			K	83.9420	4.8227	3.0574	0.8220	0.9437	0.0358	0.0001	0.0000
			M	82.9316	4.5771	2.6305	0.4240	0.1000	0.0001	0.0001	0.0000
132	0.1	F	P	93.3169	1.3495	0.7834	0.5207	0.2163	0.0258	0.0000	0.0000
			K	93.8176	1.3793	0.8213	0.6346	0.3051	0.0308	0.0000	0.0000
			M	93.2911	1.3474	0.7790	0.4998	0.1737	0.0011	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
133	0.2	A	P	55.3773	9.3392	2.5547	0.0005	0.0000	0.0000	0.0000	0.0000
			K	58.5604	12.1841	6.3942	0.6648	0.0335	0.0000	0.0000	0.0000
			M	55.9629	9.5653	1.5339	0.0001	0.0000	0.0000	0.0000	0.0000
134	0.2	B	P	60.5785	8.5300	2.6913	0.0016	0.0000	0.0000	0.0000	0.0000
			K	63.3819	10.6063	5.5989	0.6038	0.0292	0.0000	0.0000	0.0000
			M	61.2485	8.8633	2.3837	0.0001	0.0000	0.0000	0.0000	0.0000
135	0.2	C	P	65.7937	7.6199	2.7359	0.0042	0.0000	0.0000	0.0000	0.0000
			K	68.2575	9.0811	4.8599	0.4986	0.0251	0.0000	0.0000	0.0000
			M	65.8510	7.5219	1.9335	0.0001	0.0000	0.0000	0.0000	0.0000
136	0.2	D	P	74.6840	5.8585	2.4133	0.0165	0.0000	0.0000	0.0000	0.0000
			K	76.5459	6.5742	3.4445	0.3576	0.0179	0.0000	0.0000	0.0000
			M	74.8510	5.8842	2.2497	0.0010	0.0000	0.0000	0.0000	0.0000
137	0.2	E	P	81.4658	4.1663	1.8799	0.0626	0.0007	0.0000	0.0000	0.0000
			K	82.8841	4.5055	2.3548	0.2861	0.0123	0.0000	0.0000	0.0000
			M	81.6226	4.1934	1.8606	0.0104	0.0001	0.0000	0.0000	0.0000
138	0.2	F	P	91.8369	1.2433	0.5852	0.1314	0.0016	0.0000	0.0000	0.0000
			K	92.6351	1.2835	0.6325	0.2209	0.0039	0.0000	0.0000	0.0000
			M	92.0429	1.2579	0.6103	0.1123	0.0009	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
139	0.5	A	P	51.4032	5.5562	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.2660	9.6103	0.8825	0.0000	0.0000	0.0000	0.0000	0.0000
			M	51.6444	4.9289	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
140	0.5	B	P	56.5336	5.3524	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000
			K	60.9548	8.3657	0.7727	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.7713	5.0005	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
141	0.5	C	P	51.4032	5.5562	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.2660	9.6103	0.8825	0.0000	0.0000	0.0000	0.0000	0.0000
			M	51.6444	4.9289	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
142	0.5	D	P	56.5336	5.3524	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000
			K	60.9548	8.3658	0.7727	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.7713	5.0005	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
143	0.5	E	P	61.6918	5.0045	0.0099	0.0000	0.0000	0.0000	0.0000	0.0000
			K	65.6437	7.1628	0.6707	0.0000	0.0000	0.0000	0.0000	0.0000
			M	61.7452	4.6977	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000
144	0.5	F	P	70.5057	4.0801	0.0283	0.0000	0.0000	0.0000	0.0000	0.0000
			K	73.6147	5.1854	0.4754	0.0000	0.0000	0.0000	0.0000	0.0000
			M	70.5623	3.9851	0.0061	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
145	0.8	A	P	47.5626	1.7573	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	54.0256	7.0364	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000
			M	47.8253	1.1425	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
146	0.8	B	P	52.6312	2.1214	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	58.5277	6.1252	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
			M	52.9481	1.7755	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
147	0.8	C	P	57.7267	2.3736	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.0299	5.2844	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000
			M	57.8123	2.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
148	0.8	D	P	66.4419	2.4016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	70.6835	3.7966	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000
			M	66.6982	2.2752	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
149	0.8	E	P	73.1270	1.8895	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	76.5363	2.6019	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
			M	73.3294	1.8693	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
150	0.8	F	P	83.3925	0.6357	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	85.5405	0.7441	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
			M	83.4632	0.6426	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
151	1.0	A	P	44.9061	0.1289	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.5320	5.3207	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	44.9668	0.5147	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
152	1.0	B	P	49.9772	0.5147	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.9097	4.6317	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	50.0464	0.2816	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
153	1.0	C	P	55.0631	0.8739	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	61.2873	3.9657	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	55.1967	0.5985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
154	1.0	D	P	63.7421	1.2053	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	68.7294	2.8709	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	63.7959	1.0424	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
155	1.0	E	P	70.3786	1.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	74.4203	1.9675	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	70.5055	1.0854	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
156	1.0	F	P	80.5694	0.4197	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	83.1757	0.5627	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	80.4338	0.4257	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i-C_4H_{10}$	C_4H_{10}	$i-C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
157	1.5	A	P	37.8555	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	48.7980	1.2857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	37.7844	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
158	1.5	B	P	42.9645	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.8645	1.1192	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	42.9759	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
159	1.5	C	P	48.0856	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.9310	0.9583	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	47.9968	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
160	1.5	D	P	56.8001	0.0072	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.8441	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.5042	0.0093	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
161	1.5	E	P	63.4094	0.0180	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	69.1305	0.4754	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	63.3882	0.0301	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
162	1.5	F	P	73.4936	0.0264	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	77.2635	0.1360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	73.2816	0.0369	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE III (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
163	2.0	A	P	30.7902	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	45.0640	0.3960	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	30.6906	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
164	2.0	B	P	35.8958	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	48.8193	0.0344	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	35.8754	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
165	2.0	C	P	41.0224	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.5747	0.0295	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	41.0399	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
166	2.0	D	P	49.7578	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	58.9588	0.0213	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	49.7339	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
167	2.0	E	P	56.4119	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.8407	0.0146	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.4365	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
168	2.0	F	P	66.4021	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	71.3514	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	66.3753	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE IV

COMPOSITION OF EFFLUENT GAS (Y_N): 10-PLATE COLUMN

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F.											
169	0.1	A	P	59.9708	13.8321	10.0367	3.0245	5.8831	2.1564	2.1630	0.5824
			K	59.9755	13.8552	10.0966	3.0597	6.0487	2.2578	2.3344	0.7533
			M	59.9717	13.8523	10.0932	3.0561	6.0418	2.2531	2.3302	0.7481
170	0.1	B	P	64.9693	12.0426	8.7926	2.7505	5.1508	1.8859	1.8919	0.5182
			K	64.9735	12.0610	8.8407	2.7789	5.2842	1.9644	2.0265	0.6533
			M	64.9705	12.0599	8.8416	2.7792	5.2876	1.9697	2.0359	0.6611
171	0.1	C	P	69.9683	10.3128	7.6371	2.2752	4.4278	1.6237	1.6446	0.4592
			K	69.9714	10.3266	7.6738	2.2948	4.5293	1.6800	1.7444	0.5599
			M	69.9689	10.3265	7.6764	2.2966	4.5367	1.6889	1.7586	0.5726
172	0.1	D	P	78.4644	7.4659	5.4129	1.6380	3.1762	1.1598	1.1690	0.3280
			K	78.4679	7.4758	5.4389	1.6460	3.2489	1.1999	1.2399	0.3999
			M	78.4657	7.4761	5.4417	1.6482	3.2565	1.2086	1.2531	0.4119
173	0.1	E	P	84.9631	5.1230	3.7177	1.3161	2.2160	0.8259	0.8378	0.3412
			K	84.9653	5.1234	3.7182	1.3168	2.2169	0.8267	0.8380	0.3400
			M	84.9615	5.1230	3.7186	1.3170	2.2184	0.8289	0.8419	0.3442
174	0.1	F	P	94.9603	1.4652	0.9988	1.0165	0.7167	0.2489	0.2652	0.0870
			K	94.9612	1.4652	0.9988	1.0167	0.7167	0.2489	0.2651	0.0867
			M	94.9544	1.4648	0.9982	1.0148	0.7152	0.2477	0.2637	0.0852

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
175	0.2	A	P	59.9440	13.8103	9.9973	2.9734	5.8099	2.0421	2.0406	0.4990
			K	59.9510	13.8103	9.9831	2.9594	5.7673	1.9755	1.9387	0.3810
			M	59.9465	13.8097	9.9891	2.9635	5.7848	1.9973	1.9737	0.4105
176	0.2	B	P	64.9407	12.0224	8.7537	2.6999	5.0749	1.7731	1.7662	0.4259
			K	64.9469	12.0219	8.7413	2.6878	5.0384	1.7188	1.6831	0.3304
			M	64.9434	12.0232	8.7510	2.6596	5.0645	1.7485	1.7283	0.3697
177	0.2	C	P	69.9370	10.2939	7.5980	2.2289	4.3485	1.5124	1.5145	0.3581
			K	69.9429	10.2932	7.5876	2.2195	4.3187	1.4700	1.4487	0.2832
			M	69.9399	10.2951	7.5981	2.2279	4.3464	1.5006	1.4951	0.3237
178	0.2	D	P	78.4311	7.4524	5.3845	1.5978	3.1169	1.0748	1.0685	0.2459
			K	78.4359	7.4516	5.3778	1.5921	3.0978	1.0499	1.0297	0.2023
			M	78.4333	7.4535	5.3865	1.5992	3.1207	1.0749	1.0668	0.2351
179	0.2	E	P	84.9267	5.1074	3.6805	1.2775	2.1252	0.7372	0.7175	0.2020
			K	84.9306	5.1068	3.6764	1.2737	2.1138	0.7233	0.6959	0.1720
			M	84.9264	5.1075	3.6809	1.2778	2.1257	0.7368	0.7160	0.1939
180	0.2	F	P	94.2907	1.4606	0.9880	0.9843	0.6848	0.2191	0.2225	0.0464
			K	94.9224	1.4305	0.9876	0.9833	0.6833	0.2178	0.2201	0.0438
			M	94.9148	1.4604	0.9880	0.9843	0.6849	0.2197	0.2235	0.0466

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
181	0.5	A	P	59.8639	13.6874	9.7180	2.7343	5.1337	1.4187	1.1723	0.0161
			K	59.8776	13.6758	9.6428	2.6584	4.9233	1.1305	0.7742	0.0027
			M	59.8686	13.6780	9.6671	2.6771	4.9902	1.2073	0.8842	0.0045
182	0.5	B	P	64.8541	11.9146	8.5042	2.4764	4.4693	1.2082	0.9812	0.0113
			K	64.8673	11.9048	8.4433	2.4145	4.3011	0.9837	0.6721	0.0024
			M	64.8578	11.9069	8.4651	2.4318	4.3606	1.0514	0.7689	0.0039
183	0.5	C	P	69.8446	10.2009	7.3771	2.0391	3.8170	1.0098	0.8115	0.0077
			K	69.8571	10.1929	7.3289	1.9938	3.6867	0.8412	0.5785	0.0020
			M	69.8475	10.1954	7.3494	2.0096	3.7416	1.0310	0.6671	0.0035
184	0.5	D	P	78.3290	7.3839	5.2213	1.4540	2.7172	0.6883	0.5314	0.0037
			K	78.3400	7.3790	5.1944	1.4302	2.6444	0.6009	0.4112	0.0015
			M	78.3260	7.3787	5.2038	1.4369	2.6712	0.6327	0.4579	0.0022
185	0.5	E	P	84.8176	5.0599	3.5654	1.1580	1.8428	0.4568	0.3355	0.0024
			K	84.8265	5.0571	3.5511	1.1441	1.8044	0.4139	0.2779	0.0012
			M	84.8178	5.0596	3.5642	1.1565	1.8391	0.4521	0.3304	0.0024
186	0.5	F	P	94.8020	1.4466	0.9552	0.8862	0.5875	0.1282	0.0931	0.0004
			K	94.8061	1.4463	0.9539	0.8833	0.5833	0.1246	0.0819	0.0003
			M	94.7944	1.4468	0.9569	0.8914	0.5931	0.1347	0.1027	0.0005

