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CALCULATION OF TRANSPORT PROPERTIES AND HEAT-TRANSFER PARAMETERS OF DISSOCIATING HYDROGEN

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SUMMARY

The transport properties, Prandtl, Lewis, and Schmidt numbers, thermal-diffusion ratio, and molar heat capacity at constant pressure, of dissociating hydrogen were calculated over a range of temperature from 300° to 10,000° K and pressure from 10^{-4} to 10^{2} atmospheres. From these calculations, the transport properties of hydrogen based on the latest information concerning the intermolecular properties were tabulated. Rigorous kinetic theory formulas were used for the calculations. Ionization was neglected in the calculations, but data are presented for the range of temperature and pressure where it is considered negligible. The values of this report compare reasonably well with those of other investigators.

INTRODUCTION

In recent years interest in the use of hydrogen in nuclear rockets and electrothermal jet engines has increased; however, reliable engine designs employing hydrogen are limited by the lack of data on the transport properties of hydrogen at high temperatures. The intent of the present investigation was to provide tables of calculated transport properties of hydrogen at elevated temperatures based on the most reliable information concerning the intermolecular properties of hydrogen.

The transport properties (viscosity, thermal conductivity, and diffusion coefficient), the thermal-diffusion ratio, the Lewis, Prandtl, and Schmidt numbers, and the molar heat capacity at constant pressure of hydrogen were calculated for temperatures from 300° to 10,000° K and for pressures from 10^{-4} to 10^{2} atmospheres. Ionization was neglected in the calculations; however, data are presented to indicate the range of temperature and pressure where ionization may be considered negligible.

Unknown to the author at the time these calculations were in process, similar calculations of the transport properties and the thermal-diffusion ratio of hydrogen, which followed the same general procedure used herein, were being carried out by others (ref. 1). The calculations differed in two respects: First, reference 1 neglects ionic excitation of molecular hydrogen in its values of the molar heat capacity at constant pressure C_{p,H_2} used at temperatures above 3500° K and assumes that C_{p,H_2} has reached the classical value of (9/2)R at 3500° K and is constant at higher temperatures. This assumption is not made herein, and the first four excited states of hydrogen are considered in the calculation of C_{p,H_2}. Second, reference 1 fits the portion of the $H\text{-}H^1\Sigma$ potential-energy curve of interest with a function of the form Br^{-m}, where B and m are parameters. Two sets of parameters were required to fit this portion of the curve; one set was valid at low temperatures and the other set was valid at the high temperatures. In this report the portion of the $H\text{-}H^1\Sigma$ potential-energy curve of interest is fitted with one set of parameters A and ρ in an exponential function of the form $Ae^{-r/\rho}$. For transport-property calculations, a single analytical function is preferred, in general, to represent the actual potential energy over the largest possible temperature interval. The potential-energy function used here for the $H\text{-}H^1\Sigma$ interaction therefore represents a slight improvement over the function of reference 1.

POTENTIAL ENERGY OF INTERACTION

The collision integrals $\Omega^{(l,n)^*}$ that are needed to calculate the transport properties are given in the literature in terms of the interaction potential energy $\varphi(r)$. (For eq., see ref. 2.) (All symbols are defined in appendix A.) This potential energy, for most atomic particles, corresponds to an attractive force between particles to a certain separation where a minimum in the potential energy is reached: for closer approach the potential corresponds to a repulsive force. Although the collision integrals are an integral function of the interaction potential over the complete range of separation distance of the interacting particles (see eq. 8.2-1 of ref. 2), it is pointed out (refs. 3 and 4) that the numerical values of the transport properties at a given temperature are mainly determined by the interaction potential energy only over a finite portion of the range. Reasonable results can therefore be achieved by fitting the known interaction energy accurately by a simple algebraic expression over the range of separation distance important for a given transport property and by tolerating a poor fit at the less important separations. Two forms of algebraic expression for the interaction potentials that yield calculated transport and thermodynamic properties, which are in reasonable agreement with experimental values

at low and intermediate temperatures, are the Lennard-Jones (6-12) and the modified Buckingham (6-exp) potentials (refs. 5 and 6). It is doubtful that the same parameters used in these potentials to correlate data at low and intermediate temperatures can be used at high temperatures (refs. 6 and 7). For hydrogen gas, which is considered herein, however, the attractive force between two hydrogen molecules is negligible at high temperatures; therefore, a strictly repulsive-type expression for the potential may be used for the interaction potential. Similar remarks are applicable for a hydrogen molecule interacting with a hydrogen atom or two hydrogen atoms interacting along the $^3\Sigma$ energy curve. For two hydrogen atoms interacting along the $^1\Sigma$ energy curve, the repulsive force is negligible, since the minimum in the potential is very deep. Thus, only attractive forces are influential for this interaction in the separation distances important for the transport properties, and, therefore, the interaction energy may be replaced by a strictly attractive potential at the high temperatures. One investigation (ref. 8) found that an exponential potential of the form $Ae^{-r/\rho}$ was a fair fit to both the potential obtained from high-temperature scattering data and a portion of the potential obtained from low-temperature viscosity data. It is this form of potential that is used in the present calculation at high temperatures.

H_2-H_2 Interaction Potential

The modified Buckingham (6-exp) potential was used to represent the potential energy of interaction at the low temperatures and, as described previously, the exponential-repulsive potential was used to represent the potential energy of interaction at the high temperatures. The equations for these potentials are:

Modified Buckingham potential (ref. 2):

$$\varphi(r) = \frac{\epsilon}{1 - \frac{6}{s}} \left\{ \frac{6}{s} \exp\left[s\left(1 - \frac{r}{r_m}\right)\right] - \left(\frac{r_m}{r}\right)^6 \right\}$$

Exponential potential (ref. 9):

$$\varphi = Ae^{-r/\rho}$$

where ϵ is the depth of the potential at the minimum, r_m is the value of r for the energy minimum, s is the steepness of the exponential-repulsive term in the modified Buckingham potential, and ρ and A are suitable constant parameters peculiar to the type of interaction. The constant A is positive for repulsive potentials and negative for attractive potentials.

The only quantity required in the calculations that is a function of the H_2-H_2 interaction potential is the product of the collision integral $\Omega^{(l,n)*}_{H_2-H_2}$ and the square of the collision cross section σ^2. This quantity was found for high temperatures by using the exponential-repulsive potential and for the low temperatures by using the modified Buckingham potential. The procedure for obtaining $\sigma^2\Omega^{(l,n)*}$ is given in appendix B. The temperature for the crossover from the exponential-6 potential to the exponential-repulsive potential was chosen so that the quantity $\sigma^2\Omega^{(l,n)*}_{H_2-H_2}$ found with one potential was equal to the quantity $\sigma^2\Omega^{(l,n)*}_{H_2-H_2}$ found with the other potential. At this value of $\sigma^2\Omega^{(l,n)*}_{H_2-H_2}$, the curve as a function of temperature was not smooth; therefore, a faired curve was used to connect the values found with the two potentials. The error in the quantity $\sigma^2\Omega^{(l,n)*}_{H_2-H_2}$ from this fairing was less than 4 percent.

H-H_2 Interaction Potential

Since the transport properties are a function of gas composition and the amount of atomic hydrogen present in a real gas is small at low temperatures, this interaction will only be important at intermediate to high temperatures. Therefore, the exponential potential is used throughout for this interaction.

H-H Interaction Potential

When two hydrogen atoms collide, the interaction can occur along either of two potentials. Out of every four H-H collisions, there is a possibility that one will follow a $^1\Sigma$ energy curve corresponding to the normal H_2 molecule and that three will follow the $^3\Sigma$ energy curve corresponding to the lowest repulsive state of H_2 (ref. 2, p. 1054). For the potential energy of interaction corresponding to the $^3\Sigma$ energy curve, an exponential-repulsive potential was used in the calculations, and for the potential energy of interaction related to the $^1\Sigma$ energy curve, an exponential-attractive potential was used.

The parameters needed for all the above potentials of interaction are given in table I. The parameters for the modified Buckingham (6-exp) potential were taken from reference 2 (p. 181), and the parameters for the exponential-repulsive or -attractive potentials were taken from reference 10 for the H_2-H_2 and H-H_2 interactions and from reference 11

for the $H\text{-}H\,^3\Sigma$ interaction. For the $H\text{-}H\,^1\Sigma$ interaction, the data of reference 12 were empirically fitted to the exponential potential for $\varphi(r)$ between 10 and 10^4 centimeters^{-1}.

CALCULATION PROCEDURE FOR TRANSPORT PROPERTIES

The transport properties (viscosity, thermal conductivity, and diffusion coefficient) and the thermal-diffusion ratio are calculated for temperatures ranging from 300° to 10,000° K and for pressures ranging from 10^{-4} to 10^2 atmospheres. Since ionization is neglected throughout, the calculations are not expected to be applicable for the complete range of temperature and pressure computed. The transport properties calculated for the pure components (table II), however, should be useful even when ionization is included in the calculation.

The range of application of the properties listed in table III may be estimated from figure 1. For example, if the ionization is assumed negligible when 4 percent or less of the atoms present are ionized, the results are applicable for all pressures calculated for temperatures up to approximately 7000° K and all temperatures calculated for pressures greater than approximately 3×10^{-2} atmosphere. Temperature and pressure ranges for other negligible ionization percentages may also be estimated from figure 1.

The sign convention followed for the thermal-diffusion ratio is that a negative sign indicates that the hydrogen molecules tend to move into the cool regions and that the hydrogen atoms tend to move toward the warm regions.

The expressions (eqs. (C1), (C17), and (C18)) used in the calculations for viscosity, diffusion coefficient, and thermal-diffusion ratio are the first-approximation expressions presented in reference 2. The thermal conductivity is considered as consisting of three separate contributions due to: (1) translational degrees of freedom, (2) internal degrees of freedom, and (3) chemical reaction (dissociation). The expression used here (eq. (C7)) for the contribution due to the translational degrees of freedom is the first-approximation expression given in reference 2. For the contribution due to the internal degrees of freedom and chemical reaction, the expressions were taken from references 13 and 14, respectively. The equations used for all of these transport properties are given in appendix C.

DISCUSSION OF CALCULATION

Computed values of viscosity, thermal conductivity, diffusion coefficient, and thermal-diffusion ratio are presented in table III at

temperature intervals of 200° K and in figures 2 to 7 for pressures from 10^{-4} to 10^{2} atmospheres and temperatures from 300° to 10,000° K. The figures are drawn for computed values at temperature intervals of 100° K for temperatures between 1000° and 6000° K. These smaller intervals were necessary in order to draw smooth curves for the transport properties within this temperature range. The peak values of the thermal conductivities and thermal-diffusion ratios shown in the figures are the result of drawing smooth curves for these properties with the temperature intervals of 100° K. Since these quantities rise and fall rather sharply near the peak values, the true peak values may be slightly different from the values presented in the figures.

Also listed in table III are the molar heat capacity due to chemical reaction $C_{p,R} = \frac{\lambda_R C_{p,f}}{\lambda_f Le}$ (ref. 13), the equilibrium molar heat capacity at constant pressure $C_{p,e} = C_{p,f} + C_{p,R}$, the frozen thermal conductivity $\lambda_f = \lambda_{tr} + \lambda_{int}$, the degree of dissociation β, the mole fraction of atomic hydrogen x_H, and the contributions to the thermal conductivity of internal degrees of freedom λ_{int}, translational degrees of freedom λ_{tr}, and chemical reaction λ_R. With these quantities, the following dimensionless quantities, which are also given in table III may be calculated:

(1) Frozen Prandtl number:

$$Pr_f = \frac{\eta C_{p,f}}{\lambda_f}$$

(2) Equilibrium Prandtl number:

$$Pr_e = \frac{\eta C_{p,e}}{\lambda}$$

(3) Lewis number:

$$Le = \frac{\rho_o C_{p,f} D_{H-H_2}}{\lambda_f}$$

(4) Frozen Schmidt number:

$$Sc_f = \frac{Pr_f}{Le}$$

The density ρ_o in the Lewis number was calculated with the assumption that the gas was a mixture of ideal gases.

In table II are listed the first-approximation values for the viscosities and thermal conductivities of pure atomic hydrogen and pure molecular hydrogen, calculated from equations (C5) and (C14) in appendix C. From kinetic theory, these quantities are a function of temperature only.

COMPARISON OF RESULTS

The ratios of thermal conductivity due to chemical reaction λ_R, the sum of thermal conductivity due to chemical reaction and internal degrees of freedom $\lambda_R + \lambda_{int}$, and thermal conductivity due to translational degrees of freedom λ_{tr} to the total thermal conductivity of the gas are presented in figure 8 for a pressure of 1 atmosphere. These curves are typical of all pressures. Reference 11 points out that λ_R is a maximum for the degree of dissociation $\beta = 0.5$, which is apparent from a comparison of the temperature for maximum λ_R with the temperature for $\beta = 0.5$ from table III. It should also be noted from the table that at this value of β the thermal conductivity due to chemical reaction is always more than 50 percent of the total thermal conductivity for the cases calculated.

A comparison of the values of the thermal conductivities of this report with those of references 1, 15, and 16 is presented in figure 9 for a pressure of 1 atmosphere. From this figure it is apparent that the values of this report and those of reference 1 are in accord for the temperatures compared below 5000° K, while those of references 15 and 16 are consistently lower than the values of reference 1 and the values reported herein. It is also apparent that, for the temperature at which λ is a maximum, the value of this report is nearly twice that of reference 17 and approximately 1.6 times that of reference 16. Since the data of reference 1 are given in temperature increments of 500° K, a direct comparison of the peak value of this report with the value of reference 1 is impossible. For temperatures above 5000° K, values from reference 1 are slightly lower than those presented in this report. This is probably caused by the different interaction potential reference 1 used for the $H\text{-}H^1\Sigma$ interactions. The difference, however, is always less than 10 percent for the thermal conductivity.

Figure 10 shows a comparison of the values for viscosity of this report with those of references 1 and 15 to 17 for a pressure of 1 atmosphere. From this figure it is apparent that all the calculations are in substantial agreement up to 2000° K. Above 2000° K, references 15 to 17

obtained lower values than the present study by as much as approximately 13 percent up to the temperature limit of the calculations of these references for this pressure. The lower values of references 16 and 17 are due to the differences in the interaction potential used in the calculations. The difference between the values of this report and the lower values from reference 15 is due primarily to the less exact relations used in that report. Between 2000° and 3000° K, reference 1 and the values of this report are still in agreement. Between 3000° and 4500° K, values from reference 1 are slightly higher than those presented herein, and between 4500° and 10,000° K, reference 1 values are slightly lower. This difference probably occurs for the same reason that the thermal conductivity differs, that is, the difference in interaction potential assumed for the $H-H^1\Sigma$ interaction. However, for the temperatures calculated herein, the deviation between the values of this report and those of reference 1 is less than 8 percent.

Lewis Research Center
National Aeronautics and Space Administration
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APPENDIX A

SYMBOLS

A	constant in exponential potential
A^*, B^*, C^*	ratios of collision integrals that appear in expressions for transport coefficients of mixture (eq. 8.2-15, 16, and 17 of ref. 2)
C_p	molar heat capacity at constant pressure, cal/(mole)($^{\circ}$K)
D_{H-H}	self-diffusion coefficient of atomic hydrogen, cm^2/sec
D_{H-H_2}	binary-diffusion coefficient of mixture of hydrogen atoms and molecules, cm^2/sec
$D_{H_2-H_2}$	self-diffusion coefficient of molecular hydrogen, cm^2/sec
ΔH	heat of reaction, cal/mole
K_p	pressure-equilibrium constant, atm
k	Boltzmann constant
k_T	thermal-diffusion ratio, $\frac{\rho_1}{n^2 M_H M_{H_2}} \frac{D^T_{H-H}}{D_{H-H_2}}$ where D^T_{H-H} is thermal-diffusion coefficient of atomic hydrogen and ρ_1 is density
Le	Lewis number
l, n	dummy indexes in collision integral
M	molecular or atomic weight, g/mole
n	total number of moles present in gas
Pr	Prandtl number
p	pressure, atm
R	universal gas constant
r	intermolecular separation, A
r_m	r at potential-energy minimum, A

Sc	Schmidt number
s	steepness parameter for modified Buckingham potential
T	temperature, ^{o}K
x	mole fraction
α	ln (A/kT)
α_i	fraction of atoms ionized
β	degree of dissociation
ϵ	depth of modified Buckingham potential at minimum
η	viscosity of gaseous hydrogen, g/(cm)(sec)
λ	total thermal conductivity, cal/(cm)(sec)(^{o}K)
λ_f	frozen thermal conductivity, cal/(cm)(sec)(^{o}K)
λ_{int}	partial thermal conductivity due to internal degrees of freedom, cal/(cm)(sec)(^{o}K)
λ_{tr}	partial thermal conductivity due to translational degrees of freedom, cal/(cm)(sec)(^{o}K)
λ_R	partial thermal conductivity due to chemical reaction, cal/(cm)(sec)(^{o}K)
ρ	parameter in exponential potential, A $\left(\varphi(r) = Ae^{-r/\rho}\right)$
ρ_o	density
σ	collision diameter, A
φ	interaction potential between atomic particles
$\Omega^{(l,n)*}$	reduced collision integral in terms of which transport coefficients are expressed in eq. 8.2-14 of ref. 2

Subscripts:

e	equilibrium
f	chemically frozen, that is, quantity in absence of chemical reaction

H atomic hydrogen

H_2 molecular hydrogen

R due to chemical reaction

CONVERSION TABLE

Parameter	To convert from -	To	Multiply by
D	cm^2/sec	$in.^2/sec$	0.155
η	g/(cm)(sec)	lb/(ft)(sec) or centipoises	0.0672 100
λ	cal/(cm)(sec)(^oK)	(Btu)(ft)/(hr)(ft^2)(^oR) or (watt)(cm)/(cm^2)(^oK)	241.91 4.184

APPENDIX B

PROCEDURE FOR OBTAINING QUANTITIES IN TRANSPORT-PROPERTY EQUATIONS

The interaction potential energy enters the equation for the transport properties only through the quantities $\sigma^2\Omega^{(1,1)*}$, $\sigma^2\Omega^{(2,2)*}$, A^*, B^*, and C^*. For the modified Buckingham (6-exp) potential, the collision integral $\Omega^{(l,n)*}$ is obtained from table VII-B in the appendix of reference 2. For this potential, σ is the value of r at a potential minimum ($r_m = 3.337$ A for H_2).

For the exponential-repulsive potential, reference 9 has calculated and tabulated the integrals $I_{(l,n)}$ as a function of α. These integrals are related to $\sigma^2\Omega^{(l,n)*}$ through equation (21) of reference 9:

$$\sigma^2\Omega^{(l,n)*} = \frac{8\alpha^2\rho^2 I_{(l,n)}}{(n+1)!\left[1 - \frac{1}{2}\frac{1+(-1)^l}{1+l}\right]} \tag{B1}$$

where ρ is a constant (ρ is given in table I for the interactions considered here). The preceding equation was used to determine $\sigma^2\Omega^{(1,1)*}$ and $\sigma^2\Omega^{(2,2)*}$ where the exponential-repulsive potential is used.

For attractive potentials of interaction, the quantities $J_{(1,1)}$ and $J_{(2,2)}$ have been computed and are tabulated as functions of α (ref. 18). The $J_{(l,n)}$ quantities are related to $\sigma^2\Omega^{(l,n)*}$ through the relation (ref. 18)

$$\sigma^2\Omega^{(l,n)*} = \rho^2\alpha^2 J_{(l,n)} \tag{B2}$$

This equation is used when two hydrogen atoms interact along the attractive $^1\Sigma$ potential-energy curve.

For H-H interactions, it was stated previously that a probability exists for one out of every four H-H collisions to follow an attractive energy curve and for three to follow a repulsive energy curve. Reference 19 points out that the standard formulas for transport properties may be used provided that the collision integrals used are weighted according to the probability of the interaction. Therefore, the $\sigma^2\Omega^{(l,n)*}$ for H-H interactions was calculated by using both an exponential-repulsive potential and an exponential-attractive potential, and the weighted

average was used in the equations for the transport properties. The quantities $\sigma^2\Omega^{(1,1)*}$ and $\sigma^2\Omega^{(2,2)*}$ for all interactions are presented in figure 11.

The ratios of the collision integrals A^*, B^*, and C^* were taken from reference 9 for the repulsive potential and from reference 18 for the attractive potential and are tabulated in the respective references as a function of α.

The mole fraction of the species is related to the degree of dissociation β through the following relations:

$$x_H = \frac{2\beta}{1 + \beta} \tag{B3}$$

$$x_{H_2} = \frac{1 - \beta}{1 + \beta} \tag{B4}$$

which were used to calculate x_H and x_{H_2}. For temperatures up to 6000° K, β was calculated from the following equation (ref. 20):

$$\beta = \left(\frac{K_p}{4p + K_p}\right)^{1/2} \tag{B5}$$

where K_p is the equilibrium constant; its reciprocal is given in reference 21 for temperatures up to 6000° K. For temperatures above 6000° K, β was taken from reference 22. For all pressures calculated, β is presented in table III as a function of temperature.

For temperatures up to 6000° K, values of $\Delta H/RT$ were obtained from reference 21, and for temperatures above 6000° K, these values were calculated from Van't Hoff's isobar:

$$\frac{\Delta H}{RT^2} = \frac{d \ln K_p}{dT} \tag{B6}$$

The equilibrium constant was obtained by solving equation (B5) for K_p with values of β obtained from reference 22. From K_p, the derivative $d \ln K_p/dT$ was determined approximately by using temperature intervals of 200° K.