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
187	0.8	A	P	59.7768	13.5226	9.2853	2.3322	4.0213	0.3396	0.1091	0.0000
			K	59.8041	13.5413	9.3024	2.3575	4.0794	0.3885	0.1065	0.0000
			M	59.7753	13.5203	9.2815	2.3341	4.0384	0.3731	0.1034	0.0000
188	0.8	B	P	64.7623	11.7771	8.1446	2.1327	3.5540	0.3068	0.0806	0.0000
			K	64.7878	11.7877	8.1453	2.1411	3.5638	0.3380	0.0924	0.0000
			M	64.7607	11.7751	8.1408	2.1327	3.5621	0.3470	0.1002	0.0000
189	0.8	C	P	69.4783	10.0883	7.0818	1.7727	3.0804	0.2762	0.0716	0.0000
			K	69.7714	10.0926	7.0702	1.7681	3.0547	0.2891	0.0796	0.0000
			M	69.7450	10.0848	7.0736	1.7676	3.0710	0.3068	0.0922	0.0000
190	0.8	D	P	78.2270	7.3139	5.0514	1.3027	2.2965	0.2820	0.0951	0.0000
			K	78.2437	7.3065	5.0111	1.2683	2.1911	0.2065	0.0565	0.0000
			M	78.2299	7.3118	5.0405	1.2918	2.2693	0.2666	0.0920	0.0000
191	0.8	E	P	84.7087	5.0114	3.4467	1.0339	1.5487	0.1752	0.0540	0.0000
			K	84.7225	5.0074	3.4258	1.0146	1.4951	0.1422	0.0382	0.0000
			M	84.7067	5.0106	3.4449	1.0325	1.5461	0.1832	0.0611	0.0000
192	0.8	F	P	94.6834	1.4324	0.9219	0.7867	0.4884	0.0449	0.0131	0.0000
			K	94.6698	1.4321	0.9202	0.7834	0.4833	0.0428	0.0121	0.0000
			M	94.6756	1.4334	0.9262	0.7998	0.5024	0.0570	0.0205	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
193	1.0	A	P	59.7220	13.4299	9.0558	2.1215	3.4278	0.1086	0.0179	0.0000
			K	59.7551	13.4516	9.0755	2.1569	3.1571	0.1290	0.0211	0.0000
			M	59.7197	13.4264	9.0517	2.1297	3.4719	0.1227	0.0207	0.0000
194	1.0	B	P	64.7039	11.6976	7.9472	1.9449	3.0419	0.0948	0.0153	0.0000
			K	64.7347	11.7097	7.9467	1.9590	3.0726	0.1122	0.0183	0.0000
			M	64.7007	11.6935	7.9401	1.9475	3.0684	0.1164	0.0200	0.0000
195	1.0	C	P	69.6823	10.0212	6.9133	1.6211	2.6509	0.0793	0.0122	0.0000
			K	69.7143	10.0258	6.8978	1.6177	2.6337	0.0960	0.0157	0.0000
			M	69.6636	10.0185	6.9083	1.6224	2.6692	0.1111	0.0200	0.0000
196	1.0	D	P	78.1588	7.2659	4.9329	1.1955	1.9964	0.0926	0.0166	0.0000
			K	78.1795	7.2581	4.8889	1.1604	1.8891	0.0886	0.0112	0.0000
			M	78.1645	7.2662	4.9292	1.1929	1.9955	0.1002	0.0218	0.0000
197	1.0	E	P	84.6360	4.9781	3.3637	0.9463	1.3398	0.0562	0.0095	0.0000
			K	84.6531	4.9742	3.3422	0.9283	1.2891	0.0472	0.0076	0.0000
			M	84.6295	4.9766	3.3620	0.9463	1.3425	0.0670	0.0127	0.0000
198	1.0	F	P	94.6043	1.4229	0.8995	0.7198	0.4216	0.0147	0.0025	0.0000
			K	94.6122	1.4226	0.8978	0.7167	0.4167	0.0142	0.0024	0.0000
			M	94.5943	1.4242	0.9052	0.7370	0.4404	0.0225	0.0047	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
199	1.5	A	P	59.5854	13.1989	8.4825	1.5885	1.9222	0.0031	0.0003	0.0000
			K	59.6327	13.2274	8.5083	1.6558	2.1347	0.0062	0.0006	0.0000
			M	59.5774	13.1858	8.4634	1.6070	2.0492	0.0055	0.0006	0.0000
200	1.5	B	P	64.5580	11.4995	7.4551	1.4743	1.7667	0.0031	0.0003	0.0000
			K	64.6020	11.5145	7.4500	1.5038	1.8649	0.0054	0.0005	0.0000
			M	64.5503	11.4893	7.4378	1.4845	1.8532	0.0055	0.0005	0.0000
201	1.5	C	P	69.5334	9.8660	6.5379	1.2848	1.7067	0.0049	0.0005	0.0000
			K	69.5714	9.8587	6.4667	1.2419	1.5985	0.0046	0.0005	0.0000
			M	69.5381	9.8614	6.5166	1.2789	1.7289	0.0071	0.0008	0.0000
202	1.5	D	P	77.9875	7.1412	4.6195	0.9093	1.1992	0.0033	0.0003	0.0000
			K	78.0194	7.3171	4.5833	0.8908	1.1466	0.0033	0.0003	0.0000
			M	77.9730	7.1327	4.6032	0.9036	1.2035	0.0044	0.0004	0.0000
203	1.5	E	P	84.4537	4.8931	3.1496	0.7201	0.8037	0.0022	0.0002	0.0000
			K	84.4796	4.8913	3.1333	0.7126	0.7824	0.0023	0.0002	0.0000
			M	84.4304	4.8887	3.1480	0.7240	0.8238	0.0030	0.0003	0.0000
204	1.5	F	P	94.4067	1.3990	0.8429	0.5508	0.2549	0.0007	0.0001	0.0000
			K	94.4184	1.3989	0.8417	0.5502	0.2529	0.0007	0.0001	0.0000
			M	94.3808	1.4001	0.8501	0.5724	0.2791	0.0012	0.0001	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
205	2.0	A	P	59.4479	12.9648	7.8979	1.0367	0.7100	0.0002	0.0000	0.0000
			K	59.5102	13.0032	7.9411	1.1616	0.9684	0.0005	0.0000	0.0000
			M	59.4227	12.9244	7.8242	1.0510	0.8050	0.0003	0.0000	0.0000
206	2.0	B	P	64.4113	11.2993	6.9531	0.9841	0.6829	0.0002	0.0000	0.0000
			K	64.4694	11.3194	6.9533	1.0550	0.8460	0.0004	0.0000	0.0000
			M	64.3931	11.2759	6.9127	1.0087	0.7963	0.0004	0.0000	0.0000
207	2.0	C	P	69.3776	9.6969	6.1096	0.8904	0.7398	0.0003	0.0000	0.0000
			K	69.4286	9.6916	6.0355	0.8912	0.7252	0.0004	0.0000	0.0000
			M	69.3601	9.6692	6.0373	0.8641	0.7415	0.0004	0.0000	0.0000
208	2.0	D	P	77.8166	7.0191	4.3144	0.6302	0.5238	0.0002	0.0000	0.0000
			K	77.8592	6.0161	4.2778	0.6249	0.5202	0.0003	0.0000	0.0000
			M	78.8019	7.0135	4.3122	0.6483	0.5886	0.0004	0.0000	0.0000
209	2.0	E	P	84.2718	4.8095	2.9404	0.4995	0.3532	0.0002	0.0000	0.0000
			K	84.3061	4.8084	2.9244	0.4999	0.3549	0.0002	0.0000	0.0000
			M	84.2424	4.8058	2.9461	0.5167	0.3984	0.0003	0.0000	0.0000
210	2.0	F	P	94.2090	1.3752	0.7868	0.3847	0.1144	0.0000	0.0000	0.0000
			K	94.2245	1.3752	0.7856	0.3860	0.1147	0.0000	0.0000	0.0000
			M	94.1735	1.3767	0.7966	0.4141	0.1400	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.											
211	0.1	A	P	59.8959	13.7593	9.8543	2.9023	5.5762	1.8175	1.7996	0.3989
			K	59.9239	13.7839	9.9072	2.9231	5.6131	1.7732	1.7314	0.2605
			M	59.8965	13.7525	9.8289	2.8693	5.4565	1.6411	1.5531	0.1507
212	0.1	B	P	64.8909	11.9804	8.6342	2.6379	4.8736	1.5782	1.5567	0.3382
			K	64.9175	11.9990	8.6748	2.6548	4.9037	1.5428	1.5031	0.2259
			M	64.8931	11.9775	8.6218	2.6182	4.8022	1.4604	1.3955	0.1575
213	0.1	C	P	69.8864	10.2600	7.4995	2.1799	4.1792	1.3466	1.3347	0.2824
			K	69.9112	10.2735	7.5298	2.1923	4.2032	1.3194	1.2938	0.1936
			M	69.8915	10.2612	7.4996	2.1740	4.1520	1.2887	1.2493	0.1659
214	0.1	D	P	78.3801	7.4303	5.3211	1.5655	2.9998	0.9569	0.9411	0.1906
			K	78.4004	7.4374	5.3369	1.5725	3.0150	0.9424	0.9196	0.1383
			M	78.3851	7.4324	5.3258	1.5673	3.0018	0.9445	0.9195	0.1408
215	0.1	E	P	84.8759	5.0936	3.6407	1.2538	2.0491	0.6576	0.6336	0.1556
			K	84.8921	5.0971	3.6485	1.2580	2.0573	0.6492	0.6215	0.1176
			M	84.8690	5.0913	3.6346	1.2482	2.0339	0.6359	0.6024	0.1027
216	0.1	F	P	94.8723	1.4573	0.9790	0.9690	0.6627	0.1951	0.1963	0.0329
			K	94.8794	1.4578	0.9800	0.9713	0.6651	0.1955	0.1966	0.0299
			M	94.8608	1.4568	0.9789	0.9680	0.6621	0.1958	0.1964	0.0305

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
217	0.2	A	P	59.7802	13.5865	9.3997	2.5408	4.4700	0.7080	0.4561	0.0024
			K	59.8477	13.6679	9.6043	2.6861	4.8963	1.0103	0.7570	0.0045
			M	59.7807	13.5873	9.4023	2.5439	4.4788	0.6629	0.3742	0.0007
218	0.2	B	P	64.7735	11.8406	8.2659	2.3358	3.9833	0.6519	0.4370	0.0025
			K	64.8350	11.8979	8.4097	2.4396	4.2775	0.8790	0.6572	0.0039
			M	64.7721	11.8390	8.2618	2.3334	3.9790	0.6373	0.3827	0.0009
219	0.2	C	P	69.7678	10.1485	7.2034	1.9513	3.4835	0.6155	0.4156	0.0021
			K	69.8223	10.1870	7.2997	2.0145	3.6664	0.7518	0.5657	0.0033
			M	69.7726	10.1529	7.2144	1.9594	3.5081	0.6375	0.4266	0.0015
220	0.2	D	P	78.2602	7.3591	5.1370	1.4243	2.5750	0.5164	0.3724	0.0021
			K	78.3008	7.3748	5.1737	1.4450	2.6299	0.5370	0.4021	0.0024
			M	78.2623	7.3602	5.1396	1.4254	2.5763	0.5139	0.3697	0.0019
221	0.2	E	P	84.7545	5.0487	3.5253	1.1515	1.7882	0.3903	0.2924	0.0027
			K	84.7843	5.0542	3.5370	1.1560	1.7945	0.3699	0.2718	0.0020
			M	84.7572	5.0497	3.5276	1.1528	1.7899	0.3861	0.2874	0.0026
222	0.2	F	P	94.7476	1.4455	0.9508	0.8972	0.5863	0.1250	0.1031	0.0012
			K	94.7589	1.4455	0.9501	0.8925	0.5801	0.1114	0.0860	0.0005
			M	94.7395	1.4452	0.9501	0.8964	0.5855	0.1227	0.0991	0.0009