The computations of the molar heat capacity at constant pressure for molecular hydrogen C_{p,H_2} utilized an IBM 704 electronic-computer

program of the Pennington-Kobe method as outlined in reference 23, with a nonrigid rotator assumed. The spectroscopic constants for hydrogen were taken from reference 24, and the first four ionic excited states were used.

APPENDIX C

EQUATIONS FOR TRANSPORT PROPERTIES

The equation for viscosity (ref. 2, p. 530) is given as

$$\eta = \frac{1 + Z_\eta}{X_\eta + Y_\eta} \tag{C1}$$

where

$$X_\eta = \frac{x_H^2}{\eta_H} + \frac{2x_H x_{H_2}}{\eta_{H-H_2}} + \frac{x_{H_2}^2}{\eta_{H_2}} \tag{C2}$$

$$Y_\eta = \frac{3}{5} A^*_{H-H_2} \left(\frac{x_H^2}{2\eta_H} + \frac{9x_H x_{H_2}}{4} \frac{\eta_{H-H_2}}{\eta_H \eta_{H_2}} + \frac{2x_{H_2}^2}{\eta_{H_2}} \right) \tag{C3}$$

$$Z_\eta = \frac{3}{5} A^*_{H-H_2} \left\{ \frac{x_H^2}{2} + 2x_H x_{H_2} \left[\frac{9\eta_{H-H_2}}{8} \left(\frac{1}{\eta_H} + \frac{1}{\eta_{H_2}} \right) - 1 \right] + 2x_{H_2} \right\} \tag{C4}$$

$$\eta_H = 2.6693 \times 10^{-5} \frac{\sqrt{M_H T}}{\left[\sigma^2 \Omega(2,2)^*\right]_{H-H}} \tag{C5}$$

and η_{H_2} and η_{H-H_2} are obtained by changing M_H to M_{H_2} and $\frac{2M_H M_{H_2}}{M_H + M_{H_2}}$, respectively, and by changing $\left[\sigma^2 \Omega(2,2)^*\right]_{H-H}$ to $\left[\sigma^2 \Omega(2,2)^*\right]_{H_2-H_2}$ and $\left[\sigma^2 \Omega(2,2)^*\right]_{H-H_2}$, respectively, in equation (C5). The equation for thermal conductivity is

$$\lambda = \lambda_{tr} + \lambda_{int} + \lambda_R \tag{C6}$$

where the translational contribution λ_{tr} (ref. 2, p. 535) is given by

$$\lambda_{tr} = \frac{1 + Z_\lambda}{X_\lambda + Y_\lambda} \tag{C7}$$

where

$$X_\lambda = \frac{x_H^2}{\lambda_H} + \frac{2x_H x_{H_2}}{\lambda_{H-H_2}} + \frac{x_{H_2}^2}{\lambda_{H_2}} \tag{C8}$$

$$Y_\lambda = \frac{x_H^2}{\lambda_H} U^{(1)} + \frac{2x_H x_{H_2}}{\lambda_{H-H_2}} U^{(Y)} + \frac{x_{H_2}^2}{\lambda_{H_2}} U^{(2)} \tag{C9}$$

$$Z_\lambda = x_H^2 U^{(1)} + 2x_H x_{H_2} U^{(Z)} + x_{H_2}^2 U^{(2)} \tag{C10}$$

The quantity

$$U^{(1)} = \frac{4}{15} A^*_{H-H_2} - \frac{1}{12}\left(\frac{12}{5} B^*_{H-H_2} + 1\right)\frac{M_H}{M_{H_2}} + \frac{1}{2}\frac{\left(M_H - M_{H_2}\right)^2}{M_H M_{H_2}} \tag{C11}$$

and $U^{(2)}$ is found by changing M_H to M_{H_2} and M_{H_2} to M_H in the equation for $U^{(1)}$.

Further,

$$U^{(Y)} = \frac{3}{10} A^*_{H-H_2} \frac{\lambda_{H-H_2}^2}{\lambda_H \lambda_{H_2}} - \frac{1}{12}\left(\frac{12}{5} B^*_{H-H_2} + 1\right) - \frac{5}{64 A^*_{H-H_2}}\left(\frac{12}{5} B^*_{H-H_2} - 5\right) \tag{C12}$$

$$U^{(Z)} = \frac{4}{15} A^*_{H-H_2}\left[\frac{9\lambda_{H-H_2}}{8}\left(\frac{1}{\lambda_H} + \frac{1}{\lambda_{H_2}}\right) - 1\right] - \frac{1}{12}\left(\frac{12}{5} B^*_{H-H_2} + 1\right) \tag{C13}$$

$$\lambda_H = 1.9891\times10^{-4} \frac{\sqrt{T/M_H}}{\left[\sigma^2\Omega(2,2)^*\right]_{H-H}} \tag{C14}$$

and

λ_{H_2} and λ_{H-H_2} are found by changing M_H to M_{H_2} and $\frac{2M_HM_{H_2}}{M_H + M_{H_2}}$, respectively, and by changing $\left[\sigma^2\Omega(2,2)^*\right]_{H-H}$ to $\left[\sigma^2\Omega(2,2)^*\right]_{H_2-H_2}$ and $\left[\sigma^2\Omega(2,2)^*\right]_{H-H_2}$, respectively, in equation (C14).

The chemical-reaction contribution λ_R (ref. 14) is

$$\lambda_R = \frac{pD_{H-H_2}}{2T}\left(\frac{\Delta H}{RT}\right)^2\beta(1 - \beta) \tag{C15}$$

the internal energy contribution λ_{int} (ref. 13) is

$$\lambda_{int} = \frac{pD_{H_2-H_2}\left(C_{p,H_2} - \frac{5}{2}R\right)}{RT\left(1 + \frac{x_H}{x_{H_2}}\frac{D_{H_2-H_2}}{D_{H-H_2}}\right)} \tag{C16}$$

and the diffusion coefficient (ref. 2, p. 539) is

$$D_{H-H} = 0.002628 \frac{\sqrt{T^3/M_H}}{p\left[\sigma^2\Omega(1,1)^*\right]_{H-H}} \tag{C17}$$

Then $D_{H_2-H_2}$ and D_{H-H_2} are found by replacing M_H with M_{H_2} and $\frac{2M_HM_{H_2}}{M_H + M_{H_2}}$, respectively, and by replacing $\left[\sigma^2\Omega(1,1)^*\right]_{H-H}$ with $\left[\sigma^2\Omega(1,1)^*\right]_{H_2-H_2}$ and $\left[\sigma^2\Omega(1,1)^*\right]_{H-H_2}$, respectively, in equation (C17).

The thermal diffusion ratio (ref. 2, p. 541) is

$$k_T = \frac{x_H x_{H_2}}{6\lambda_{H-H_2}} \left[\frac{x_H S^{(1)} - x_{H_2} S^{(2)}}{X_\lambda + Y_\lambda} \right] (6C^*_{H-H_2} - 5) \tag{C18}$$

where

$$S^{(1)} = \frac{M_H + M_{H_2}}{2M_{H_2}} \frac{\lambda_{H-H_2}}{\lambda_H} - \frac{15}{4A^*_{H-H_2}} \left(\frac{M_{H_2} - M_H}{2M_H} \right) - 1 \tag{C19}$$

The quantity $S^{(2)}$ is found by interchanging M_H and M_{H_2}, and by replacing λ_H with λ_{H_2} in equation (C19); X_λ and Y_λ are given by equations (C8) and (C9), respectively, and λ_H, λ_{H_2}, and λ_{H-H_2} are obtained from equation (C14).

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TABLE I. - INTERACTION POTENTIALS

Interaction	Parameters for exponential potential, $\varphi(r) = Ae^{-r/p}$		Temperature range, T	Reference	Parameters for modified Buckingham (exp-6) potential, $\varphi(r) = \frac{\epsilon}{1 + \frac{6}{s}}\left\{\frac{6}{s}\exp\left[s\left(1 - \frac{r}{r_m}\right)\right] - \left(\frac{r_m}{r}\right)^6\right\}$			Temperature range, T	Reference
	A/k	ρ, A			r_m, A	ϵ/k	s		
$H-H^1\Sigma$	-9.29×10^5	0.3922	All temperatures	[a]12	-----	----	----	----------	---
$H-H^3\Sigma$	7.01×10^5	.3319	All temperatures	11	-----	----	----	----------	---
$H-H_2$	7.13×10^5	.3388	All temperatures	10	-----	----	----	----------	---
H_2-H_2	1.35×10^6	.3499	High temperature	10	3.337	37.3	14	Low temperature	2

[a]Curves fitted to values given in reference.

TABLE II. - TRANSPORT PROPERTIES OF PURE ATOMIC AND PURE MOLECULAR HYDROGEN

[E-03, E-04, E-05 denote exponents 10^{-3}, 10^{-4}, 10^{-5}, respectively.]

Temperature, T, °K	Viscosity, η, g/(cm)(sec)			Thermal conductivity, λ, cal/(cm)(sec)(°K)		
	η_H	η_{H_2}	η_{H-H_2}	λ_H	λ_{H_2}	λ_{H-H_2}
300	5.811E-05	8.943E-05	7.853E-05	4.296E-04	3.306E-04	4.354E-04
500	8.558E-05	1.256E-04	1.105E-04	6.327E-04	4.641E-04	6.129E-04
700	1.110E-04	1.573E-04	1.423E-04	8.208E-04	5.814E-04	7.888E-04
1000	1.470E-04	1.999E-04	1.898E-04	1.087E-03	7.390E-04	1.053E-03
1200	1.700E-04	2.260E-04	2.210E-04	1.257E-03	8.353E-04	1.225E-03
1400	1.926E-04	2.512E-04	2.514E-04	1.424E-03	9.286E-04	1.394E-03
1600	2.146E-04	2.754E-04	2.804E-04	1.587E-03	1.018E-03	1.554E-03
1800	2.364E-04	2.994E-04	3.093E-04	1.748E-03	1.107E-03	1.715E-03
2000	2.580E-04	3.228E-04	3.380E-04	1.907E-03	1.193E-03	1.874E-03
2200	2.792E-04	3.462E-04	3.665E-04	2.064E-03	1.280E-03	2.032E-03
2400	3.003E-04	3.699E-04	3.953E-04	2.220E-03	1.367E-03	2.192E-03
2600	3.213E-04	3.928E-04	4.230E-04	2.375E-03	1.452E-03	2.345E-03
2800	3.421E-04	4.165E-04	4.511E-04	2.529E-03	1.540E-03	2.501E-03
3000	3.628E-04	4.393E-04	4.788E-04	2.682E-03	1.624E-03	2.655E-03
3200	3.833E-04	4.631E-04	5.067E-04	2.834E-03	1.712E-03	2.809E-03
3400	4.038E-04	4.868E-04	5.339E-04	2.985E-03	1.799E-03	2.960E-03
3600	4.243E-04	5.099E-04	5.609E-04	3.136E-03	1.885E-03	3.110E-03
3800	4.445E-04	5.340E-04	5.888E-04	3.286E-03	1.974E-03	3.264E-03
4000	4.649E-04	5.581E-04	6.174E-04	3.437E-03	2.063E-03	3.423E-03
4200	4.851E-04	5.807E-04	6.449E-04	3.586E-03	2.146E-03	3.575E-03
4400	5.055E-04	6.051E-04	6.719E-04	3.737E-03	2.236E-03	3.725E-03
4600	5.256E-04	6.293E-04	6.996E-04	3.885E-03	2.326E-03	3.879E-03
4800	5.457E-04	6.532E-04	7.268E-04	4.034E-03	2.414E-03	4.030E-03
5000	5.657E-04	6.759E-04	7.545E-04	4.182E-03	2.498E-03	4.184E-03
5200	5.859E-04	6.999E-04	7.816E-04	4.331E-03	2.587E-03	4.334E-03
5400	6.061E-04	7.243E-04	8.093E-04	4.481E-03	2.677E-03	4.487E-03
5600	6.262E-04	7.474E-04	8.375E-04	4.629E-03	2.762E-03	4.644E-03
5800	6.461E-04	7.707E-04	8.649E-04	4.777E-03	2.849E-03	4.795E-03
6000	6.663E-04	7.934E-04	8.927E-04	4.926E-03	2.933E-03	4.950E-03
6200	6.864E-04	8.165E-04	9.195E-04	5.074E-03	3.018E-03	5.098E-03
6400	7.065E-04	8.399E-04	9.467E-04	5.223E-03	3.105E-03	5.249E-03
6600	7.266E-04	8.625E-04	9.744E-04	5.372E-03	3.188E-03	5.403E-03
6800	7.466E-04	8.854E-04	1.003E-03	5.519E-03	3.273E-03	5.559E-03
7000	7.668E-04	9.086E-04	1.029E-03	5.669E-03	3.358E-03	5.708E-03
7200	7.867E-04	9.308E-04	1.057E-03	5.816E-03	3.441E-03	5.859E-03
7400	8.069E-04	9.533E-04	1.084E-03	5.965E-03	3.524E-03	6.012E-03
7600	8.270E-04	9.775E-04	1.115E-03	6.114E-03	3.613E-03	6.181E-03
7800	8.472E-04	1.001E-03	1.144E-03	6.263E-03	3.699E-03	6.340E-03
8000	8.673E-04	1.024E-03	1.170E-03	6.412E-03	3.786E-03	6.489E-03
8200	8.874E-04	1.046E-03	1.200E-03	6.560E-03	3.868E-03	6.654E-03
8400	9.076E-04	1.070E-03	1.230E-03	6.709E-03	3.957E-03	6.822E-03
8600	9.278E-04	1.095E-03	1.259E-03	6.859E-03	4.047E-03	6.979E-03
8800	9.480E-04	1.120E-03	1.290E-03	7.009E-03	4.139E-03	7.153E-03
9000	9.684E-04	1.143E-03	1.319E-03	7.159E-03	4.226E-03	7.316E-03
9200	9.884E-04	1.167E-03	1.352E-03	7.307E-03	4.314E-03	7.497E-03
9400	1.009E-03	1.193E-03	1.383E-03	7.458E-03	4.410E-03	7.666E-03
9600	1.029E-03	1.220E-03	1.414E-03	7.609E-03	4.508E-03	7.837E-03
9800	1.049E-03	1.244E-03	1.445E-03	7.759E-03	4.600E-03	8.012E-03
10000	1.070E-03	1.270E-03	1.477E-03	7.909E-03	4.693E-03	8.190E-03

TABLE III. - TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(a) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	1.137E-07	2.274E-07	7.390E-04	3.083E-04	1.047E-03	6.728E-08	1.047E-03	1.999E-04
1200	9.874E-06	1.975E-05	8.353E-04	3.803E-04	1.216E-03	4.786E-06	1.220E-03	2.260E-04
1400	2.429E-04	4.857E-04	9.289E-04	4.624E-04	1.391E-03	9.972E-05	1.491E-03	2.512E-04
1600	2.717E-03	5.418E-03	1.022E-03	5.500E-04	1.572E-03	9.635E-04	2.536E-03	2.755E-04
1800	1.789E-02	3.514E-02	1.140E-03	6.308E-04	1.771E-03	5.492E-03	7.263E-03	3.006E-04
2000	8.096E-02	1.498E-01	1.348E-03	6.699E-04	2.018E-03	2.082E-02	2.284E-02	3.270E-04
2200	2.706E-01	4.260E-01	1.722E-03	5.800E-04	2.302E-03	4.993E-02	5.224E-02	3.445E-04
2400	6.217E-01	7.667E-01	2.115E-03	3.148E-04	2.430E-03	5.432E-02	5.675E-02	3.335E-04
2600	8.864E-01	9.398E-01	2.353E-03	9.981E-05	2.453E-03	2.136E-02	2.381E-02	3.306E-04
2800	9.712E-01	9.854E-01	2.524E-03	2.739E-05	2.551E-03	5.483E-03	8.034E-03	3.445E-04
3000	9.920E-01	9.960E-01	2.681E-03	8.240E-06	2.689E-03	1.442E-03	4.131E-03	3.635E-04
3200	9.975E-01	9.987E-01	2.833E-03	2.842E-06	2.836E-03	4.315E-04	3.267E-03	3.835E-04
3400	9.991E-01	9.995E-01	2.985E-03	1.109E-06	2.986E-03	1.469E-04	3.133E-03	4.039E-04
3600	9.996E-01	9.998E-01	3.136E-03	4.752E-07	3.137E-03	5.535E-05	3.192E-03	4.243E-04
3800	9.998E-01	9.999E-01	3.286E-03	2.274E-07	3.286E-03	2.345E-05	3.310E-03	4.446E-04
4000	9.999E-01	1.000E-00	3.437E-03	1.167E-07	3.437E-03	1.072E-05	3.448E-03	4.649E-04
4200	1.000E-00	1.000E-00	3.586E-03	6.361E-08	3.586E-03	5.240E-06	3.592E-03	4.851E-04
4400	1.000E-00	1.000E-00	3.737E-03	3.690E-08	3.737E-03	2.739E-06	3.739E-03	5.055E-04
4600	1.000E-00	1.000E-00	3.885E-03	2.247E-08	3.885E-03	1.509E-06	3.887E-03	5.256E-04
4800	1.000E-00	1.000E-00	4.034E-03	1.422E-08	4.034E-03	8.682E-07	4.035E-03	5.457E-04
5000	1.000E-00	1.000E-00	4.182E-03	9.364E-09	4.182E-03	5.218E-07	4.183E-03	5.657E-04
5200	1.000E-00	1.000E-00	4.331E-03	6.408E-09	4.332E-03	3.269E-07	4.332E-03	5.859E-04
5400	1.000E-00	1.000E-00	4.481E-03	4.513E-09	4.481E-03	2.115E-07	4.481E-03	6.061E-04
5600	1.000E-00	1.000E-00	4.629E-03	3.252E-09	4.629E-03	1.404E-07	4.629E-03	6.262E-04
5800	1.000E-00	1.000E-00	4.777E-03	2.418E-09	4.777E-03	9.642E-08	4.777E-03	6.462E-04
6000	1.000E-00	1.000E-00	4.926E-03	1.820E-09	4.926E-03	6.721E-08	4.926E-03	6.663E-04
6200	1.000E-00	1.000E-00	5.074E-03	1.373E-09	5.074E-03	4.812E-08	5.074E-03	6.864E-04
6400	1.000E-00	1.000E-00	5.223E-03	1.061E-09	5.223E-03	3.504E-08	5.223E-03	7.065E-04
6600	1.000E-00	1.000E-00	5.372E-03	8.417E-10	5.372E-03	2.635E-08	5.372E-03	7.266E-04
6800	1.000E-00	1.000E-00	5.519E-03	6.851E-10	5.519E-03	2.041E-08	5.519E-03	7.466E-04
7000	1.000E-00	1.000E-00	5.669E-03	5.603E-10	5.669E-03	1.599E-08	5.669E-03	7.668E-04
7200	1.000E-00	1.000E-00	5.816E-03	4.683E-10	5.816E-03	1.283E-08	5.816E-03	7.867E-04
7400	1.000E-00	1.000E-00	5.965E-03	3.933E-10	5.965E-03	1.031E-08	5.965E-03	8.069E-04
7600	1.000E-00	1.000E-00	6.114E-03	3.350E-10	6.114E-03	8.439E-09	6.114E-03	8.270E-04
7800	1.000E-00	1.000E-00	6.263E-03	2.977E-10	6.263E-03	7.243E-09	6.263E-03	8.472E-04
8000	1.000E-00	1.000E-00	6.412E-03	2.558E-10	6.412E-03	6.023E-09	6.412E-03	8.673E-04
8200	1.000E-00	1.000E-00	6.560E-03	2.379E-10	6.560E-03	5.422E-09	6.560E-03	8.874E-04
8400	1.000E-00	1.000E-00	6.709E-03	2.185E-10	6.709E-03	4.818E-09	6.709E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	1.693E-10	6.859E-03	3.611E-09	6.859E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	1.749E-10	7.009E-03	3.617E-09	7.009E-03	9.480E-04
9000	1.000E-00	1.000E-00	7.159E-03	1.506E-10	7.159E-03	3.026E-09	7.159E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	1.241E-10	7.307E-03	2.423E-09	7.307E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	1.281E-10	7.458E-03	2.431E-09	7.458E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	1.319E-10	7.609E-03	2.926E-09	7.609E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	1.022E-10	7.759E-03	1.834E-09	7.759E-03	1.049E-03
10000	1.000E-00	1.000E-00	7.909E-03	1.053E-10	7.909E-03	1.844E-09	7.909E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^{-4} atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,H}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E 04	2.090E 04	1.480E 04	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E 04	4.945E 04	3.490E 04	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E 04	8.933E 04	6.165E 04	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E 05	1.711E 05	1.124E 05	-1.872E-08	3.227E-04	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E 05	2.398E 05	1.537E 05	-1.560E-06	1.966E-02	7.424E 00	6.819E-01	6.828E-01	1.483E 00	4.603E-01
3.027E 05	3.196E 05	2.012E 05	-3.566E-05	3.584E-01	7.967E 00	6.660E-01	6.816E-01	1.522E 00	4.480E-01
3.860E 05	4.098E 05	2.547E 05	-3.810E-04	3.087E 00	1.088E 01	5.882E-01	6.795E-01	1.548E 00	4.391E-01
4.789E 05	5.092E 05	3.141E 05	-2.250E-03	1.593E 01	2.383E 01	4.979E-01	6.766E-01	1.537E 00	4.403E-01
5.810E 05	6.210E 05	3.801E 05	-8.125E-03	5.503E 01	6.272E 01	4.816E-01	6.686E-01	1.443E 00	4.634E-01
6.924E 05	7.426E 05	4.531E 05	-1.414E-02	1.214E 02	1.283E 02	5.333E-01	6.503E-01	1.232E 00	5.279E-01
8.128E 05	8.753E 05	5.321E 05	-9.536E-03	1.222E 02	1.280E 02	6.051E-01	6.385E-01	1.058E 00	6.036E-01
9.426E 05	1.017E 06	6.165E 05	-2.725E-03	4.480E 01	4.999E 01	6.495E-01	6.540E-01	1.008E 00	6.490E-01
1.081E 06	1.170E 06	7.077E 05	-6.556E-04	1.076E 01	1.579E 01	6.619E-01	6.631E-01	1.003E 00	6.613E-01
1.230E 06	1.333E 06	8.035E 05	-1.707E-04	2.663E 00	7.646E 00	6.649E-01	6.656E-01	1.003E 00	6.635E-01
1.387E 06	1.506E 06	9.055E 05	-5.179E-05	7.525E-01	5.725E 00	6.658E-01	6.663E-01	1.005E 00	6.627E-01
1.552E 06	1.690E 06	1.014E 06	-1.760E-05	2.427E-01	5.212E 00	6.663E-01	6.665E-01	1.008E 00	6.614E-01
1.728E 06	1.883E 06	1.128E 06	-6.908E-06	8.683E-02	5.055E 00	6.665E-01	6.666E-01	1.010E 00	6.602E-01
1.912E 06	2.086E 06	1.246E 06	-2.885E-06	3.505E-02	5.003E 00	6.665E-01	6.666E-01	1.011E 00	6.591E-01
2.105E 06	2.308E 06	1.369E 06	-1.308E-06	1.525E-02	4.983E 00	6.666E-01	6.666E-01	1.016E 00	6.560E-01
2.307E 06	2.529E 06	1.502E 06	-6.228E-07	7.141E-03	4.975E 00	6.666E-01	6.666E-01	1.016E 00	6.559E-01
2.518E 06	2.774E 06	1.639E 06	-3.268E-07	3.565E-03	4.971E 00	6.666E-01	6.666E-01	1.021E 00	6.527E-01
2.738E 06	3.016E 06	1.782E 06	-1.768E-07	1.889E-03	4.969E 00	6.666E-01	6.666E-01	1.021E 00	6.526E-01
2.968E 06	3.278E 06	1.930E 06	-1.036E-07	1.043E-03	4.969E 00	6.666E-01	6.666E-01	1.025E 00	6.505E-01
3.206E 06	3.546E 06	2.084E 06	-5.894E-08	6.037E-04	4.968E 00	6.666E-01	6.666E-01	1.027E 00	6.493E-01
3.454E 06	3.820E 06	2.246E 06	-3.562E-08	3.652E-04	4.968E 00	6.666E-01	6.666E-01	1.027E 00	6.493E-01
3.709E 06	4.117E 06	2.412E 06	-2.260E-08	2.277E-04	4.968E 00	6.666E-01	6.666E-01	1.030E 00	6.472E-01
3.974E 06	4.418E 06	2.581E 06	-1.466E-08	1.460E-04	4.968E 00	6.666E-01	6.666E-01	1.032E 00	6.461E-01
4.249E 06	4.734E 06	2.762E 06	-9.798E-09	9.693E-05	4.968E 00	6.666E-01	6.666E-01	1.034E 00	6.444E-01
4.535E 06	5.053E 06	2.941E 06	-6.618E-09	6.549E-05	4.968E 00	6.666E-01	6.666E-01	1.035E 00	6.441E-01
4.824E 06	5.385E 06	3.132E 06	-4.306E-09	4.547E-05	4.968E 00	6.666E-01	6.666E-01	1.036E 00	6.433E-01
5.125E 06	5.732E 06	3.331E 06	-2.954E-09	3.211E-05	4.968E 00	6.666E-01	6.666E-01	1.038E 00	6.422E-01
5.435E 06	6.093E 06	3.538E 06	-2.067E-09	2.343E-05	4.968E 00	6.666E-01	6.666E-01	1.040E 00	6.408E-01
5.755E 06	6.452E 06	3.747E 06	-1.473E-09	1.765E-05	4.968E 00	6.666E-01	6.666E-01	1.041E 00	6.405E-01
6.084E 06	6.843E 06	3.963E 06	-9.891E-10	1.342E-05	4.968E 00	6.666E-01	6.666E-01	1.044E 00	6.385E-01
6.418E 06	7.232E 06	4.196E 06	-7.521E-10	1.048E-05	4.968E 00	6.666E-01	6.666E-01	1.045E 00	6.376E-01
6.766E 06	7.655E 06	4.421E 06	-5.706E-10	8.176E-06	4.968E 00	6.666E-01	6.666E-01	1.050E 00	6.350E-01
7.124E 06	8.075E 06	4.663E 06	-3.762E-10	6.518E-06	4.968E 00	6.666E-01	6.666E-01	1.052E 00	6.337E-01
7.488E 06	8.533E 06	4.895E 06	-2.694E-10	5.433E-06	4.968E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
7.860E 06	8.962E 06	5.143E 06	-1.809E-10	4.412E-06	4.968E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
8.243E 06	9.430E 06	5.400E 06	-1.233E-10	3.869E-06	4.968E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
8.634E 06	9.916E 06	5.666E 06	-7.468E-11	3.349E-06	4.968E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
9.034E 06	1.042E 07	5.928E 06	-3.010E-11	2.446E-06	4.968E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
9.445E 06	1.094E 07	6.199E 06	-1.711E-11	2.387E-06	4.968E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
9.870E 06	1.149E 07	6.490E 06	-3.557E-12	1.946E-06	4.968E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
1.029E 07	1.201E 07	6.763E 06	1.413E-11	1.522E-06	4.968E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
1.073E 07	1.260E 07	7.058E 06	3.099E-11	1.489E-06	4.968E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
1.118E 07	1.316E 07	7.361E 06	4.770E-11	1.751E-06	4.968E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
1.164E 07	1.379E 07	7.674E 06	4.820E-11	1.070E-06	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
1.210E 07	1.439E 07	7.995E 06	5.425E-11	1.051E-06	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.052E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(b) Pressure,