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
223	0.5	A	P	54.4935	13.1792	8.3574	1.7680	2.2789	0.0152	0.0032	0.0000
			K	54.6193	13.3197	8.6958	1.9752	2.7510	0.0141	0.0029	0.0000
			M	54.5173	13.2118	8.4323	1.8041	2.2732	0.0067	0.0013	0.0000
224	0.5	B	P	64.4720	11.4961	7.3721	1.6484	2.0893	0.0150	0.0031	0.0000
			K	64.5876	11.5948	7.6142	1.7439	2.4033	0.0123	0.0028	0.0000
			M	64.4823	11.5069	7.3992	1.6510	2.0205	0.0063	0.0012	0.0000
225	0.5	C	P	69.4531	9.8608	6.4400	1.3037	1.8661	0.0157	0.0033	0.0000
			K	69.5578	9.9275	6.6092	1.4814	2.0600	0.0105	0.0022	0.0000
			M	69.4618	9.8698	6.4687	1.3981	1.8328	0.0073	0.0014	0.0000
226	0.5	D	P	77.9235	7.1607	4.6237	1.0350	1.4304	0.0121	0.0025	0.0000
			K	78.0019	7.1869	4.6843	1.0626	1.4776	0.0075	0.0015	0.0000
			M	77.9275	7.1634	4.6319	1.0387	1.4199	0.0080	0.0016	0.0000
227	0.5	E	P	84.4024	4.9174	3.1861	0.8424	0.9822	0.0052	0.0010	0.0000
			K	84.4607	4.9254	3.2024	0.8501	1.0083	0.0052	0.0011	0.0000
			M	84.3998	4.9166	3.1854	0.8478	1.0111	0.0072	0.0014	0.0000
228	0.5	F	P	94.3732	1.4091	0.8622	0.6666	0.3370	0.0021	0.0004	0.0000
			K	94.3972	1.4086	0.8602	0.6563	0.3259	0.0016	0.0003	0.0000
			M	94.3766	1.4106	0.8666	0.6824	0.3565	0.0038	0.0008	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
229	0.8	A	P	59.2137	12.7817	7.3355	1.0021	0.5281	0.0001	0.0000	0.0000
			K	59.3909	12.9715	7.7873	1.2688	0.8983	0.0002	0.0000	0.0000
			M	59.2228	12.7920	7.3481	0.9939	0.4785	0.0001	0.0000	0.0000
230	0.8	B	P	64.1774	11.1595	6.5055	0.9648	0.5255	0.0001	0.0000	0.0000
			K	64.3401	11.2917	6.8187	1.1529	0.7848	0.0002	0.0000	0.0000
			M	64.1789	11.1595	6.4963	0.9488	0.4766	0.0001	0.0000	0.0000
231	0.8	C	P	69.1451	9.5785	5.6915	0.8447	0.5519	0.0002	0.0000	0.0000
			K	69.2893	9.6680	5.9187	0.9516	0.6727	0.0002	0.0000	0.0000
			M	69.1414	9.5780	5.7002	0.8273	0.4726	0.0002	0.0000	0.0000
232	0.8	D	P	77.5932	6.9657	4.1126	0.6337	0.4095	0.0001	0.0000	0.0000
			K	77.7030	6.9990	4.1949	0.6826	0.4825	0.0001	0.0000	0.0000
			M	77.5896	6.9647	4.1196	0.6517	0.4370	0.0001	0.0000	0.0000
233	0.8	E	P	84.0555	4.7878	2.8498	0.5306	0.2863	0.0001	0.0000	0.0000
			K	84.1371	4.7967	2.8678	0.5461	0.3293	0.0001	0.0000	0.0000
			M	84.0454	4.7848	2.8462	0.5473	0.3403	0.0001	0.0000	0.0000
234	0.8	F	P	93.9989	1.3720	0.7717	0.4283	0.1091	0.0000	0.0000	0.0000
			K	94.0355	1.3718	0.7703	0.4216	0.1064	0.0000	0.0000	0.0000
			M	93.8805	1.3729	0.7754	0.4499	0.1304	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
235	1.0	A	P	59.0263	12.5142	6.6420	0.5189	0.1039	0.0000	0.0000	0.0000
			K	59.2386	12.7394	7.1816	0.8251	0.2863	0.0000	0.0000	0.0000
			M	59.0362	12.5260	6.6609	0.5537	0.1220	0.0000	0.0000	0.0000
236	1.0	B	P	63.9811	10.9351	5.9210	0.5318	0.1151	0.0000	0.0000	0.0000
			K	64.1751	11.0897	6.2883	0.7494	0.2501	0.0000	0.0000	0.0000
			M	63.9803	10.9319	5.9050	0.5454	0.1262	0.0000	0.0000	0.0000
237	1.0	C	P	68.9399	9.3900	5.1893	0.4996	0.1379	0.0000	0.0000	0.0000
			K	69.1117	9.4949	5.4583	0.6188	0.2144	0.0000	0.0000	0.0000
			M	68.9387	9.3934	5.2139	0.5019	0.1370	0.0000	0.0000	0.0000
238	1.0	D	P	77.3731	6.8355	3.7701	0.3854	0.1104	0.0000	0.0000	0.0000
			K	77.5038	6.8738	3.8687	0.4439	0.1538	0.0000	0.0000	0.0000
			M	77.3717	6.8366	3.7893	0.4192	0.1396	0.0000	0.0000	0.0000
239	1.0	E	P	83.8243	4.7014	2.6238	0.3292	0.0797	0.0000	0.0000	0.0000
			K	83.9213	4.7108	2.6448	0.3551	0.1049	0.0000	0.0000	0.0000
			M	83.8112	4.6976	2.6219	0.3598	0.1129	0.0000	0.0000	0.0000
240	1.0	F	P	93.7491	1.3471	0.7108	0.2748	0.0330	0.0000	0.0000	0.0000
			K	93.7944	1.3473	0.7104	0.2742	0.0339	0.0000	0.0000	0.0000
			M	93.7321	1.3493	0.7183	0.3099	0.0481	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
241	1.5	A	P	58.5585	11.8496	4.9055	0.0455	0.0027	0.0000	0.0000	0.0000
			K	58.8579	12.1590	5.6682	0.1490	0.0131	0.0000	0.0000	0.0000
			M	58.5499	11.8326	4.8737	0.0596	0.0042	0.0000	0.0000	0.0000
242	1.5	B	P	63.4918	10.3581	4.3569	0.0537	0.0034	0.0000	0.0000	0.0000
			K	63.7627	10.5845	4.9631	0.1353	0.0114	0.0000	0.0000	0.0000
			M	63.4782	10.3567	4.4129	0.0679	0.0049	0.0000	0.0000	0.0000
243	1.5	C	P	68.4253	8.9166	3.9104	0.0539	0.0037	0.0000	0.0000	0.0000
			K	68.6675	9.0624	4.3081	0.1117	0.0098	0.0000	0.0000	0.0000
			M	68.4059	8.9081	3.9373	0.0679	0.0053	0.0000	0.0000	0.0000
244	1.5	D	P	76.8215	6.5087	2.8961	0.0451	0.0032	0.0000	0.0000	0.0000
			K	77.0057	6.5606	3.0534	0.0802	0.0070	0.0000	0.0000	0.0000
			M	76.8126	6.5079	2.9422	0.0711	0.0063	0.0000	0.0000	0.0000
245	1.5	E	P	83.2436	4.4823	2.0469	0.0496	0.0032	0.0000	0.0000	0.0000
			K	83.3820	4.4962	2.0874	0.0641	0.0048	0.0000	0.0000	0.0000
			M	83.2428	4.4861	2.0782	0.0724	0.0060	0.0000	0.0000	0.0000
246	1.5	F	P	93.1216	1.2835	0.5543	0.0432	0.0013	0.0000	0.0000	0.0000
			K	93.1916	1.2859	0.5607	0.0495	0.0015	0.0000	0.0000	0.0000
			M	93.1021	1.2893	0.5734	0.0681	0.0025	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
247	2.0	A	P	58.0861	11.1798	3.2028	0.0047	0.0002	0.0000	0.0000	0.0000
			K	58.4771	11.5787	4.1666	0.0185	0.0010	0.0000	0.0000	0.0000
			M	58.0774	11.1591	3.1069	0.0061	0.0003	0.0000	0.0000	0.0000
248	2.0	B	P	62.9389	9.7822	2.8355	0.0046	0.0002	0.0000	0.0000	0.0000
			K	63.3502	10.0793	3.6483	0.0168	0.0009	0.0000	0.0000	0.0000
			M	62.9563	9.7589	2.8991	0.0066	0.0003	0.0000	0.0000	0.0000
249	2.0	C	P	67.9110	8.4390	2.5820	0.0046	0.0002	0.0000	0.0000	0.0000
			K	68.2233	8.6299	3.1668	0.0139	0.0007	0.0000	0.0000	0.0000
			M	67.8554	8.4068	2.6438	0.0068	0.0003	0.0000	0.0000	0.0000
250	2.0	D	P	76.2748	6.1940	2.0629	0.0054	0.0003	0.0000	0.0000	0.0000
			K	76.5076	6.2475	2.2445	0.0100	0.0005	0.0000	0.0000	0.0000
			M	76.2339	6.1676	2.0758	0.0080	0.0004	0.0000	0.0000	0.0000
251	2.0	E	P	82.6574	4.2551	1.4432	0.0050	0.0002	0.0000	0.0000	0.0000
			K	82.8426	4.2816	1.5344	0.0080	0.0004	0.0000	0.0000	0.0000
			M	82.6232	4.2555	1.4907	0.0083	0.0004	0.0000	0.0000	0.0000
252	2.0	F	P	92.4945	1.2203	0.3993	0.0048	0.0001	0.0000	0.0000	0.0000
			K	92.5838	1.2245	0.4122	0.0061	0.0001	0.0000	0.0000	0.0000
			M	92.4557	1.2277	0.4256	0.0090	0.0001	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F.											
253	0.1	A	P	59.6636	13.3902	9.119	2.3164	3.7484	0.5704	0.2288	0.0010
			K	59.8413	13.6603	9.6428	2.7088	4.7507	1.3011	1.0303	0.0201
			M	59.6772	13.4094	9.1539	2.3288	3.7492	0.4630	0.1219	0.0002
254	0.1	B	P	64.6694	11.6966	8.0628	2.1544	3.3613	0.5669	0.2601	0.0014
			K	64.8280	11.8914	8.4433	2.4602	4.1503	1.1321	0.8945	0.0175
			M	64.6770	11.7055	8.0859	2.1726	3.4472	0.5154	0.1684	0.0004
255	0.1	C	P	69.6789	10.0485	7.0756	1.8397	3.0864	0.5818	0.2984	0.0019
			K	69.8148	10.1814	7.3289	2.0316	3.5574	0.9681	0.7699	0.0150
			M	69.6756	10.0450	7.0685	1.8330	3.0751	0.5273	0.2072	0.0006
256	0.1	D	P	78.1959	7.3095	5.0916	1.3807	2.4178	0.5481	0.3302	0.0036
			K	78.2923	7.3707	5.1944	1.4572	2.5517	0.6915	0.5472	0.0107
			M	78.2043	7.3147	5.1017	1.3869	2.4295	0.5512	0.3239	0.0025
257	0.1	E	P	84.7064	5.0236	3.5112	1.1327	1.7284	0.4459	0.3038	0.0070
			K	84.7751	5.0514	3.5511	1.1658	1.7412	0.4764	0.3699	0.0091
			M	84.7144	5.0267	3.5175	1.1366	1.7293	0.4385	0.2922	0.0053
258	0.1	F	P	94.7211	1.4418	0.9510	0.8940	0.5710	0.1479	0.1196	0.0055
			K	94.7487	1.4447	0.9539	0.9001	0.5793	0.1434	0.1169	0.0023
			M	94.7148	1.4410	0.9517	0.8958	0.5793	0.1477	0.1144	0.0031