Temperature, T, °K	Degree of dissociation, ξ	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	6.393E-08	1.279E-07	7.390E-04	3.083E-04	1.047E-03	3.783E-08	1.047E-03	1.999E-04
1200	5.553E-06	1.111E-05	8.353E-04	3.803E-04	1.216E-03	2.692E-06	1.218E-03	2.260E-04
1400	1.366E-04	2.731E-04	9.288E-04	4.624E-04	1.391E-03	5.608E-05	1.447E-03	2.512E-04
1600	1.528E-03	3.051E-03	1.020E-03	5.508E-04	1.571E-03	5.425E-04	2.114E-03	2.755E-04
1800	1.006E-02	1.992E-02	1.126E-03	6.370E-04	1.763E-03	3.113E-03	4.876E-03	3.001E-04
2000	4.563E-02	8.727E-02	1.285E-03	7.012E-04	1.986E-03	1.219E-02	1.417E-02	3.260E-04
2200	1.561E-01	2.701E-01	1.576E-03	6.874E-04	2.264E-03	3.333E-02	3.560E-02	3.513E-04
2400	4.076E-01	5.791E-01	1.985E-03	5.139E-04	2.499E-03	5.577E-02	5.827E-02	3.566E-04
2600	7.328E-01	8.458E-01	2.308E-03	2.414E-04	2.550E-03	4.154E-02	4.409E-02	3.450E-04
2800	9.167E-01	9.565E-01	2.512E-03	8.011E-05	2.592E-03	1.499E-02	1.759E-02	3.492E-04
3000	9.755E-01	9.876E-01	2.678E-03	2.548E-05	2.703E-03	4.371E-03	7.074E-03	3.650E-04
3200	9.920E-01	9.960E-01	2.832E-03	8.921E-06	2.841E-03	1.346E-03	4.187E-03	3.840E-04
3400	9.971E-01	9.985E-01	2.985E-03	3.497E-06	2.988E-03	4.624E-04	3.450E-03	4.041E-04
3600	9.988E-01	9.994E-01	3.136E-03	1.501E-06	3.138E-03	1.747E-04	3.312E-03	4.244E-04
3800	9.995E-01	9.997E-01	3.286E-03	7.188E-07	3.287E-03	7.410E-05	3.361E-03	4.446E-04
4000	9.997E-01	9.999E-01	3.437E-03	3.689E-07	3.437E-03	3.390E-05	3.471E-03	4.649E-04
4200	9.999E-01	9.999E-01	3.586E-03	2.011E-07	3.586E-03	1.657E-05	3.603E-03	4.851E-04
4400	9.999E-01	1.000E-00	3.737E-03	1.167E-07	3.737E-03	8.659E-06	3.745E-03	5.055E-04
4600	1.000E-00	1.000E-00	3.885E-03	7.101E-08	3.885E-03	4.770E-06	3.890E-03	5.256E-04
4800	1.000E-00	1.000E-00	4.034E-03	4.495E-08	4.034E-03	2.745E-06	4.037E-03	5.457E-04
5000	1.000E-00	1.000E-00	4.182E-03	2.963E-08	4.182E-03	1.651E-06	4.184E-03	5.657E-04
5200	1.000E-00	1.000E-00	4.331E-03	2.023E-08	4.332E-03	1.032E-06	4.333E-03	5.859E-04
5400	1.000E-00	1.000E-00	4.481E-03	1.425E-08	4.481E-03	6.677E-07	4.481E-03	6.061E-04
5600	1.000E-00	1.000E-00	4.629E-03	1.028E-08	4.629E-03	4.440E-07	4.629E-03	6.262E-04
5800	1.000E-00	1.000E-00	4.777E-03	7.613E-09	4.777E-03	3.036E-07	4.777E-03	6.462E-04
6000	1.000E-00	1.000E-00	4.926E-03	5.746E-09	4.926E-03	2.122E-07	4.926E-03	6.663E-04
6200	1.000E-00	1.000E-00	5.074E-03	4.324E-09	5.074E-03	1.515E-07	5.074E-03	6.864E-04
6400	1.000E-00	1.000E-00	5.223E-03	3.357E-09	5.223E-03	1.109E-07	5.223E-03	7.065E-04
6600	1.000E-00	1.000E-00	5.372E-03	2.645E-09	5.372E-03	8.282E-08	5.372E-03	7.266E-04
6800	1.000E-00	1.000E-00	5.519E-03	2.117E-09	5.519E-03	6.309E-08	5.519E-03	7.466E-04
7000	1.000E-00	1.000E-00	5.669E-03	1.724E-09	5.669E-03	4.920E-08	5.669E-03	7.668E-04
7200	1.000E-00	1.000E-00	5.816E-03	1.427E-09	5.816E-03	3.909E-08	5.816E-03	7.867E-04
7400	1.000E-00	1.000E-00	5.965E-03	1.203E-09	5.965E-03	3.153E-08	5.965E-03	8.069E-04
7600	1.000E-00	1.000E-00	6.114E-03	1.029E-09	6.114E-03	2.592E-08	6.114E-03	8.270E-04
7800	1.000E-00	1.000E-00	6.263E-03	8.931E-10	6.263E-03	2.173E-08	6.263E-03	8.472E-04
8000	1.000E-00	1.000E-00	6.412E-03	7.673E-10	6.412E-03	1.807E-08	6.412E-03	8.673E-04
8200	1.000E-00	1.000E-00	6.560E-03	6.873E-10	6.560E-03	1.566E-08	6.560E-03	8.874E-04
8400	1.000E-00	1.000E-00	6.709E-03	6.009E-10	6.709E-03	1.325E-08	6.709E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	5.362E-10	6.859E-03	1.143E-08	6.859E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	4.664E-10	7.009E-03	9.645E-09	7.009E-03	9.480E-04
9000	1.000E-00	1.000E-00	7.159E-03	4.216E-10	7.159E-03	8.473E-09	7.159E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	4.032E-10	7.307E-03	7.874E-09	7.307E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	3.524E-10	7.458E-03	6.685E-09	7.458E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	3.299E-10	7.609E-03	7.315E-09	7.609E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	3.066E-10	7.759E-03	5.502E-09	7.759E-03	1.049E-03
10000	1.000E-00	1.000E-00	7.909E-03	2.807E-10	7.909E-03	4.917E-09	7.909E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

$10^{-3.5}$ atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
6.105E 03	6.610E 03	4.679E 03	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
1.505E 04	1.564E 04	1.104E 04	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
2.742E 04	2.825E 04	1.950E 04	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
5.205E 04	5.410E 04	3.556E 04	-1.053E-08	1.815E-04	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
7.238E 04	7.582E 04	4.861E 04	-8.774E-07	1.105E-02	7.415E 00	6.823E-01	6.828E-01	1.483E 00	4.603E-01
9.572E 04	1.011E 05	6.361E 04	-2.006E-05	2.016E-01	7.811E 00	6.726E-01	6.817E-01	1.522E 00	4.479E-01
1.221E 05	1.296E 05	8.056E 04	-2.151E-04	1.738E 00	9.542E 00	6.178E-01	6.797E-01	1.550E 00	4.384E-01
1.514E 05	1.610E 05	9.933E 04	-1.297E-03	9.031E 00	1.697E 01	5.234E-01	6.774E-01	1.553E 00	4.362E-01
1.837E 05	1.964E 05	1.202E 05	-5.106E-03	3.221E 01	4.010E 01	4.784E-01	6.719E-01	1.504E 00	4.468E-01
2.190E 05	2.348E 05	1.433E 05	-1.161E-02	8.104E 01	8.845E 01	5.006E-01	6.601E-01	1.348E 00	4.897E-01
2.570E 05	2.768E 05	1.683E 05	-1.344E-02	1.255E 02	1.319E 02	5.637E-01	6.413E-01	1.145E 00	5.602E-01
2.981E 05	3.216E 05	1.950E 05	-6.416E-03	8.714E 01	9.266E 01	6.233E-01	6.425E-01	1.033E 00	6.221E-01
3.420E 05	3.701E 05	2.238E 05	-1.910E-03	2.944E 01	3.457E 01	6.527E-01	6.570E-01	1.008E 00	6.519E-01
3.890E 05	4.214E 05	2.541E 05	-5.274E-04	8.074E 00	1.309E 01	6.618E-01	6.636E-01	1.004E 00	6.607E-01
4.385E 05	4.762E 05	2.864E 05	-1.625E-04	2.347E 00	7.330E 00	6.644E-01	6.656E-01	1.006E 00	6.617E-01
4.908E 05	5.343E 05	3.205E 05	-5.551E-05	7.635E-01	5.737E 00	6.655E-01	6.662E-01	1.008E 00	6.610E-01
5.464E 05	5.955E 05	3.566E 05	-2.182E-05	2.740E-01	5.244E 00	6.661E-01	6.665E-01	1.010E 00	6.601E-01
6.046E 05	6.598E 05	3.940E 05	-9.117E-06	1.107E-01	5.079E 00	6.664E-01	6.666E-01	1.011E 00	6.590E-01
6.656E 05	7.298E 05	4.330E 05	-4.136E-06	4.821E-02	5.016E 00	6.665E-01	6.666E-01	1.016E 00	6.559E-01
7.296E 05	7.997E 05	4.749E 05	-1.969E-06	2.258E-02	4.990E 00	6.666E-01	6.666E-01	1.016E 00	6.559E-01
7.962E 05	8.772E 05	5.184E 05	-1.033E-06	1.127E-02	4.979E 00	6.666E-01	6.666E-01	1.021E 00	6.527E-01
8.659E 05	9.537E 05	5.636E 05	-5.587E-07	5.970E-03	4.974E 00	6.666E-01	6.666E-01	1.022E 00	6.526E-01
9.386E 05	1.036E 06	6.102E 05	-3.275E-07	3.298E-03	4.971E 00	6.666E-01	6.666E-01	1.025E 00	6.505E-01
1.014E 06	1.121E 06	6.590E 05	-1.865E-07	1.910E-03	4.969E 00	6.666E-01	6.666E-01	1.027E 00	6.493E-01
1.092E 06	1.208E 06	7.103E 05	-1.125E-07	1.153E-03	4.969E 00	6.666E-01	6.666E-01	1.027E 00	6.492E-01
1.173E 06	1.302E 06	7.627E 05	-7.136E-08	7.187E-04	4.968E 00	6.666E-01	6.666E-01	1.030E 00	6.472E-01
1.257E 06	1.397E 06	8.162E 05	-4.636E-08	4.617E-04	4.968E 00	6.666E-01	6.666E-01	1.032E 00	6.461E-01
1.344E 06	1.497E 06	8.734E 05	-3.085E-08	3.052E-04	4.968E 00	6.666E-01	6.666E-01	1.034E 00	6.444E-01
1.434E 06	1.598E 06	9.300E 05	-2.089E-08	2.068E-04	4.968E 00	6.666E-01	6.666E-01	1.035E 00	6.441E-01
1.526E 06	1.703E 06	9.904E 05	-1.356E-08	1.432E-04	4.968E 00	6.666E-01	6.666E-01	1.036E 00	6.433E-01
1.621E 06	1.812E 06	1.053E 06	-9.346E-09	1.016E-04	4.968E 00	6.666E-01	6.666E-01	1.038E 00	6.422E-01
1.719E 06	1.927E 06	1.119E 06	-6.495E-09	7.363E-05	4.968E 00	6.666E-01	6.666E-01	1.040E 00	6.408E-01
1.820E 06	2.040E 06	1.185E 06	-4.554E-09	5.456E-05	4.968E 00	6.666E-01	6.666E-01	1.041E 00	6.405E-01
1.924E 06	2.164E 06	1.253E 06	-3.043E-09	4.129E-05	4.968E 00	6.666E-01	6.666E-01	1.044E 00	6.385E-01
2.030E 06	2.287E 06	1.327E 06	-2.292E-09	3.194E-05	4.968E 00	6.666E-01	6.666E-01	1.045E 00	6.376E-01
2.139E 06	2.421E 06	1.398E 06	-1.745E-09	2.501E-05	4.968E 00	6.666E-01	6.666E-01	1.050E 00	6.350E-01
2.253E 06	2.553E 06	1.474E 06	-1.155E-09	2.002E-05	4.968E 00	6.666E-01	6.666E-01	1.052E 00	6.337E-01
2.368E 06	2.698E 06	1.548E 06	-8.081E-10	1.630E-05	4.968E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
2.485E 06	2.834E 06	1.626E 06	-5.428E-10	1.324E-05	4.968E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
2.607E 06	2.982E 06	1.708E 06	-3.563E-10	1.118E-05	4.968E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
2.730E 06	3.136E 06	1.792E 06	-2.054E-10	9.210E-06	4.968E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
2.857E 06	3.295E 06	1.875E 06	-9.531E-11	7.744E-06	4.968E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
2.987E 06	3.461E 06	1.960E 06	-4.561E-11	6.364E-06	4.968E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
3.121E 06	3.632E 06	2.052E 06	-9.958E-12	5.448E-06	4.968E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
3.255E 06	3.799E 06	2.139E 06	4.592E-11	4.948E-06	4.968E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
3.395E 06	3.984E 06	2.232E 06	8.522E-11	4.094E-06	4.968E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
3.536E 06	4.162E 06	2.328E 06	1.192E-10	4.378E-06	4.968E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
3.681E 06	4.360E 06	2.427E 06	1.446E-10	3.209E-06	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
3.828E 06	4.551E 06	2.528E 06	1.447E-10	2.803E-06	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.052E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(c) Pressure,