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
259	0.2	A	F	59.4211	13.0252	8.3518	1.7470	2.0883	0.0430	0.0050	0.0000
			K	59.6325	13.4207	9.0755	2.2575	3.1728	0.2601	0.0643	0.0000
			M	59.4381	13.0460	8.3715	1.7134	1.8804	0.0171	0.0015	0.0000
260	0.2	B	F	64.4197	11.3944	7.4276	1.6674	2.0267	0.0536	0.0066	0.0000
			K	64.6561	11.6828	7.9467	2.0504	2.7718	0.2263	0.0558	0.0000
			M	64.4520	11.4308	7.4908	1.6712	2.0112	0.0336	0.0033	0.0000
261	0.2	C	F	69.4212	9.7998	6.5395	1.4406	1.9099	0.0649	0.0086	0.0000
			K	69.6296	10.0028	6.8978	1.6931	2.3759	0.1935	0.0481	0.0000
			M	69.4398	9.8161	6.5659	1.4427	1.8727	0.0420	0.0044	0.0000
262	0.2	D	F	77.9278	7.1418	4.7265	1.0933	1.5016	0.0810	0.0136	0.0000
			K	78.0847	7.2414	4.8889	1.2145	1.7042	0.1382	0.0342	0.0000
			M	77.9561	7.1591	4.7672	1.1241	1.6157	0.0764	0.0105	0.0000
263	0.2	E	F	84.4344	4.9158	3.2788	0.9185	1.1454	0.0781	0.0140	0.0000
			K	84.5503	4.9628	3.3422	0.9716	1.1629	0.0952	0.0231	0.0000
			M	84.4706	4.9299	3.3097	0.9458	1.2251	0.0929	0.0161	0.0000
264	0.2	F	F	94.4525	1.4144	0.8993	0.7601	0.4394	0.0493	0.0121	0.0000
			K	94.4974	1.4193	0,8977	0.7501	0.3759	0.0287	0.0073	0.0000
			M	94.4525	1.4144	0.8981	0.7541	0.4224	0.0390	0.0088	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
265	0.5	A	P	58.7618	12.0376	6.2843	0.4606	0.1085	0.0000	0.0000	0.0000
			K	59.2063	12.7017	7.3739	0.9266	0.1508	0.0002	0.0000	0.0000
			M	58.7636	12.0285	6.1812	0.2823	0.0275	0.0000	0.0000	0.0000
266	0.5	B	P	63.7328	10.5654	5.6730	0.4824	0.1175	0.0000	0.0000	0.0000
			K	64.1402	11.0569	6.4566	0.8416	0.1318	0.0002	0.0000	0.0000
			M	63.7722	10.6005	5.6929	0.3762	0.0470	0.0000	0.0000	0.0000
267	0.5	C	P	68.7105	9.1163	5.0661	0.4537	0.1216	0.0000	0.0000	0.0000
			K	69.0741	9.4669	5.6044	0.6949	0.1129	0.0001	0.0000	0.0000
			M	68.7206	9.1178	5.0330	0.3552	0.0521	0.0000	0.0000	0.0000
268	0.5	D	P	77.1822	6.6774	3.7455	0.3915	0.1090	0.0000	0.0000	0.0000
			K	77.4616	6.8534	3.9722	0.4985	0.0180	0.0001	0.0000	0.0000
			M	77.2008	6.6057	3.7496	0.3593	0.0779	0.0000	0.0000	0.0000
269	0.5	E	P	83.6647	4.6115	2.6191	0.3484	0.0849	0.0000	0.0000	0.0000
			K	83.8757	4.6969	2.7155	0.3988	0.0553	0.0000	0.0000	0.0000
			M	83.6696	4.6122	2.6284	0.3370	0.0779	0.0000	0.0000	0.0000
270	0.5	F	P	93.6489	1.3330	0.7320	0.3149	0.0299	0.0000	0.0000	0.0000
			K	93.7434	1.3433	0.7294	0.3079	0.0179	0.0000	0.0000	0.0000
			M	93.6592	1.3338	0.7358	0.3309	0.0475	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
271	0.8	A	P	58.1259	11.0879	4.3216	0.0289	0.0013	0.0000	0.0000	0.0000
			K	58.7302	11.9828	5.6729	0.1354	0.0031	0.0000	0.0000	0.0000
			M	58.1564	11.0980	4.1905	0.0182	0.0008	0.0000	0.0000	0.0000
272	0.8	B	P	63.0703	9.7684	3.9598	0.0302	0.0011	0.0000	0.0000	0.0000
			K	63.6243	10.4310	4.9673	0.1229	0.0028	0.0000	0.0000	0.0000
			M	63.0817	9.7572	3.8743	0.0229	0.0010	0.0000	0.0000	0.0000
273	0.8	C	P	68.0233	8.4573	3.6143	0.0305	0.0010	0.0000	0.0000	0.0000
			K	68.5185	8.9310	4.3116	0.1015	0.0024	0.0000	0.0000	0.0000
			M	68.0625	8.4788	3.6335	0.0311	0.0015	0.0000	0.0000	0.0000
274	0.8	D	P	76.4561	6.2261	2.7678	0.0318	0.0009	0.0000	0.0000	0.0000
			K	76.8386	6.4655	3.0559	0.0728	0.0017	0.0000	0.0000	0.0000
			M	76.4730	6.2295	2.7704	0.0372	0.0020	0.0000	0.0000	0.0000
275	0.8	E	P	82.9096	4.3135	1.9596	0.0367	0.0011	0.0000	0.0000	0.0000
			K	83.2011	4.4310	2.0891	0.0583	0.0012	0.0000	0.0000	0.0000
			M	82.9020	4.3077	1.9760	0.0407	0.0020	0.0000	0.0000	0.0000
276	0.8	F	P	92.8476	1.2522	0.5555	0.0382	0.0004	0.0000	0.0000	0.0000
			K	92.9894	1.2672	0.5612	0.0450	0.0004	0.0000	0.0000	0.0000
			M	92.8753	1.2543	0.5757	0.0586	0.0150	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
277	1.0	A	P	57.7059	10.4619	2.9212	0.0031	0.0001	0.0000	0.0000	0.0000
			K	58.4127	11.5034	4.5448	0.0274	0.0004	0.0000	0.0000	0.0000
			M	57.7252	10.4427	2.8551	0.0030	0.0001	0.0000	0.0000	0.0000
278	1.0	B	P	62.6310	9.2404	2.8078	0.0038	0.0001	0.0000	0.0000	0.0000
			K	63.2804	10.0138	3.9795	0.0249	0.0004	0.0000	0.0000	0.0000
			M	62.6793	9.2658	2.8480	0.0046	0.0002	0.0000	0.0000	0.0000
279	1.0	C	P	67.5674	8.0203	2.6529	0.0044	0.0001	0.0000	0.0000	0.0000
			K	68.1481	8.5738	3.4542	0.0206	0.0003	0.0000	0.0000	0.0000
			M	67.5858	8.0160	2.6427	0.0052	0.0002	0.0000	0.0000	0.0000
280	1.0	D	P	75.9754	5.9253	2.0603	0.0058	0.0001	0.0000	0.0000	0.0000
			K	76.4233	6.2069	2.4482	0.0147	0.0002	0.0000	0.0000	0.0000
			M	75.9763	5.9182	2.1107	0.0067	0.0002	0.0000	0.0000	0.0000
281	1.0	E	P	82.4085	4.1158	1.5002	0.0059	0.0001	0.0000	0.0000	0.0000
			K	82.7513	4.2538	1.6737	0.0118	0.0002	0.0000	0.0000	0.0000
			M	82.3896	4.1044	1.5444	0.0078	0.0003	0.0000	0.0000	0.0000
282	1.0	F	P	92.3136	1.1985	0.4358	0.0069	0.0000	0.0000	0.0000	0.0000
			K	92.4868	1.2166	0.4496	0.0091	0.0000	0.0000	0.0000	0.0000
			M	92.3062	1.1965	0.4599	0.0115	0.0002	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
283	1.5	A	P	56.6329	8.8475	0.5425	0.0001	0.0000	0.0000	0.0000	0.0000
			K	57.6190	10.3052	1.9662	0.0008	0.0000	0.0000	0.0000	0.0000
			M	56.6389	8.7918	0.6228	0.0001	0.0000	0.0000	0.0000	0.0000
284	1.5	B	P	61.5169	7.8946	0.6913	0.0001	0.0000	0.0000	0.0000	0.0000
			K	62.4206	8.9707	1.7217	0.0001	0.0000	0.0000	0.0000	0.0000
			M	61.5196	7.8496	0.6995	0.0001	0.0000	0.0000	0.0000	0.0000
285	1.5	C	P	66.4167	6.9131	0.7326	0.0001	0.0000	0.0000	0.0000	0.0000
			K	67.2222	7.6807	1.4944	0.0006	0.0000	0.0000	0.0000	0.0000
			M	66.4271	6.8909	0.7733	0.0001	0.0000	0.0000	0.0000	0.0000
286	1.5	D	P	74.7665	5.1716	0.6230	0.0001	0.0000	0.0000	0.0000	0.0000
			K	75.3849	5.5603	1.0592	0.0004	0.0000	0.0000	0.0000	0.0000
			M	74.7488	5.1488	0.7367	0.0002	0.0000	0.0000	0.0000	0.0000
287	1.5	E	P	81.1601	3.6216	0.5470	0.0002	0.0000	0.0000	0.0000	0.0000
			K	81.6270	3.8107	0.7241	0.0004	0.0000	0.0000	0.0000	0.0000
			M	81.0992	3.5925	0.5915	0.0002	0.0000	0.0000	0.0000	0.0000
288	1.5	F	P	90.9771	1.0642	0.1675	0.0002	0.0000	0.0000	0.0000	0.0000
			K	91.2302	1.0898	0.1945	0.0003	0.0000	0.0000	0.0000	0.0000
			M	90.9367	1.0575	0.2029	0.0003	0.0000	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
289	2.0	A	P	55.5220	7.1470	0.0565	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.8254	9.1070	0.5188	0.0000	0.0000	0.0000	0.0000	0.0000
			M	55.5685	7.1673	0.0925	0.0000	0.0000	0.0000	0.0000	0.0000
290	2.0	B	P	60.3709	6.4852	0.0718	0.0000	0.0000	0.0000	0.0000	0.0000
			K	61.5608	7.9277	0.4542	0.0000	0.0000	0.0000	0.0000	0.0000
			M	60.3534	6.4269	0.1043	0.0000	0.0000	0.0000	0.0000	0.0000
291	2.0	C	P	65.2378	5.7629	0.0834	0.0000	0.0000	0.0000	0.0000	0.0000
			K	66.2963	6.7876	0.3943	0.0000	0.0000	0.0000	0.0000	0.0000
			M	65.2348	5.7341	0.1308	0.0000	0.0000	0.0000	0.0000	0.0000
292	2.0	D	P	73.5350	4.3989	0.0983	0.0000	0.0000	0.0000	0.0000	0.0000
			K	74.3466	4.9138	0.2795	0.0000	0.0000	0.0000	0.0000	0.0000
			M	73.5536	4.3999	0.1603	0.0000	0.0000	0.0000	0.0000	0.0000
293	2.0	E	P	79.8803	3.1162	0.0980	0.0000	0.0000	0.0000	0.0000	0.0000
			K	80.5026	3.3676	0.1910	0.0000	0.0000	0.0000	0.0000	0.0000
			M	79.8737	3.1064	0.1464	0.0000	0.0000	0.0000	0.0000	0.0000
294	2.0	F	P	89.6409	0.9295	0.0373	0.0000	0.0000	0.0000	0.0000	0.0000
			K	89.9735	0.9631	0.0513	0.0000	0.0000	0.0000	0.0000	0.0000
			M	89.6367	0.9256	0.0589	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F.											
295	0.1	A	P	56.8071	10.7131	4.7173	0.3250	0.0992	0.0007	0.0000	0.0000
			K	59.2532	13.0421	8.3021	1.9100	2.5831	0.2081	0.0188	0.0000
			M	57.2312	10.9271	4.2319	0.0437	0.0035	0.0000	0.0000	0.0000
296	0.1	B	P	62.0260	9.6722	4.5843	0.4015	0.1440	0.0012	0.0000	0.0000
			K	64.1910	11.3532	7.2694	1.7347	2.2566	0.1811	0.0163	0.0000
			M	62.3233	9.7906	4.2631	0.0895	0.0083	0.0000	0.0000	0.0000
297	0.1	C	P	67.3058	8.5867	4.4565	0.5373	0.4360	0.0149	0.0016	0.0000
			K	69.1287	9.7206	6.3099	1.4325	1.9342	0.1548	0.0141	0.0000
			M	67.4702	8.6247	4.1953	0.1644	0.0217	0.0001	0.0000	0.0000
298	0.1	D	P	76.2049	6.9054	3.6042	0.5369	0.5021	0.0228	0.0023	0.0000
			K	77.5229	7.0371	4.4722	1.0275	1.3874	0.1106	0.0100	0.0000
			M	76.1995	6.4813	3.4509	0.3016	0.0783	0.0004	0.0000	0.0000
299	0.1	E	P	82.9824	4.5810	2.6714	0.5325	0.4731	0.0264	0.0024	0.0000
			K	83.9420	4.8227	3.0574	0.8220	0.9467	0.0762	0.0068	0.0000
			M	82.9916	4.5771	2.6305	0.4310	0.2000	0.0019	0.0000	0.0000
300	0.1	F	P	93.3184	1.3496	0.7834	0.5208	0.2165	0.0363	0.0010	0.0000
			K	93.8176	1.3793	0.8213	0.6347	0.3061	0.0655	0.0021	0.0000
			M	93.2911	1.3474	0.7790	0.5002	0.1832	0.0148	0.0002	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
301	0.2	A	P	55.3865	9.3470	2.5724	0.0143	0.0010	0.0000	0.0000	0.0000
			K	58.5064	12.1841	6.3944	0.7142	0.2123	0.0010	0.0000	0.0000
			M	55.9629	9.5653	1.7990	0.0019	0.0001	0.0000	0.0000	0.0000
302	0.2	B	P	60.5906	8.5381	2.7054	0.0246	0.0019	0.0000	0.0000	0.0000
			K	63.3819	10.6063	5.5990	0.6487	0.1855	0.0009	0.0000	0.0000
			M	61.2485	8.8633	2.4618	0.0065	0.0004	0.0000	0.0000	0.0000
303	0.2	C	P	65.8063	7.6245	2.7454	0.0362	0.0032	0.0000	0.0000	0.0000
			K	68.2575	9.0811	4.8599	0.5357	0.1590	0.0008	0.0000	0.0000
			M	65.8625	7.5219	2.0157	0.0043	0.0003	0.0000	0.0000	0.0000
304	0.2	D	P	74.6895	5.8611	2.4198	0.0626	0.0070	0.0000	0.0000	0.0000
			K	76.5459	6.5742	3.4446	0.3842	0.1140	0.0005	0.0000	0.0000
			M	74.8510	5.8842	2.2566	0.0222	0.0018	0.0000	0.0000	0.0000
305	0.2	E	P	81.4700	4.1676	1.8822	0.0908	0.0119	0.0000	0.0000	0.0000
			K	82.8841	4.5055	2.3548	0.3074	0.0778	0.0004	0.0000	0.0000
			M	81.6226	4.1934	1.8616	0.0536	0.0048	0.0000	0.0000	0.0000
306	0.2	F	P	91.8399	1.2434	0.5846	0.1487	0.0131	0.0002	0.0000	0.0000
			K	92.6351	1.2885	0.6325	0.2373	0.0252	0.0003	0.0000	0.0000
			M	92.0429	1.2579	0.6103	0.1485	0.0111	0.0001	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i-C_4H_{10}$	C_4H_{10}	$i-C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
307	0.5	A	P	51.4045	5.5706	0.0356	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.2660	9.6103	1.2740	0.0017	0.0001	0.0000	0.0000	0.0000
			M	51.6444	4.9686	0.0147	0.0000	0.0000	0.0000	0.0000	0.0000
308	0.5	B	P	56.5391	5.3565	0.0792	0.0000	0.0000	0.0000	0.0000	0.0000
			K	60.9548	8.3658	1.1155	0.0015	0.0000	0.0000	0.0000	0.0000
			M	56.7713	5.0146	0.0292	0.0000	0.0000	0.0000	0.0000	0.0000
309	0.5	C	P	61.6970	5.0068	0.1173	0.0000	0.0000	0.0000	0.0000	0.0000
			K	65.6437	7.1628	0.9683	0.0013	0.0000	0.0000	0.0000	0.0000
			M	61.7452	4.7038	0.0456	0.0000	0.0000	0.0000	0.0000	0.0000
310	0.5	D	P	70.5118	4.0824	0.1497	0.0000	0.0000	0.0000	0.0000	0.0000
			K	73.6147	5.1854	0.6863	0.0009	0.0000	0.0000	0.0000	0.0000
			M	70.5623	3.9860	0.1058	0.0000	0.0000	0.0000	0.0000	0.0000
311	0.5	E	P	77.2518	3.0131	0.1590	0.0001	0.0000	0.0000	0.0000	0.0000
			K	79.7102	3.5537	0.4692	0.0007	0.0000	0.0000	0.0000	0.0000
			M	77.3152	2.9864	0.1549	0.0001	0.0000	0.0000	0.0000	0.0000
312	0.5	F	P	87.5882	0.9364	0.0796	0.0001	0.0000	0.0000	0.0000	0.0000
			K	89.0878	1.0163	0.1260	0.0006	0.0000	0.0000	0.0000	0.0000
			M	87.5715	0.9373	0.0945	0.0001	0.0000	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
313	0.8	A	P	47.5371	2.0016	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
			K	54.0256	7.0394	0.0614	0.0000	0.0000	0.0000	0.0000	0.0000
			M	47.8253	1.6858	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
314	0.8	B	P	52.6123	2.3035	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000
			K	58.5277	6.1278	0.0537	0.0000	0.0000	0.0000	0.0000	0.0000
			M	52.9481	2.0978	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
315	0.8	C	P	57.7172	2.4562	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.0299	5.2466	0.0467	0.0000	0.0000	0.0000	0.0000	0.0000
			M	57.8123	2.2086	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000
316	0.8	D	P	66.4418	2.4184	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000
			K	70.6835	3.7982	0.0331	0.0000	0.0000	0.0000	0.0000	0.0000
			M	66.6982	2.3176	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000
317	0.8	E	P	73.1264	1.8975	0.0047	0.0000	0.0000	0.0000	0.0000	0.0000
			K	76.5363	2.6031	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000
			M	73.3294	1.8822	0.0061	0.0000	0.0000	0.0000	0.0000	0.0000
318	0.8	F	P	83.3925	0.6369	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000
			K	85.5405	0.7445	0.0061	0.0000	0.0000	0.0000	0.0000	0.0000
			M	83.4632	0.6438	0.0047	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
319	1.0	A	P	44.8524	0.6842	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.5320	5.3470	0.0092	0.0000	0.0000	0.0000	0.0000	0.0000
			M	44.9668	0.5364	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
320	1.0	B	P	49.9299	0.9608	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.9057	4.6546	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000
			M	50.0464	0.7020	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
321	1.0	C	P	55.0294	1.1871	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
			K	61.2873	3.9852	0.0070	0.0000	0.0000	0.0000	0.0000	0.0000
			M	55.1957	1.0391	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
322	1.0	D	P	63.7278	1.3369	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
			K	68.7294	2.6851	0.0049	0.0000	0.0000	0.0000	0.0000	0.0000
			M	63.7959	1.2535	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
323	1.0	E	P	70.3720	1.1619	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
			K	74.4203	1.9772	0.0034	0.0000	0.0000	0.0000	0.0000	0.0000
			M	70.5055	1.1652	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
324	1.0	F	P	80.5684	0.4296	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
			K	83.1757	0.5655	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
			M	80.4333	0.4355	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
325	1.5	A	P	37.8492	0.0201	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	48.7980	1.8035	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
			M	37.7850	0.0263	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
326	1.5	B	P	42.9345	0.0371	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.8645	1.5700	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
			M	42.9762	0.0485	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
327	1.5	C	P	48.0791	0.0631	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.9310	1.3442	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
			M	47.9969	0.0767	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
328	1.5	D	P	56.7888	0.1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.8441	0.9731	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.5043	0.1339	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
329	1.5	E	P	63.3929	0.1434	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	69.1305	0.6669	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
			M	63.3882	0.1803	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
330	1.5	F	P	73.5421	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	77.2635	0.1907	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	74.0561	0.1197	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE IV (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
331	2.0	A	P	30.7781	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	45.0640	0.3564	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	30.7021	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
332	2.0	B	P	35.8968	0.0024	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	48.8194	0.3102	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	35.8307	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
333	2.0	C	P	41.0218	0.0044	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.5747	0.2656	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	41.0424	0.0074	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
334	2.0	D	P	49.7563	0.0098	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	58.9587	0.1923	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	49.7347	0.0155	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
335	2.0	E	P	56.4103	0.0142	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.8407	0.1318	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.4368	0.0221	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
336	2.0	F	P	66.4010	0.0101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			K	71.3514	0.0377	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			M	66.3754	0.0152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE V