Temperature, T, °K	Degree of dissociation, p	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	3.595E-08	7.190E-08	7.390E-04	3.083E-04	1.047E-03	2.128E-08	1.047E-03	1.999E-04
1200	3.122E-06	6.245E-06	8.353E-04	3.803E-04	1.216E-03	1.514E-06	1.217E-03	2.260E-04
1400	7.681E-05	1.536E-04	9.287E-04	4.625E-04	1.391E-03	3.154E-05	1.423E-03	2.512E-04
1600	8.591E-04	1.717E-03	1.019E-03	5.512E-04	1.571E-03	3.053E-04	1.876E-03	2.754E-04
1800	5.657E-03	1.125E-02	1.118E-03	6.405E-04	1.758E-03	1.759E-03	3.517E-03	2.998E-04
2000	2.568E-02	5.007E-02	1.246E-03	7.190E-04	1.965E-03	7.001E-03	8.967E-03	3.249E-04
2200	8.855E-02	1.627E-01	1.465E-03	7.533E-04	2.218E-03	2.042E-02	2.263E-02	3.517E-04
2400	2.434E-01	3.916E-01	1.819E-03	6.783E-04	2.497E-03	4.254E-02	4.503E-02	3.721E-04
2600	5.180E-01	6.825E-01	2.205E-03	4.534E-04	2.658E-03	5.296E-02	5.562E-02	3.683E-04
2800	7.904E-01	8.829E-01	2.479E-03	2.062E-04	2.685E-03	3.253E-02	3.521E-02	3.614E-04
3000	9.280E-01	9.627E-01	2.668E-03	7.533E-05	2.743E-03	1.219E-02	1.494E-02	3.694E-04
3200	9.755E-01	9.876E-01	2.829E-03	2.758E-05	2.856E-03	4.081E-03	6.937E-03	3.856E-04
3400	9.909E-01	9.954E-01	2.983E-03	1.097E-05	2.994E-03	1.440E-03	4.434E-03	4.047E-04
3600	9.963E-01	9.982E-01	3.136E-03	4.731E-06	3.140E-03	5.490E-04	3.689E-03	4.246E-04
3800	9.984E-01	9.992E-01	3.286E-03	2.269E-06	3.288E-03	2.337E-04	3.522E-03	4.447E-04
4000	9.992E-01	9.996E-01	3.437E-03	1.166E-06	3.438E-03	1.070E-04	3.545E-03	4.650E-04
4200	9.996E-01	9.998E-01	3.586E-03	6.358E-07	3.587E-03	5.235E-05	3.639E-03	4.852E-04
4400	9.998E-01	9.999E-01	3.737E-03	3.689E-07	3.737E-03	2.737E-05	3.764E-03	5.055E-04
4600	9.999E-01	9.999E-01	3.885E-03	2.245E-07	3.886E-03	1.508E-05	3.901E-03	5.256E-04
4800	9.999E-01	1.000E-00	4.034E-03	1.421E-07	4.034E-03	8.677E-06	4.043E-03	5.457E-04
5000	1.000E-00	1.000E-00	4.182E-03	9.365E-08	4.182E-03	5.218E-06	4.188E-03	5.657E-04
5200	1.000E-00	1.000E-00	4.331E-03	6.394E-08	4.332E-03	3.262E-06	4.335E-03	5.859E-04
5400	1.000E-00	1.000E-00	4.481E-03	4.500E-08	4.481E-03	2.109E-06	4.483E-03	6.061E-04
5600	1.000E-00	1.000E-00	4.629E-03	3.251E-08	4.629E-03	1.403E-06	4.630E-03	6.262E-04
5800	1.000E-00	1.000E-00	4.777E-03	2.406E-08	4.777E-03	9.594E-07	4.778E-03	6.462E-04
6000	1.000E-00	1.000E-00	4.926E-03	1.815E-08	4.926E-03	6.702E-07	4.926E-03	6.663E-04
6200	1.000E-00	1.000E-00	5.074E-03	1.366E-08	5.074E-03	4.786E-07	5.074E-03	6.864E-04
6400	1.000E-00	1.000E-00	5.223E-03	1.059E-08	5.223E-03	3.498E-07	5.223E-03	7.065E-04
6600	1.000E-00	1.000E-00	5.372E-03	8.357E-09	5.372E-03	2.616E-07	5.372E-03	7.266E-04
6800	1.000E-00	1.000E-00	5.519E-03	6.685E-09	5.519E-03	1.992E-07	5.519E-03	7.466E-04
7000	1.000E-00	1.000E-00	5.669E-03	5.473E-09	5.669E-03	1.562E-07	5.669E-03	7.668E-04
7200	1.000E-00	1.000E-00	5.816E-03	4.527E-09	5.816E-03	1.240E-07	5.816E-03	7.867E-04
7400	1.000E-00	1.000E-00	5.965E-03	3.817E-09	5.965E-03	1.000E-07	5.965E-03	8.069E-04
7600	1.000E-00	1.000E-00	6.114E-03	3.230E-09	6.114E-03	8.138E-08	6.114E-03	8.270E-04
7800	1.000E-00	1.000E-00	6.263E-03	2.779E-09	6.263E-03	6.760E-08	6.263E-03	8.472E-04
8000	1.000E-00	1.000E-00	6.412E-03	2.404E-09	6.412E-03	5.662E-08	6.412E-03	8.673E-04
8200	1.000E-00	1.000E-00	6.560E-03	2.115E-09	6.560E-03	4.819E-08	6.560E-03	8.874E-04
8400	1.000E-00	1.000E-00	6.709E-03	1.857E-09	6.709E-03	4.095E-08	6.709E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	1.665E-09	6.859E-03	3.551E-08	6.859E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	1.487E-09	7.009E-03	3.074E-08	7.009E-03	9.480E-04
9000	1.000E-00	1.000E-00	7.159E-03	1.325E-09	7.159E-03	2.663E-08	7.159E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	1.209E-09	7.307E-03	2.362E-08	7.307E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	1.089E-09	7.458E-03	2.066E-08	7.458E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	9.566E-10	7.609E-03	2.121E-08	7.609E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	8.859E-10	7.759E-03	1.590E-08	7.759E-03	1.049E-03
10000	1.000E-00	1.000E-00	7.909E-03	8.070E-10	7.909E-03	1.414E-08	7.909E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^{-3} atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E 03	2.090E 03	1.480E 03	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E 03	4.945E 03	3.490E 03	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E 03	8.933E 03	6.165E 03	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E 04	1.711E 04	1.124E 04	-5.920E-09	1.020E-04	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E 04	2.398E 04	1.537E 04	-4.934E-07	6.216E-03	7.411E 00	6.825E-01	6.828E-01	1.483E 00	4.603E-01
3.027E 04	3.196E 04	2.012E 04	-1.128E-05	1.134E-01	7.723E 00	6.765E-01	6.817E-01	1.522E 00	4.479E-01
3.860E 04	4.098E 04	2.547E 04	-1.212E-04	9.779E-01	8.785E 00	6.404E-01	6.797E-01	1.552E 00	4.381E-01
4.789E 04	5.092E 04	3.141E 04	-7.393E-04	5.102E 00	1.307E 01	5.558E-01	6.778E-01	1.562E 00	4.339E-01
5.810E 04	6.210E 04	3.801E 04	-3.056E-03	1.850E 01	2.652E 01	4.888E-01	6.738E-01	1.542E 00	4.368E-01
6.924E 04	7.426E 04	4.531E 04	-8.101E-03	4.964E 01	5.741E 01	4.817E-01	6.661E-01	1.443E 00	4.617E-01
8.128E 04	8.753E 04	5.321E 04	-1.349E-02	9.571E 01	1.028E 02	5.239E-01	6.520E-01	1.263E 00	5.164E-01
9.426E 04	1.017E 05	6.165E 04	-1.101E-02	1.111E 02	1.172E 02	5.845E-01	6.380E-01	1.097E 00	5.818E-01
1.081E 05	1.170E 05	7.077E 04	-4.832E-03	6.387E 01	6.927E 01	6.313E-01	6.459E-01	1.025E 00	6.301E-01
1.230E 05	1.333E 05	8.035E 04	-1.554E-03	2.252E 01	2.763E 01	6.536E-01	6.581E-01	1.009E 00	6.526E-01
1.387E 05	1.506E 05	9.055E 04	-5.022E-04	7.116E 00	1.213E 01	6.608E-01	6.635E-01	1.007E 00	6.589E-01
1.552E 05	1.690E 05	1.014E 05	-1.740E-04	2.377E 00	7.363E 00	6.637E-01	6.655E-01	1.008E 00	6.600E-01
1.728E 05	1.883E 05	1.128E 05	-6.877E-05	8.611E-01	5.836E 00	6.652E-01	6.661E-01	1.010E 00	6.596E-01
1.912E 05	2.086E 05	1.246E 05	-2.879E-05	3.492E-01	5.320E 00	6.659E-01	6.664E-01	1.012E 00	6.588E-01
2.105E 05	2.308E 05	1.369E 05	-1.307E-05	1.523E-01	5.121E 00	6.662E-01	6.665E-01	1.016E 00	6.558E-01
2.307E 05	2.529E 05	1.502E 05	-6.225E-06	7.135E-02	5.040E 00	6.664E-01	6.666E-01	1.016E 00	6.559E-01
2.518E 05	2.774E 05	1.639E 05	-3.267E-06	3.563E-02	5.004E 00	6.665E-01	6.666E-01	1.021E 00	6.526E-01
2.738E 05	3.016E 05	1.782E 05	-1.766E-06	1.887E-02	4.987E 00	6.665E-01	6.666E-01	1.022E 00	6.526E-01
2.968E 05	3.278E 05	1.930E 05	-1.035E-06	1.043E-02	4.978E 00	6.666E-01	6.666E-01	1.025E 00	6.505E-01
3.206E 05	3.546E 05	2.084E 05	-5.895E-07	6.037E-03	4.974E 00	6.666E-01	6.666E-01	1.027E 00	6.493E-01
3.454E 05	3.820E 05	2.246E 05	-3.555E-07	3.644E-03	4.971E 00	6.666E-01	6.666E-01	1.027E 00	6.492E-01
3.709E 05	4.117E 05	2.412E 05	-2.254E-07	2.270E-03	4.970E 00	6.666E-01	6.666E-01	1.030E 00	6.472E-01
3.974E 05	4.418E 05	2.581E 05	-1.466E-07	1.460E-03	4.969E 00	6.666E-01	6.666E-01	1.032E 00	6.461E-01
4.249E 05	4.734E 05	2.762E 05	-9.750E-08	9.645E-04	4.968E 00	6.666E-01	6.666E-01	1.034E 00	6.444E-01
4.535E 05	5.053E 05	2.941E 05	-6.599E-08	6.530E-04	4.968E 00	6.666E-01	6.666E-01	1.035E 00	6.441E-01
4.824E 05	5.385E 05	3.132E 05	-4.283E-08	4.522E-04	4.968E 00	6.666E-01	6.666E-01	1.036E 00	6.433E-01
5.125E 05	5.732E 05	3.331E 05	-2.949E-08	3.205E-04	4.968E 00	6.666E-01	6.666E-01	1.038E 00	6.422E-01
5.435E 05	6.093E 05	3.538E 05	-2.052E-08	2.326E-04	4.968E 00	6.666E-01	6.666E-01	1.040E 00	6.408E-01
5.755E 05	6.452E 05	3.747E 05	-1.438E-08	1.722E-04	4.968E 00	6.666E-01	6.666E-01	1.041E 00	6.405E-01
6.084E 05	6.843E 05	3.963E 05	-9.663E-09	1.311E-04	4.968E 00	6.666E-01	6.666E-01	1.044E 00	6.385E-01
6.418E 05	7.232E 05	4.196E 05	-7.270E-09	1.013E-04	4.968E 00	6.666E-01	6.666E-01	1.045E 00	6.376E-01
6.766E 05	7.655E 05	4.421E 05	-5.539E-09	7.936E-05	4.968E 00	6.666E-01	6.666E-01	1.050E 00	6.350E-01
7.124E 05	8.075E 05	4.663E 05	-3.628E-09	6.285E-05	4.968E 00	6.666E-01	6.666E-01	1.052E 00	6.337E-01
7.488E 05	8.533E 05	4.895E 05	-2.514E-09	5.071E-05	4.968E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
7.860E 05	8.962E 05	5.143E 05	-1.701E-09	4.147E-05	4.968E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
8.243E 05	9.430E 05	5.400E 05	-1.096E-09	3.439E-05	4.968E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
8.634E 05	9.916E 05	5.666E 05	-6.348E-10	2.847E-05	4.968E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
9.034E 05	1.042E 06	5.928E 05	-2.960E-10	2.405E-05	4.968E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
9.445E 05	1.094E 06	6.199E 05	-1.454E-10	2.029E-05	4.968E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
9.870E 05	1.149E 06	6.490E 05	-3.130E-11	1.712E-05	4.968E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
1.029E 06	1.201E 06	6.763E 05	1.378E-10	1.484E-05	4.968E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
1.073E 06	1.260E 06	7.058E 05	2.634E-10	1.265E-05	4.968E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
1.118E 06	1.316E 06	7.361E 05	3.458E-10	1.270E-05	4.968E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
1.164E 06	1.379E 06	7.674E 05	4.178E-10	9.271E-06	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
1.210E 06	1.439E 06	7.995E 05	4.159E-10	8.060E-06	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.052E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively; [d] Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, μ, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	2.022E-09	4.043E-09	7.390E-04	3.083E-04	1.047E-03	1.196E-09	1.047E-03	1.999E-04
1200	1.756E-07	3.512E-07	8.353E-04	3.803E-04	1.216E-03	8.511E-08	1.216E-03	2.260E-04
1400	4.319E-06	8.639E-06	9.286E-04	4.625E-04	1.391E-03	1.774E-06	1.393E-03	2.512E-04
1600	4.831E-05	9.661E-05	1.018E-03	5.518E-04	1.570E-03	1.718E-05	1.587E-03	2.754E-04
1800	3.181E-04	6.360E-04	1.107E-03	6.448E-04	1.752E-03	9.942E-05	1.852E-03	2.995E-04
2000	1.444E-03	2.885E-03	1.196E-03	7.409E-04	1.937E-03	4.036E-04	2.341E-03	3.230E-04
2200	4.999E-03	9.948E-03	1.291E-03	8.375E-04	2.129E-03	1.258E-03	3.387E-03	3.467E-04
2400	1.411E-02	2.783E-02	1.403E-03	9.275E-04	2.331E-03	3.214E-03	5.544E-03	3.715E-04
2600	3.404E-02	6.583E-02	1.543E-03	1.001E-03	2.545E-03	6.974E-03	9.519E-03	3.970E-04
2800	7.235E-02	1.349E-01	1.738E-03	1.047E-03	2.785E-03	1.318E-02	1.596E-02	4.245E-04
3000	1.387E-01	2.436E-01	1.995E-03	1.044E-03	3.038E-03	2.181E-02	2.485E-02	4.508E-04
3200	2.418E-01	3.895E-01	2.311E-03	9.736E-04	3.284E-03	3.127E-02	3.456E-02	4.718E-04
3400	3.830E-01	5.538E-01	2.641E-03	8.300E-04	3.471E-03	3.783E-02	4.130E-02	4.813E-04
3600	5.485E-01	7.084E-01	2.940E-03	6.312E-04	3.571E-03	3.734E-02	4.091E-02	4.816E-04
3800	6.998E-01	8.234E-01	3.183E-03	4.357E-04	3.619E-03	2.992E-02	3.354E-02	4.823E-04
4000	8.162E-01	8.988E-01	3.384E-03	2.788E-04	3.663E-03	2.031E-02	2.397E-02	4.880E-04
4200	8.915E-01	9.427E-01	3.558E-03	1.720E-04	3.731E-03	1.242E-02	1.615E-02	4.989E-04
4400	9.361E-01	9.670E-01	3.721E-03	1.067E-04	3.828E-03	7.339E-03	1.117E-02	5.137E-04
4600	9.615E-01	9.804E-01	3.876E-03	6.733E-05	3.944E-03	4.324E-03	8.267E-03	5.307E-04
4800	9.764E-01	9.880E-01	4.028E-03	4.350E-05	4.072E-03	2.585E-03	6.656E-03	5.489E-04
5000	9.850E-01	9.924E-01	4.179E-03	2.902E-05	4.208E-03	1.589E-03	5.797E-03	5.679E-04
5200	9.901E-01	9.950E-01	4.329E-03	1.995E-05	4.349E-03	1.006E-03	5.355E-03	5.874E-04
5400	9.933E-01	9.967E-01	4.479E-03	1.410E-05	4.493E-03	6.558E-04	5.149E-03	6.071E-04
5600	9.954E-01	9.977E-01	4.628E-03	1.021E-05	4.638E-03	4.385E-04	5.077E-03	6.269E-04
5800	9.967E-01	9.984E-01	4.776E-03	7.567E-06	4.784E-03	3.006E-04	5.084E-03	6.467E-04
6000	9.976E-01	9.988E-01	4.925E-03	5.719E-06	4.931E-03	2.106E-04	5.142E-03	6.667E-04
6200	9.983E-01	9.991E-01	5.074E-03	4.306E-06	5.078E-03	1.506E-04	5.228E-03	6.867E-04
6400	9.987E-01	9.994E-01	5.222E-03	3.336E-06	5.226E-03	1.100E-04	5.336E-03	7.067E-04
6600	9.990E-01	9.995E-01	5.371E-03	2.634E-06	5.374E-03	8.238E-05	5.456E-03	7.268E-04
6800	9.992E-01	9.996E-01	5.519E-03	2.108E-06	5.521E-03	6.276E-05	5.584E-03	7.467E-04
7000	9.994E-01	9.997E-01	5.669E-03	1.724E-06	5.670E-03	4.917E-05	5.719E-03	7.669E-04
7200	9.995E-01	9.998E-01	5.816E-03	1.423E-06	5.817E-03	3.894E-05	5.856E-03	7.868E-04
7400	9.996E-01	9.998E-01	5.965E-03	1.197E-06	5.966E-03	3.135E-05	5.998E-03	8.070E-04
7600	9.997E-01	9.998E-01	6.114E-03	1.013E-06	6.115E-03	2.550E-05	6.140E-03	8.271E-04
7800	9.997E-01	9.999E-01	6.263E-03	8.699E-07	6.264E-03	2.116E-05	6.285E-03	8.473E-04
8000	9.998E-01	9.999E-01	6.412E-03	7.536E-07	6.413E-03	1.774E-05	6.430E-03	8.674E-04
8200	9.998E-01	9.999E-01	6.560E-03	6.637E-07	6.561E-03	1.512E-05	6.576E-03	8.874E-04
8400	9.998E-01	9.999E-01	6.709E-03	5.832E-07	6.710E-03	1.286E-05	6.723E-03	9.076E-04
8600	9.999E-01	9.999E-01	6.859E-03	5.207E-07	6.860E-03	1.110E-05	6.871E-03	9.279E-04
8800	9.999E-01	9.999E-01	7.009E-03	4.642E-07	7.009E-03	9.598E-06	7.019E-03	9.481E-04
9000	9.999E-01	9.999E-01	7.159E-03	4.170E-07	7.160E-03	8.379E-06	7.168E-03	9.685E-04
9200	9.999E-01	1.000E-00	7.307E-03	3.734E-07	7.307E-03	7.292E-06	7.315E-03	9.885E-04
9400	9.999E-01	1.000E-00	7.458E-03	3.378E-07	7.459E-03	6.408E-06	7.465E-03	1.009E-03
9600	9.999E-01	1.000E-00	7.609E-03	3.043E-07	7.609E-03	6.748E-06	7.616E-03	1.029E-03
9800	9.999E-01	1.000E-00	7.759E-03	2.781E-07	7.759E-03	4.990E-06	7.764E-03	1.050E-03
10000	9.999E-01	1.000E-00	7.909E-03	2.482E-07	7.910E-03	4.348E-06	7.914E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