COMPOSITION OF EFFLUENT GAS (Y_N): 5-PLATE COLUMN

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F.											
337	0.1	A	P	59.9715	13.8516	10.0912	3.0545	6.0376	2.2505	2.3281	0.7554
			K	59.9755	13.8552	10.0966	3.0597	6.0487	2.2578	2.3344	0.7543
			M	59.9717	13.8523	10.0932	3.0561	6.0418	2.2531	2.3303	0.7492
338	0.1	B	P	64.9697	12.0583	8.8368	2.7748	5.2763	1.9591	2.0222	0.6557
			K	64.9735	12.0610	8.8407	2.7789	5.2842	1.9644	2.0266	0.6542
			M	64.9705	12.0599	8.8416	2.7792	5.2876	1.9697	2.0359	0.6619
339	0.1	C	P	69.9680	10.3248	7.6713	2.2921	4.5246	1.6769	1.7424	0.5631
			K	69.9714	10.3266	7.6738	2.2948	4.5293	1.6800	1.7444	0.5607
			M	69.9689	10.3265	7.6764	2.2966	4.5367	1.6889	1.7586	0.5732
340	0.1	D	P	78.4652	7.4750	5.4382	1.6451	3.2478	1.1996	1.2409	0.4037
			K	78.4680	7.4758	5.4389	1.6460	3.2489	1.2000	1.2399	0.4005
			M	78.4657	7.4761	5.4417	1.6482	3.2565	1.2086	1.2531	0.4123
341	0.1	E	P	84.9631	5.1231	3.7181	1.3165	2.2171	0.8271	0.8395	0.3437
			K	84.9653	5.1234	3.7182	1.3168	2.2169	0.8267	0.8380	0.3405
			M	84.9615	5.1230	3.7186	1.3170	2.2184	0.8289	0.8419	0.3446
342	0.1	F	P	94.9603	1.4652	0.9983	1.0166	0.7167	0.2489	0.2653	0.0871
			K	94.9612	1.4653	0.9988	1.0167	0.7167	0.2489	0.2651	0.0868
			M	94.9544	1.4648	0.9982	1.0148	0.7152	0.2477	0.2637	0.0853

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
343	0.2	A	P	59.9445	13.8104	9.9975	2.9736	5.8104	2.0424	2.0410	0.5065
			K	59.9510	13.8103	9.9831	2.9538	5.7673	1.9757	1.9399	0.4129
			M	59.9465	13.8097	9.9891	2.9635	5.7848	1.9975	1.9746	0.4374
344	0.2	B	P	64.9407	12.0224	8.7538	2.7001	5.0750	1.7731	1.7662	0.4332
			K	64.9469	12.0219	8.7413	2.6878	5.0384	1.7191	1.6841	0.3581
			M	69.9434	12.0232	8.7510	2.6956	5.0645	1.7486	1.7290	0.3908
345	0.2	C	P	69.9370	10.2939	7.5979	2.2289	4.3484	1.5121	1.5142	0.3651
			K	69.9429	10.2932	7.5876	2.2195	4.3187	1.4701	1.4496	0.3069
			M	69.9399	10.2951	7.5981	2.2279	4.3464	1.5008	1.4956	0.3408
346	0.2	D	P	78.4311	7.4524	5.3844	1.5977	3.1167	1.0744	1.0680	0.2525
			K	78.4359	7.4516	5.3778	1.5921	3.0978	1.0501	1.0303	0.2192
			M	78.4333	7.4535	5.3865	1.5991	3.1207	1.0749	1.0672	0.2468
347	0.2	E	P	84.9267	5.1074	3.6805	1.2774	2.1251	0.7371	0.7173	0.2091
			K	84.9306	5.1068	3.6764	1.2737	2.1138	0.7234	0.6964	0.1863
			M	84.9264	5.1075	3.6808	1.2777	2.1257	0.7368	0.7163	0.2047
348	0.2	F	P	94.9207	1.4606	0.9880	0.9842	0.6847	0.2191	0.2225	0.0494
			K	94.9224	1.4605	0.9876	0.9833	0.6833	0.2178	0.2203	0.0475
			M	94.9148	1.4604	0.9880	0.9843	0.6849	0.2197	0.2236	0.0498

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
349	0.5	A	P	59.8639	13.6868	9.7156	2.7314	5.1258	1.4119	1.1852	0.0754
			K	59.8776	13.6758	9.6428	2.6585	4.9239	1.1630	0.8791	0.0369
			M	59.8686	13.6780	9.6671	2.6772	4.9907	1.2301	0.9677	0.0459
350	0.5	B	P	64.8541	11.9141	8.5022	2.4739	4.4629	1.2044	0.9986	0.0600
			K	64.8673	11.9048	8.4433	2.4145	4.3016	1.0119	0.7632	0.0320
			M	64.8578	11.9069	8.4651	2.4319	4.3609	1.0729	0.8412	0.0400
351	0.5	C	P	69.8445	10.2005	7.3755	2.0371	3.8118	1.0084	0.8324	0.0471
			K	69.8571	10.1929	7.3289	1.9939	3.6871	0.8654	0.6569	0.0274
			M	69.8475	10.1954	7.3494	2.0096	3.7420	0.9211	0.7283	0.0348
352	0.5	D	P	78.3290	7.3837	5.2203	1.4528	2.7140	0.6908	0.5557	0.0287
			K	78.3398	7.3790	5.1944	1.4302	2.6448	0.6181	0.4669	0.0196
			M	78.3260	7.3787	5.2038	1.4369	2.6715	0.6467	0.5044	0.0233
353	0.5	E	P	84.8176	5.0597	3.5648	1.1572	1.8410	0.4610	0.3578	0.0217
			K	84.8265	5.0571	3.5511	1.1441	1.8047	0.4258	0.3156	0.0166
			M	84.8177	5.0596	3.5642	1.1565	1.8393	0.4603	0.3580	0.0223
354	0.5	F	P	94.8020	1.4465	0.9550	0.8859	0.5871	0.1309	0.1033	0.0046
			K	94.8061	1.4463	0.9539	0.8833	0.5834	0.1282	0.0998	0.0042
			M	94.7944	1.4467	0.9569	0.8914	0.5931	0.1373	0.1118	0.0055

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
355	0.8	A	P	59.7769	13.5227	9.2846	2.3312	4.0274	0.5181	0.2798	0.0046
			K	59.8041	13.5413	9.3024	2.3581	4.0876	0.5568	0.3046	0.0053
			M	59.7753	13.5203	9.2815	2.3348	4.0474	0.5445	0.3006	0.0050
356	0.8	B	P	64.7624	11.7773	8.1443	2.1311	3.5530	0.4549	0.2421	0.0038
			K	64.7878	11.7877	8.1453	2.1417	3.5710	0.4845	0.2644	0.0046
			M	64.7607	11.7751	8.1408	2.1333	3.5693	0.4917	0.2744	0.0047
357	0.8	C	P	69.7485	10.0884	7.0817	1.7716	3.0796	0.4106	0.2246	0.0037
			K	69.7714	10.0926	7.0702	1.7686	3.0609	0.4143	0.2276	0.0039
			M	69.7451	10.0848	7.0736	1.7680	3.0769	0.4301	0.2434	0.0042
358	0.8	D	P	78.2269	7.3130	5.0480	1.2987	2.2866	0.3470	0.2016	0.0037
			K	78.2437	7.3065	5.0111	1.2686	2.1955	0.2959	0.1618	0.0028
			M	78.2299	7.3118	5.0405	1.2921	2.2724	0.3450	0.2028	0.0039
359	0.8	E	P	84.7086	5.0108	3.4444	1.0312	1.5432	0.2263	0.1265	0.0028
			K	84.7725	5.0074	3.4258	1.0149	1.4981	0.2039	0.1093	0.0024
			M	84.7067	5.0106	3.4449	1.0326	1.5483	0.2363	0.1359	0.0032
360	0.8	F	P	94.6334	1.4324	0.9217	0.7864	0.4887	0.0629	0.0359	0.0006
			K	94.6898	1.4321	0.9202	0.7836	0.4843	0.0614	0.0346	0.0006
			M	94.6756	1.4334	0.9262	0.7999	0.5031	0.0726	0.0442	0.0009

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
361	1.0	A	P	59.7220	13.4297	9.0544	2.1222	3.4551	0.2824	0.1285	0.0016
			K	59.7551	13.4516	9.0756	2.1591	3.5440	0.3200	0.1484	0.0019
			M	59.7197	13.4264	9.0517	2.1323	3.5010	0.3127	0.1472	0.0018
362	1.0	B	P	64.7039	11.6975	7.9463	1.9444	3.0584	0.2485	0.1116	0.0013
			K	64.7347	11.7097	7.9467	1.9609	3.0961	0.2784	0.1288	0.0017
			M	64.7007	11.6935	7.9402	1.9497	3.0920	0.2832	0.1343	0.0017
363	1.0	C	P	69.6863	10.0212	6.9129	1.6209	2.6657	0.2288	0.1055	0.0013
			K	69.7143	10.0258	6.8978	1.6193	2.6538	0.2381	0.1109	0.0014
			M	69.6836	10.0185	6.9083	1.6239	2.6876	0.2550	0.1233	0.0016
364	1.0	D	P	78.1586	7.2649	4.9290	1.1915	1.9926	0.1966	0.0948	0.0012
			K	78.1796	7.2581	4.8889	1.1615	1.9036	0.1701	0.0788	0.0010
			M	78.1645	7.2662	4.9292	1.1938	2.0053	0.2113	0.1057	0.0014
365	1.0	E	P	84.6358	4.9777	3.3621	0.9448	1.3418	0.1282	0.0599	0.0010
			K	84.6531	4.9742	3.3422	0.9292	1.2989	0.1172	0.0533	0.0009
			M	84.6295	4.9766	3.3620	0.9470	1.3499	0.1383	0.0669	0.0011
366	1.0	F	P	94.6043	1.4229	0.8993	0.7200	0.4240	0.0359	0.0173	0.0002
			K	94.6122	1.4226	0.8978	0.7174	0.4199	0.0353	0.0169	0.0002
			M	94.5943	1.4242	0.9052	0.7375	0.4425	0.0439	0.0226	0.0003

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs; 75°F. (continued)											
367	1.5	A	P	59.5845	13.1965	8.4749	1.6025	2.1336	0.0611	0.0220	0.0002
			K	59.6327	13.2274	8.5085	1.6749	2.3131	0.0828	0.0307	0.0003
			M	59.5774	13.1858	8.4636	1.6294	2.2429	0.0787	0.0297	0.0002
368	1.5	B	P	64.5572	11.4981	7.4496	1.4857	1.9372	0.0592	0.0215	0.0002
			K	64.6020	11.5145	7.4501	1.5212	2.0207	0.0721	0.0266	0.0003
			M	64.5503	11.4893	7.4380	1.5031	2.0111	0.0733	0.0277	0.0003
369	1.5	C	P	69.5326	9.8642	6.5311	1.2876	1.8067	0.0647	0.0243	0.0002
			K	69.5714	9.8587	6.4668	1.2561	1.7321	0.0616	0.0229	0.0002
			M	69.5381	9.8614	6.5167	1.2909	1.8406	0.0748	0.0291	0.0002
370	1.5	D	P	77.9869	7.1402	4.6157	0.9138	1.2784	0.0448	0.0167	0.0002
			K	78.0194	7.1371	4.5834	0.9010	1.2424	0.0440	0.0163	0.0002
			M	77.9730	7.1327	4.6033	0.9130	1.2895	0.0501	0.0193	0.0002
371	1.5	E	P	84.4533	4.8926	3.1478	0.7254	0.8621	0.0302	0.0110	0.0001
			K	84.4796	4.8913	3.1334	0.7208	0.8477	0.0303	0.0110	0.0001
			M	84.4304	4.8887	3.1481	0.7315	0.8821	0.0347	0.0131	0.0001
372	1.5	F	P	94.4065	1.3989	0.8428	0.5564	0.2751	0.0090	0.0034	0.0000
			K	94.4184	1.3988	0.8417	0.5565	0.2741	0.0091	0.0035	0.0000
			M	94.3808	1.4001	0.8501	0.5775	0.2959	0.0116	0.0046	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
a) 14.7 lb./sq.in.abs.; 75°F. (continued)											
373	2.0	A	P	59.4453	12.9596	7.8791	1.1274	1.1923	0.0182	0.0061	0.0000
			K	59.5102	13.0032	7.9420	1.2346	1.3880	0.0260	0.0088	0.0000
			M	59.4227	12.9244	7.8255	1.1427	1.2546	0.0221	0.0075	0.0000
374	2.0	B	P	64.4091	11.2958	6.9396	1.0546	1.0889	0.0170	0.0057	0.0000
			K	64.4694	11.3194	6.9541	1.1213	1.2126	0.0226	0.0076	0.0000
			M	64.3931	11.2759	6.9137	1.0825	1.1724	0.0219	0.0075	0.0000
375	2.0	C	P	69.3754	9.6927	6.0931	0.9285	1.0410	0.0181	0.0062	0.0000
			K	69.4286	9.6916	6.0363	0.9260	1.0393	0.0193	0.0065	0.0000
			M	69.3601	9.6692	6.0380	0.9200	1.0524	0.0205	0.0071	0.0000
376	2.0	D	P	77.8149	7.0169	4.3061	0.6621	0.7443	0.0130	0.0044	0.0000
			K	77.8592	7.0161	4.2783	0.6642	0.7455	0.0138	0.0047	0.0000
			M	77.8020	7.0135	4.3127	0.6840	0.8000	0.0164	0.0057	0.0000
377	2.0	E	P	84.2706	4.8084	2.9365	0.5275	0.5056	0.0089	0.0030	0.0000
			K	84.3061	4.8084	2.9248	0.5314	0.5087	0.0095	0.0031	0.0000
			M	84.2424	4.8058	2.9464	0.5456	0.5433	0.0112	0.0038	0.0000
378	2.0	F	P	94.2085	1.3750	0.7864	0.4079	0.1636	0.0028	0.0010	0.0000
			K	94.2245	1.3752	0.7856	0.4102	0.1645	0.0029	0.0010	0.0000
			M	94.1735	1.3767	0.7967	0.4342	0.1845	0.0037	0.0013	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs; 90°F.											
379	0.1	A	P	59.8861	13.7377	9.7914	2.8418	5.3767	1.5720	1.4788	0.2001
			K	59.9239	13.7839	9.9072	2.9230	5.6132	1.7745	1.7355	0.3166
			M	59.8965	13.7524	9.8289	2.8693	5.4565	1.6443	1.5629	0.2297
380	0.1	B	P	64.8839	11.9671	8.5952	2.5982	4.7472	1.4231	1.3515	0.2062
			K	64.9175	11.9990	8.6748	2.6548	4.9037	1.5440	1.5067	0.2746
			M	64.8931	11.9775	8.6217	2.6182	4.8022	1.4662	1.4021	0.2209
381	0.1	C	P	69.8819	10.2525	7.4772	2.1580	4.1063	1.2558	1.2138	0.2040
			K	69.9112	10.2735	7.5298	2.1923	4.2032	1.3204	1.2969	0.2354
			M	69.8915	10.2611	7.4996	2.1740	4.1520	1.2900	1.2535	0.2137
382	0.1	D	P	78.3807	7.4309	5.3229	1.5672	3.0055	0.9639	0.9504	0.2051
			K	78.4004	7.4374	5.3369	1.5725	3.0150	0.9431	0.9217	0.1681
			M	78.3851	7.4324	5.3257	1.5672	3.0019	0.9452	0.9217	0.1701
383	0.1	E	P	84.8764	5.0940	3.6420	1.2553	2.0533	0.6629	0.6405	0.1700
			K	84.8921	5.0971	3.6485	1.2580	2.0573	0.6497	0.6230	0.1429
			M	84.8690	5.0913	3.6346	1.2482	2.0339	0.6365	0.6044	0.1313
384	0.1	F	P	94.8725	1.4573	0.9792	0.9696	0.6634	0.1961	0.1978	0.0384
			K	94.8794	1.4577	0.9804	0.9713	0.6651	0.1956	0.1971	0.0364
			M	94.8609	1.4565	0.9780	0.9580	0.6621	0.1960	0.1970	0.0368

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TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.				(continued)							
385	0.2	A	P	59.7822	13.5893	9.4059	2.5447	4.4860	0.8196	0.6302	0.0303
			K	59.8477	13.6679	9.6043	2.6861	4.8969	1.0576	0.8654	0.0459
			M	59.7807	13.5373	9.4024	2.5441	4.4816	0.7724	0.5634	0.0200
386	0.2	B	P	64.7755	11.8428	8.2711	2.3399	4.0019	0.7695	0.6011	0.0306
			K	64.8350	11.8979	8.4097	2.4396	4.2781	0.9202	0.7513	0.0398
			M	64.7721	11.8390	8.2618	2.3345	3.9810	0.7200	0.5357	0.0204
387	0.2	C	P	69.7696	10.1501	7.2072	1.9538	3.4947	0.7039	0.5626	0.0301
			K	69.8223	10.1870	7.2997	2.0146	3.6669	0.7870	0.6467	0.0341
			M	69.7726	10.1529	7.2144	1.9594	3.5091	0.6908	0.5375	0.0236
388	0.2	D	P	78.2610	7.3595	5.1379	1.4245	2.5742	0.5357	0.4257	0.0207
			K	78.3008	7.3748	5.1737	1.4450	2.6303	0.5621	0.4597	0.0244
			M	78.2623	7.3602	5.1396	1.4255	2.5768	0.5424	0.4341	0.0220
389	0.2	E	P	84.7550	5.0489	3.5258	1.1517	1.7881	0.4007	0.3224	0.0229
			K	84.7843	5.0542	3.5370	1.1560	1.7948	0.3872	0.3107	0.0207
			M	84.7572	5.0497	3.5276	1.1528	1.7901	0.4012	0.3231	0.0232
390	0.2	F	P	94.7475	1.4455	0.9506	0.8965	0.5854	0.1264	0.1092	0.0070
			K	94.7589	1.4455	0.9501	0.8925	0.5802	0.1166	0.0983	0.0053
			M	94.7395	1.4452	0.9501	0.8965	0.5855	0.1265	0.1088	0.0068

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.				(continued)							
391	0.5	A	P	59.4942	13.1803	8.3598	1.7726	2.3434	0.0830	0.0414	0.0006
			K	59.6193	13.3197	8.6959	1.9807	2.8393	0.1195	0.0621	0.0009
			M	59.5173	13.2118	8.4325	1.8152	2.4281	0.0859	0.0423	0.0006
392	0.5	B	P	64.4727	11.4968	7.3790	1.6523	2.1449	0.0811	0.0406	0.0006
			K	64.5876	11.5948	7.6142	1.7989	2.4805	0.1040	0.0539	0.0008
			M	64.4823	11.5069	7.3994	1.6606	2.1502	0.0777	0.0383	0.0006
393	0.5	C	P	69.4538	9.8613	6.4408	1.3845	1.8998	0.0799	0.0412	0.0006
			K	69.5558	9.9275	6.6092	1.4855	2.1261	0.0889	0.0464	0.0007
			M	69.4618	9.8697	6.4689	1.4047	1.9285	0.0757	0.0381	0.0006
394	0.5	D	P	77.9241	7.1610	4.6240	1.0357	1.4633	0.0667	0.0344	0.0005
			K	78.0019	7.1869	4.6844	1.0655	1.5251	0.0635	0.0329	0.0005
			M	77.9275	7.1634	4.6320	1.0423	1.4743	0.0655	0.0334	0.0005
395	0.5	E	P	84.4029	4.9175	3.1862	0.8458	1.0246	0.0446	0.0224	0.0004
			K	84.4607	4.9254	3.2024	0.8524	1.0406	0.0438	0.0223	0.0004
			M	84.3998	4.9166	31.855	0.8502	1.0431	0.0505	0.0256	0.0004
396	0.5	F	P	94.3731	1.4090	0.8619	0.6669	0.3449	0.0150	0.0080	0.0001
			K	94.3972	1.4086	0.8602	0.6581	0.3364	0.0131	0.0070	0.0001
			M	94.3766	1.4106	0.8665	0.6837	0.3638	0.0195	0.0107	0.0001

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.				(continued)							
397	0.8	A	P	59.2134	12.7811	7.3371	1.0915	0.9565	0.0117	0.0052	0.0001
			K	59.3909	12.9715	7.7887	1.3261	1.3314	0.0182	0.0084	0.0001
			M	59.2228	12.7920	7.3516	1.0960	0.9632	0.0119	0.0053	0.0001
398	0.8	B	P	64.1771	11.1590	6.5063	1.0379	0.9024	0.0115	0.0051	0.0001
			K	64.3401	11.2917	6.8198	1.2044	1.1631	0.0158	0.0073	0.0001
			M	64.1789	11.1594	6.4990	1.0331	0.8975	0.0116	0.0051	0.0001
399	0.8	C	P	69.1451	9.5781	5.6874	0.8742	0.8071	0.0107	0.0048	0.0001
			K	69.2893	9.6680	5.9197	0.9945	0.9969	0.0135	0.0063	0.0001
			M	69.1414	9.5780	5.7022	0.8892	0.8276	0.0113	0.0050	0.0001
400	0.8	D	P	77.5929	6.9654	4.1159	0.6762	0.6538	0.0092	0.0041	0.0001
			K	77.7030	6.9990	4.1957	0.7134	0.7151	0.0097	0.0045	0.0001
			M	77.5898	6.9647	4.1206	0.6868	0.6776	0.0103	0.0046	0.0001
401	0.8	E	P	84.0555	4.7877	2.8488	0.5576	0.4601	0.0061	0.0027	0.0000
			K	84.1371	4.7967	2.8683	0.5707	0.4880	0.0067	0.0030	0.0000
			M	84.0454	4.7848	2.8468	0.5717	0.4969	0.0081	0.0036	0.0000
402	0.8	F	P	93.9993	1.3719	0.8410	0.4451	0.1598	0.0021	0.0010	0.0000
			K	94.0355	1.3718	0.7705	0.4406	0.1577	0.0020	0.0009	0.0000
			M	93.9804	1.3729	0.7756	0.4653	0.1769	0.0029	0.0014	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
403	1.0	A	P	59.0263	12.5150	6.6500	0.7140	0.4622	0.0035	0.0015	0.0000
			K	59.2386	12.7394	7.1865	0.9613	0.7558	0.0069	0.0030	0.0000
			M	59.0362	12.5260	6.6726	0.7488	0.5149	0.0045	0.0019	0.0000
404	1.0	B	P	63.9802	10.9338	5.9217	0.6953	0.4509	0.0036	0.0016	0.0000
			K	64.1751	11.0897	6.2926	0.8730	0.6603	0.0059	0.0026	0.0000
			M	63.9803	10.9319	5.9140	0.7134	0.4849	0.0044	0.0019	0.0000
405	1.0	C	P	68.9396	9.3890	5.1839	0.5984	0.4224	0.0037	0.0016	0.0000
			K	69.1117	9.4950	5.4620	0.7209	0.5660	0.0050	0.0022	0.0000
			M	68.9387	9.3933	5.2200	0.6294	0.4619	0.0044	0.0019	0.0000
406	1.0	D	P	77.3727	6.8350	3.7685	0.4608	0.3311	0.0028	0.0012	0.0000
			K	77.5038	6.8738	3.8713	0.5171	0.4060	0.0036	0.0016	0.0000
			M	77.3717	6.8366	3.7926	0.4978	0.3884	0.0040	0.0017	0.0000
407	1.0	E	P	83.8239	4.7010	2.6234	0.3982	0.2550	0.0023	0.0010	0.0000
			K	83.9213	4.7108	2.6466	0.4137	0.2770	0.0025	0.0011	0.0000
			M	83.8112	4.6976	2.6239	0.4173	0.2865	0.0031	0.0013	0.0000
408	1.0	F	P	93.7485	1.3469	0.7104	0.3188	0.0885	0.0008	0.0003	0.0000
			K	93.7944	1.3473	0.7109	0.3194	0.0896	0.0007	0.0003	0.0000
			M	93.7321	1.3492	0.7186	0.3477	0.1054	0.0011	0.0005	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F.				(continued)							
409	1.5	A	P	58.5537	11.8473	5.0230	0.2526	0.1108	0.0006	0.0003	0.0000
			K	58.8579	12.1591	5.7117	0.3846	0.1921	0.0010	0.0004	0.0000
			M	58.5499	11.8328	4.9717	0.2545	0.1152	0.0006	0.0003	0.0000
410	1.5	B	P	63.4898	10.3543	4.4006	0.2206	0.0919	0.0004	0.0002	0.0000
			K	63.7628	10.5845	5.0013	0.3493	0.1678	0.0009	0.0004	0.0000
			M	63.4782	10.3568	4.4863	0.2557	0.1144	0.0006	0.0002	0.0000
411	1.5	C	P	68.4236	8.9139	3.9407	0.2029	0.0990	0.0007	0.0002	0.0000
			K	68.6675	9.0625	4.3411	0.2885	0.1438	0.0008	0.0004	0.0000
			M	68.4059	8.9082	3.9929	0.2300	0.1094	0.0007	0.0003	0.0000
412	1.5	D	P	76.8199	6.5072	2.9244	0.1656	0.0754	0.0004	0.0002	0.0000
			K	77.0057	6.5607	3.0768	0.2069	0.1032	0.0006	0.0002	0.0000
			M	76.8126	6.5079	2.9717	0.1959	0.0984	0.0006	0.0002	0.0000
413	1.5	E	P	83.0419	4.4807	2.0596	0.1508	0.0612	0.0003	0.0001	0.0000
			K	83.3820	4.4962	2.1034	0.1655	0.0704	0.0004	0.0002	0.0000
			M	83.2428	4.4861	2.0947	0.1751	0.0779	0.0005	0.0002	0.0000
414	1.5	F	P	93.1208	1.2833	0.5581	0.1208	0.0209	0.0001	0.0000	0.0000
			K	93.1916	1.2859	0.5650	0.1278	0.0228	0.0001	0.0000	0.0000
			M	93.1021	1.2892	0.5771	0.1484	0.0286	0.0001	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
b) 50 lb./sq.in.abs.; 90°F. (continued)											
415	2.0	A	P	58.0793	11.1638	3.4558	0.0803	0.0283	0.0001	0.0000	0.0000
			K	58.4771	11.5790	4.3425	0.1521	0.0598	0.0003	0.0001	0.0000
			M	58.0774	11.1598	3.5217	0.0937	0.0349	0.0002	0.0000	0.0000
416	2.0	B	P	62.9922	9.7710	3.0595	0.0736	0.0250	0.0001	0.0000	0.0000
			K	63.3502	10.0795	3.8023	0.1382	0.0522	0.0002	0.0000	0.0000
			M	62.9563	9.7594	3.1719	0.0695	0.0332	0.0001	0.0000	0.0000
417	2.0	C	P	67.9040	8.4323	2.8037	0.0700	0.0251	0.0001	0.0000	0.0000
			K	68.2233	8.6301	3.3005	0.1141	0.0447	0.0002	0.0000	0.0000
			M	67.8554	8.4071	2.8578	0.0833	0.0319	0.0001	0.0000	0.0000
418	2.0	D	P	76.2702	6.1891	2.1738	0.0640	0.0238	0.0001	0.0000	0.0000
			K	76.5076	6.2476	2.3392	0.0818	0.0321	0.0001	0.0000	0.0000
			M	76.2339	6.1678	2.1944	0.0744	0.0295	0.0001	0.0000	0.0000
419	2.0	E	P	82.6543	4.2529	1.5165	0.0545	0.0174	0.0001	0.0000	0.0000
			K	82.8426	4.2817	1.5992	0.0655	0.0219	0.0001	0.0000	0.0000
			M	82.6232	4.2557	1.5614	0.0668	0.0230	0.0001	0.0000	0.0000
420	2.0	F	P	92.4934	1.2201	0.4181	0.0458	0.0063	0.0000	0.0000	0.0000
			K	92.5888	1.2245	0.4296	0.0505	0.0071	0.0000	0.0000	0.0000
			M	92.4557	1.2275	0.4414	0.0600	0.0089	0.0000	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F.											
421	0.1	A	P	59.6739	13.4062	9.1561	2.3509	3.8976	0.7842	0.4985	0.0318
			K	59.8413	13.6603	9.6428	2.7088	4.7518	1.3184	1.0893	0.0888
			M	59.6772	13.4094	9.1539	2.3296	3.7664	0.6160	0.3241	0.0113
422	0.1	B	P	64.6798	11.7099	8.1006	2.1970	3.5688	0.7605	0.5005	0.0341
			K	64.8280	11.8914	8.4433	2.4608	4.1513	1.1471	0.9456	0.0770
			M	64.6770	11.7055	8.0858	2.1731	3.4570	0.6239	0.3500	0.0137
423	0.1	C	P	69.6866	10.0562	7.0961	1.8609	3.1903	0.7186	0.4940	0.0358
			K	69.8148	10.1814	7.3289	2.0316	3.5582	0.9810	0.8139	0.0660
			M	69.6756	10.0450	7.0685	1.8332	3.0808	0.6016	0.3596	0.0156
424	0.1	D	P	78.1994	7.3117	5.0957	1.3837	2.4245	0.5904	0.4282	0.0346
			K	78.2923	7.3707	5.1944	1.4573	2.5523	0.7007	0.5785	0.0471
			M	78.2040	7.3147	5.1017	1.3870	2.4308	0.5744	0.3982	0.0248
425	0.1	E	P	84.7179	5.024	3.5123	1.1334	1.7272	0.4534	0.3370	0.0382
			K	84.7751	5.0514	3.5511	1.1658	1.7416	0.4827	0.3910	0.0401
			M	84.7145	5.0267	3.5172	1.1366	1.7298	0.4479	0.3270	0.0316
426	0.1	F	P	94.7216	1.4418	0.9514	0.8951	0.5734	0.1498	0.1249	0.0116
			K	94.7487	1.4447	0.9539	0.9001	0.5630	0.1453	0.1237	0.0102
			M	94.7148	1.4410	0.9516	0.8958	0.5794	0.1493	0.1215	0.0116

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	i-C_4H_{10}	C_4H_{10}	i-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
427	0.2	A	P	59.4282	13.0362	8.3777	1.7823	2.3386	0.1937	0.057	0.0019
			K	59.6825	13.4207	9.0756	2.2588	3.2210	0.4496	0.2428	0.0059
			M	59.4381	13.0460	8.3718	1.7290	2.1064	0.1299	0.0456	0.0010
428	0.2	B	P	64.4255	11.4016	7.4451	1.6930	2.2095	0.1994	0.0802	0.0021
			K	64.6561	11.6828	7.9467	2.0515	2.8140	0.3912	0.2108	0.0051
			M	64.4520	11.4308	7.4910	1.6953	2.1424	0.1618	0.0602	0.0013
429	0.2	C	P	69.4256	9.8042	6.5496	1.4528	1.9975	0.1843	0.0762	0.0018
			K	69.6296	10.0028	6.8978	1.6941	2.4120	0.3345	0.1814	0.0044
			M	69.4398	9.8161	6.5660	1.4479	1.9628	0.1637	0.0634	0.0015
430	0.2	D	P	77.9309	7.1438	4.7299	1.0973	1.5347	0.1634	0.0728	0.0018
			K	78.0847	7.2414	4.8889	1.2152	1.7301	0.2389	0.1290	0.0031
			M	77.9560	7.1590	4.7672	1.1257	1.6489	0.1789	0.0765	0.0019
431	0.2	E	P	84.4370	4.9169	3.2808	0.9211	1.1643	0.1433	0.0651	0.0023
			K	84.5503	4.9628	3.3422	0.9721	1.1805	0.1646	0.0872	0.0027
			M	84.4706	4.9299	3.3096	0.9465	1.2384	0.1626	0.0742	0.0027
432	0.2	F	P	94.4525	1.4144	0.8985	0.7576	0.4334	0.0624	0.0322	0.0011
			K	94.4974	1.4193	0.8978	0.7505	0.3816	0.0495	0.0275	0.0007
			M	94.4525	1.4144	0.8981	0.7545	0.4255	0.0587	0.0300	0.0010

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
433	0.5	A	F	58.7643	12.0417	6.3182	0.5993	0.3209	0.0065	0.0018	0.0000
			K	59.2063	12.7017	7.3772	1.0418	0.5658	0.0174	0.0063	0.0001
			M	58.7686	12.0286	6.2044	0.5221	0.2671	0.0050	0.0014	0.0000
434	0.5	B	F	63.7357	10.5691	5.6823	0.5955	0.3183	0.0069	0.0020	0.0000
			K	64.1402	11.0569	6.4596	0.9462	0.4943	0.0152	0.0054	0.0001
			M	63.7722	10.6005	5.7059	0.5781	0.3136	0.0063	0.0018	0.0000
435	0.5	C	F	68.7134	9.1192	5.0737	0.5454	0.3192	0.0072	0.0021	0.0000
			K	69.0740	9.4669	5.6069	0.7814	0.4236	0.0130	0.0047	0.0001
			M	68.7206	9.1178	5.0424	0.5137	0.3010	0.0063	0.0018	0.0000
436	0.5	D	F	77.1849	6.6792	3.7499	0.4561	0.2896	0.0070	0.0021	0.0000
			K	77.4616	6.8535	3.9740	0.5605	0.3039	0.0093	0.0033	0.0000
			M	77.2007	6.6856	3.7535	0.4509	0.2986	0.0069	0.0020	0.0000
437	0.5	E	F	83.6665	4.6122	2.6191	0.3938	0.2166	0.0057	0.0017	0.0000
			K	83.8757	4.6969	2.7168	0.4484	0.2074	0.0064	0.0022	0.0000
			M	83.6696	4.6122	2.6303	0.3994	0.2418	0.0061	0.0017	0.0000
438	0.5	F	F	93.6491	1.3331	0.7309	0.3490	0.0852	0.0022	0.0007	0.0000
			K	93.7434	1.3433	0.7297	0.3461	0.0670	0.0019	0.0007	0.0000
			M	93.6591	1.3338	0.7361	0.3647	0.0104	0.0028	0.0008	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
439	0.8	A	P	58.1255	11.0865	4.4028	0.1577	0.0505	0.0008	0.0002	0.0000
			K	58.7302	11.9828	5.7162	0.3680	0.1013	0.0021	0.0007	0.0000
			M	58.1564	11.0987	4.3632	0.1511	0.0530	0.0008	0.0002	0.0000
440	0.8	B	P	63.0694	9.7666	4.0595	0.1672	0.0529	0.0008	0.0002	0.0000
			K	63.6243	10.4311	5.0052	0.3342	0.0885	0.0018	0.0006	0.0000
			M	63.0816	9.7577	4.0003	0.1584	0.0550	0.0008	0.0002	0.0000
441	0.8	C	P	68.0228	8.4566	3.6826	0.1532	0.0469	0.0007	0.0002	0.0000
			K	68.5185	8.9311	4.3446	0.2760	0.0759	0.0016	0.0005	0.0000
			M	68.0625	8.4791	3.7144	0.1627	0.0617	0.0009	0.0002	0.0000
442	0.8	D	P	76.4555	6.2263	2.8499	0.1551	0.0617	0.0009	0.0002	0.0000
			K	76.8386	6.4656	3.0793	0.1980	0.0544	0.0011	0.0004	0.0000
			M	76.4730	6.2296	2.8113	0.1463	0.0590	0.0009	0.0002	0.0000
443	0.8	E	P	82.9100	4.3136	1.9766	0.1251	0.0349	0.0006	0.0002	0.0000
			K	83.2010	4.4311	2.1051	0.1584	0.0371	0.0007	0.0003	0.0000
			M	82.9020	4.3078	1.9983	0.1346	0.0482	0.0007	0.0002	0.0000
444	0.8	F	P	92.8472	1.2523	0.5586	0.1147	0.0130	0.0002	0.0001	0.0000
			K	92.9894	1.2673	0.5645	0.1223	0.0120	0.0002	0.0001	0.0000
			M	92.8753	1.2543	0.5793	0.1383	0.0229	0.0003	0.0001	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
445	1.0	A	P	57.6997	10.4491	3.2421	0.0634	0.0154	0.0002	0.0002	0.0000
			K	58.4127	11.5038	4.6752	0.1808	0.0394	0.0007	0.0002	0.0000
			M	57.7252	10.4452	3.2555	0.0681	0.0211	0.0002	0.0001	0.0000
446	1.0	B	P	62.6258	9.8322	3.0627	0.0701	0.0172	0.0002	0.0001	0.0000
			K	63.2804	10.0141	4.0936	0.1642	0.0344	0.0006	0.0002	0.0000
			M	62.6793	9.2674	3.1303	0.0782	0.0240	0.0003	0.0001	0.0000
447	1.0	C	P	67.5611	8.0155	2.9430	0.0795	0.0255	0.0003	0.0001	0.0000
			K	68.1481	8.5740	3.5533	0.1356	0.0295	0.0005	0.0002	0.0000
			M	67.5858	8.0170	2.8569	0.0740	0.0241	0.0003	0.0001	0.0000
448	1.0	D	P	75.9715	5.9248	2.2462	0.0688	0.0206	0.0003	0.0001	0.0000
			K	76.4233	6.2071	2.5185	0.0973	0.0212	0.0004	0.0001	0.0000
			M	75.9763	5.9187	2.2242	0.0690	0.0234	0.0003	0.0001	0.0000
449	1.0	E	P	82.4079	4.1154	1.5789	0.0583	0.0130	0.0002	0.0001	0.0000
			K	82.7513	4.2539	1.7217	0.0778	0.0144	0.0003	0.0001	0.0000
			M	82.3897	4.1047	1.6078	0.0651	0.0194	0.0002	0.0001	0.0000
450	1.0	F	P	92.3132	1.1986	0.4499	0.0538	0.0047	0.0001	0.0000	0.0000
			K	92.4868	1.2166	0.4625	0.0601	0.0041	0.0001	0.0000	0.0000
			M	92.3062	1.1966	0.4717	0.0664	0.0088	0.0001	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$1\text{-}C_4H_{10}$	C_4H_{10}	$1\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
c) 100 lb./sq.in.abs.; 100°F. (continued)											
451	1.5	A	P	56.6151	8.8328	1.3587	0.0115	0.0026	0.0000	0.0000	0.0000
			K	57.6190	10.3083	2.5584	0.0378	0.0063	0.0001	0.0000	0.0000
			M	56.6389	8.8134	1.4018	0.0130	0.0035	0.0000	0.0000	0.0000
452	1.5	B	P	61.5022	7.8759	1.3335	0.0126	0.0027	0.0000	0.0000	0.0000
			K	62.4206	8.9734	2.2402	0.0343	0.0055	0.0001	0.0000	0.0000
			M	61.5195	7.8643	1.3835	0.0144	0.0037	0.0000	0.0000	0.0000
453	1.5	C	P	66.4039	6.9005	1.2850	0.0124	0.0027	0.0000	0.0000	0.0000
			K	67.2222	7.6830	1.9445	0.0283	0.0047	0.0001	0.0000	0.0000
			M	66.4271	6.9006	1.3546	0.0147	0.0040	0.0000	0.0000	0.0000
454	1.5	D	P	74.7566	5.1670	1.1286	0.0111	0.0022	0.0000	0.0000	0.0000
			K	75.3849	5.5620	1.3782	0.0203	0.0034	0.0001	0.0000	0.0000
			M	74.7485	5.1537	1.1209	0.0140	0.0039	0.0000	0.0000	0.0000
455	1.5	E	P	81.1520	3.6195	0.8027	0.0111	0.0020	0.0000	0.0000	0.0000
			K	81.6270	3.8118	0.9422	0.0163	0.0023	0.0000	0.0000	0.0000
			M	81.0992	3.5952	0.8345	0.0133	0.0032	0.0000	0.0000	0.0000
456	1.5	F	P	90.9754	1.0643	0.2317	0.0102	0.0007	0.0000	0.0000	0.0000
			K	91.2302	1.0902	0.2531	0.0125	0.0007	0.0000	0.0000	0.0000
			M	90.9366	1.0580	0.2597	0.0138	0.0014	0.0000	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i-C_4H_{10}$	C_4H_{10}	$i-C_5H_{12}$	C_5H_{12}	C_6H_{14}
e) 100 lb./sq.in.abs.; 100°F. (continued)											
457	2.0	A	P	55.5067	7.1779	0.4837	0.0026	0.0005	0.0000	0.0000	0.0000
			K	56.8254	9.1222	1.2867	0.0108	0.0016	0.0000	0.0000	0.0000
			M	55.5685	7.2587	0.5954	0.0037	0.0009	0.0000	0.0000	0.0000
458	2.0	B	P	60.3568	6.5067	0.5011	0.0029	0.0005	0.0000	0.0000	0.0000
			K	61.5608	7.9409	1.1266	0.0098	0.0014	0.0000	0.0000	0.0000
			M	60.3534	6.4944	0.5828	0.0039	0.0009	0.0000	0.0000	0.0000
459	2.0	C	P	62.2247	5.7776	0.5086	0.0030	0.0006	0.0000	0.0000	0.0000
			K	66.2963	6.7990	0.9779	0.0081	0.0012	0.0000	0.0000	0.0000
			M	65.2348	5.7791	0.5949	0.0040	0.0010	0.0000	0.0000	0.0000
460	2.0	D	P	73.5243	4.4075	0.4345	0.0028	0.0005	0.0000	0.0000	0.0000
			K	74.3466	4.9221	0.6931	0.0058	0.0009	0.0000	0.0000	0.0000
			M	73.5537	4.4217	0.5379	0.0041	0.0010	0.0000	0.0000	0.0000
461	2.0	E	P	79.8715	3.1214	0.3558	0.0029	0.0004	0.0000	0.0000	0.0000
			K	80.5026	3.3733	0.4738	0.0047	0.0006	0.0000	0.0000	0.0000
			M	79.8737	3.1182	0.4191	0.0040	0.0009	0.0000	0.0000	0.0000
462	2.0	F	P	89.6388	0.9312	0.1099	0.0028	0.0002	0.0000	0.0000	0.0000
			K	89.9735	0.9647	0.1273	0.0036	0.0002	0.0000	0.0000	0.0000
			M	89.6367	0.9279	0.1357	0.0041	0.0004	0.0000	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F.											
463	0.1	A	P	56.8364	10.7464	4.8153	0.4594	0.3341	0.0209	0.0043	0.0000
			K	59.2532	13.0421	8.3025	1.9173	2.6921	0.4021	0.1412	0.0026
			M	57.2312	10.9281	4.3993	0.2219	0.1060	0.0044	0.0080	0.0000
464	0.1	B	P	62.0779	9.7163	4.6861	0.5284	0.3990	0.0268	0.0057	0.0000
			K	64.1910	11.3531	7.2697	1.7414	2.3519	0.3498	0.1226	0.0022
			M	62.3233	9.7911	4.3492	0.2893	0.1459	0.0065	0.0011	0.0000
465	0.1	C	P	67.3162	8.5926	4.4593	0.5422	0.4593	0.0334	0.0073	0.0001
			K	69.1287	9.7206	6.3102	1.4379	2.0159	0.2992	0.1055	0.0019
			M	67.4702	8.6249	4.2343	0.3459	0.2046	0.0100	0.0018	0.0000
466	0.1	D	P	76.2117	6.5083	3.6074	0.5417	0.5277	0.0447	0.0104	0.0001
			K	77.5229	7.0371	4.4724	1.0315	1.4460	0.2137	0.0750	0.0014
			M	76.1994	6.4813	3.4600	0.4058	0.2994	0.0173	0.0034	0.0001
467	0.1	E	P	82.9864	4.5820	2.6701	0.5308	0.4788	0.0439	0.0104	0.0002
			K	83.9420	4.8227	3.0575	0.8252	0.9867	0.1472	0.0507	0.0011
			M	82.9916	4.5771	2.6324	0.4743	0.3765	0.0283	0.0059	0.0001
468	0.1	F	P	93.3316	1.3505	0.7863	0.5380	0.2486	0.0890	0.0096	0.0002
			K	93.8176	1.3793	0.8213	0.6371	0.3190	0.1266	0.0160	0.0003
			M	93.2911	1.3474	0.7791	0.5103	0.2182	0.0639	0.0059	0.0001

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
469	0.2	A	P	55.4250	9.4204	3.0940	0.1443	0.0799	0.0036	0.0007	0.0000
			K	58.5064	12.1841	6.4117	0.8743	0.6596	0.0371	0.0082	0.0001
			M	55.9629	9.5741	2.4271	0.0545	0.0021	0.0008	0.0001	0.0000
470	0.2	B	P	60.6233	8.5894	3.1013	0.1721	0.0951	0.0044	0.0008	0.0000
			K	63.3819	10.6063	5.6142	0.7941	0.5762	0.0323	0.0071	0.0001
			M	61.2485	8.8665	2.8203	0.0906	0.0360	0.0014	0.0002	0.0000
471	0.2	C	P	65.8416	7.6631	3.0401	0.1834	0.1092	0.0053	0.0010	0.0000
			K	68.2575	9.0811	4.8731	0.6558	0.4939	0.0276	0.0061	0.0001
			M	65.8625	7.5251	2.3522	0.0603	0.0279	0.0011	0.0002	0.0000
472	0.2	D	P	74.7228	5.8817	2.5680	0.1934	0.1222	0.0063	0.0012	0.0000
			K	76.5459	6.5742	3.4539	0.4704	0.3543	0.0197	0.0044	0.0001
			M	74.8510	5.8848	2.3498	0.1165	0.0553	0.0023	0.0004	0.0000
473	0.2	E	P	81.4961	4.1773	1.9564	0.1991	0.1117	0.0060	0.0011	0.0000
			K	82.8841	4.5055	2.3612	0.3763	0.2417	0.0136	0.0030	0.0000
			M	81.6226	4.1935	1.8920	0.1524	0.0702	0.0032	0.0006	0.0000
474	0.2	F	P	91.8498	1.2439	0.5842	0.2013	0.0482	0.0069	0.0005	0.0000
			K	92.6351	1.2885	0.6343	0.2905	0.0781	0.0117	0.0009	0.0000
			M	92.0429	1.2579	0.6126	0.2204	0.0543	0.0079	0.0005	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
475	0.5	A	P	51.4054	5.7542	0.4214	0.0038	0.0012	0.0000	0.0000	0.0000
			K	56.2660	9.6186	2.0032	0.0525	0.0183	0.0006	0.0000	0.0000
			M	52.0985	5.7111	0.3274	0.0028	0.0009	0.0000	0.0000	0.0000
476	0.5	B	P	56.5474	5.4208	0.3965	0.0042	0.0013	0.0000	0.0000	0.0000
			K	60.9548	8.3730	1.7540	0.0477	0.0160	0.0005	0.0000	0.0000
			M	56.7714	5.2131	0.3326	0.0031	0.0010	0.0000	0.0000	0.0000
477	0.5	C	P	61.7116	5.0536	0.4596	0.0050	0.0016	0.0000	0.0000	0.0000
			K	65.6437	7.1689	1.5225	0.0394	0.0137	0.0004	0.0000	0.0000
			M	61.7453	4.8263	0.3741	0.0035	0.0012	0.0000	0.0000	0.0000
478	0.5	D	P	70.5271	4.1175	0.4981	0.0063	0.0017	0.0000	0.0000	0.0000
			K	73.6147	5.1899	1.0791	0.0282	0.0098	0.0003	0.0000	0.0000
			M	70.5623	4.0277	0.4470	0.0051	0.0017	0.0000	0.0000	0.0000
479	0.5	E	P	77.2649	3.0276	0.4264	0.0070	0.0020	0.0000	0.0000	0.0000
			K	79.7102	3.5568	0.7377	0.0226	0.0067	0.0001	0.0000	0.0000
			M	77.3152	3.0025	0.4302	0.0067	0.0020	0.0000	0.0000	0.0000
480	0.5	F	P	87.5929	0.9380	0.1542	0.0090	0.0011	0.0001	0.0000	0.0000
			K	89.0878	1.0172	0.1982	0.0174	0.0022	0.0002	0.0000	0.0000
			M	87.5715	0.9394	0.1708	0.0096	0.0012	0.0001	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_2H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
481	0.8	A	P	47.4652	2.7194	0.0456	0.0003	0.0001	0.0000	0.0000	0.0000
			K	54.0257	7.1400	0.4973	0.0068	0.0021	0.0001	0.0000	0.0000
			M	47.8287	2.6862	0.0549	0.0004	0.0001	0.0000	0.0000	0.0000
482	0.8	B	P	52.5558	2.8521	0.0594	0.0005	0.0001	0.0000	0.0000	0.0000
			K	58.5278	6.2153	0.4354	0.0062	0.0018	0.0001	0.0000	0.0000
			M	52.9503	2.8495	0.0711	0.0005	0.0001	0.0000	0.0000	0.0000
483	0.8	C	P	57.6660	2.9420	0.0900	0.0006	0.0002	0.0000	0.0000	0.0000
			K	63.0299	5.3215	0.3780	0.0051	0.0016	0.0000	0.0000	0.0000
			M	57.8139	2.7628	0.0807	0.0006	0.0002	0.0000	0.0000	0.0000
484	0.8	D	P	66.4288	2.5865	0.1000	0.0008	0.0002	0.0000	0.0000	0.0000
			K	70.6836	3.0525	0.2679	0.0037	0.0011	0.0000	0.0000	0.0000
			M	66.6989	2.5679	0.1049	0.0008	0.0002	0.0000	0.0000	0.0000
485	0.8	E	P	73.1208	1.9885	0.0903	0.0009	0.0002	0.0000	0.0000	0.0000
			K	76.5363	2.6402	0.1831	0.0029	0.0008	0.0000	0.0000	0.0000
			M	73.3299	2.0020	0.1027	0.0009	0.0002	0.0000	0.0000	0.0000
486	0.8	F	P	83.3914	0.6558	0.0350	0.0011	0.0001	0.0000	0.0000	0.0000
			K	85.5406	0.7551	0.0492	0.0023	0.0002	0.0000	0.0000	0.0000
			M	83.4635	6.6372	0.0437	0.0013	0.0001	0.0000	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i-C_4H_{10}$	C_4H_{10}	$i-C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
487	1.0	A	P	44.7588	1.5811	0.0191	0.0001	0.0000	0.0000	0.0000	0.0000
			K	52.5322	5.6319	0.2133	0.0024	0.0007	0.0000	0.0000	0.0000
			M	44.9779	1.5434	0.0213	0.0001	0.0000	0.0000	0.0000	0.0000
488	1.0	B	P	49.8484	1.7437	0.0246	0.0002	0.0000	0.0000	0.0000	0.0000
			K	56.9099	4.9026	0.1868	0.0022	0.0006	0.0000	0.0000	0.0000
			M	50.0538	1.7076	0.0275	0.0002	0.0000	0.0000	0.0000	0.0000
489	1.0	C	P	54.9632	1.8215	0.0301	0.0002	0.0000	0.0000	0.0000	0.0000
			K	61.2876	4.1976	0.1621	0.0018	0.0005	0.0000	0.0000	0.0000
			M	55.2017	1.8144	0.0347	0.0002	0.0000	0.0000	0.0000	0.0000
490	1.0	D	P	63.6881	1.7276	0.0353	0.0003	0.0000	0.0000	0.0000	0.0000
			K	68.7296	3.0388	0.1149	0.0013	0.0004	0.0000	0.0000	0.0000
			M	63.7987	1.7292	0.0418	0.0003	0.0000	0.0000	0.0000	0.0000
491	1.0	E	P	70.3496	1.3886	0.0332	0.0003	0.0000	0.0000	0.0000	0.0000
			K	74.4206	2.0826	0.0786	0.0010	0.0003	0.0000	0.0000	0.0000
			M	70.5072	1.4249	0.0427	0.0004	0.0000	0.0000	0.0000	0.0000
492	1.0	F	P	80.5638	0.4801	0.0133	0.0004	0.0000	0.0000	0.0000	0.0000
			K	83.1760	0.5956	0.0211	0.0008	0.0000	0.0000	0.0000	0.0000
			M	80.4348	0.4882	0.0177	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	1-C_4H_{10}	C_4H_{10}	1-C_5H_{12}	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
493	1.5	A	P	37.8194	0.3260	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000
			K	48.8001	2.7846	0.0380	0.0004	0.0001	0.0000	0.0000	0.0000
			M	37.8819	0.4056	0.0034	0.0000	0.0000	0.0000	0.0000	0.0000
494	1.5	B	P	42.9209	0.4055	0.0027	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.8668	2.4240	0.0333	0.0003	0.0001	0.0000	0.0000	0.0000
			M	43.0410	0.4930	0.0046	0.0000	0.0000	0.0000	0.0000	0.0000
495	1.5	C	P	48.0350	0.0737	0.0035	0.0000	0.0000	0.0000	0.0000	0.0000
			K	56.9334	2.0754	0.0289	0.0003	0.0001	0.0000	0.0000	0.0000
			M	48.0431	0.5528	0.0057	0.0000	0.0000	0.0000	0.0000	0.0000
496	1.5	D	P	56.7454	0.5338	0.0045	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.8468	1.5025	0.0205	0.0002	0.0001	0.0000	0.0000	0.0000
			M	56.5316	0.5899	0.0068	0.0000	0.0000	0.0000	0.0000	0.0000
497	1.5	E	P	63.3624	0.4686	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000
			K	69.1334	1.0297	0.0140	0.0002	0.0000	0.0000	0.0000	0.0000
			M	63.4054	0.5465	0.0073	0.0000	0.0000	0.0000	0.0000	0.0000
498	1.5	F	P	73.4768	0.1885	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
			K	77.2668	0.2945	0.0038	0.0001	0.0000	0.0000	0.0000	0.0000
			M	73.2920	0.2109	0.0031	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE V (continued)

Case	L/G	Feed	Key	CH_4	C_2H_6	C_3H_8	$i\text{-}C_4H_{10}$	C_4H_{10}	$i\text{-}C_5H_{12}$	C_5H_{12}	C_6H_{14}
d) 500 lb./sq.in.abs.; 110°F. (continued)											
499	2.0	A	P	30.7716	0.0807	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
			K	45.0747	1.2837	0.0102	0.0001	0.0000	0.0000	0.0000	0.0000
			M	31.1132	0.1314	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
500	2.0	B	P	35.8809	0.1075	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000
			K	48.8310	1.1174	0.0090	0.0001	0.0000	0.0000	0.0000	0.0000
			M	36.1681	0.1644	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000
501	2.0	C	P	41.0052	0.1339	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000
			K	52.5872	0.9567	0.0078	0.0001	0.0000	0.0000	0.0000	0.0000
			M	41.2467	0.1951	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000
502	2.0	D	P	49.7389	0.1681	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000
			K	53.9723	0.6926	0.0055	0.0000	0.0000	0.0000	0.0000	0.0000
			M	49.8546	0.2277	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
503	2.0	E	P	56.3934	0.1650	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000
			K	63.8559	0.4747	0.0038	0.0000	0.0000	0.0000	0.0000	0.0000
			M	56.5178	0.2158	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000
504	2.0	F	P	66.3949	0.0705	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
			K	71.3833	0.1358	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000
			M	66.4249	0.0908	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000