$10^{-2.5}$ atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
6.105E 00	6.610E 00	4.679E 00	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
1.505E 01	1.564E 01	1.104E 01	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
2.742E 01	2.825E 01	1.950E 01	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
5.205E 01	5.410E 01	3.556E 01	-3.329E-10	5.739E-06	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
7.238E 01	7.582E 01	4.861E 01	-2.775E-08	3.496E-04	7.405E 00	6.828E-01	6.828E-01	1.483E 00	4.603E-01
9.572E 01	1.011E 02	6.361E 01	-6.347E-07	6.375E-03	7.616E 00	6.814E-01	6.817E-01	1.522E 00	4.479E-01
1.221E 02	1.296E 02	8.056E 01	-6.832E-06	5.504E-02	7.867E 00	6.772E-01	6.798E-01	1.553E 00	4.377E-01
1.514E 02	1.610E 02	9.933E 01	-4.227E-05	2.884E-01	8.288E 00	6.651E-01	6.784E-01	1.574E 00	4.311E-01
1.837E 02	1.964E 02	1.202E 02	-1.854E-04	1.067E 00	9.230E 00	6.326E-01	6.760E-01	1.594E 00	4.240E-01
2.190E 02	2.348E 02	1.433E 02	-5.923E-04	3.059E 00	1.135E 01	5.792E-01	6.732E-01	1.602E 00	4.202E-01
2.570E 02	2.768E 02	1.683E 02	-1.588E-03	7.231E 00	1.559E 01	5.257E-01	6.707E-01	1.595E 00	4.205E-01
2.981E 02	3.216E 02	1.950E 02	-3.381E-03	1.463E 01	2.297E 01	4.914E-01	6.676E-01	1.563E 00	4.271E-01
3.420E 02	3.701E 02	2.238E 02	-6.133E-03	2.587E 01	3.406E 01	4.818E-01	6.639E-01	1.497E 00	4.434E-01
3.890E 02	4.214E 02	2.541E 02	-9.057E-03	4.028E 01	4.814E 01	4.934E-01	6.584E-01	1.400E 00	4.704E-01
4.385E 02	4.762E 02	2.864E 02	-1.098E-02	5.453E 01	6.189E 01	5.205E-01	6.507E-01	1.284E 00	5.068E-01
4.908E 02	5.343E 02	3.205E 02	-1.044E-02	6.247E 01	6.922E 01	5.534E-01	6.418E-01	1.177E 00	5.452E-01
5.464E 02	5.955E 02	3.566E 02	-8.332E-03	5.857E 01	6.472E 01	5.852E-01	6.372E-01	1.098E 00	5.803E-01
6.046E 02	6.598E 02	3.940E 02	-5.330E-03	4.471E 01	5.041E 01	6.113E-01	6.402E-01	1.053E 00	6.078E-01
6.656E 02	7.298E 02	4.330E 02	-3.089E-03	2.888E 01	3.428E 01	6.286E-01	6.471E-01	1.035E 00	6.253E-01
7.296E 02	7.997E 02	4.749E 02	-1.677E-03	1.692E 01	2.213E 01	6.416E-01	6.538E-01	1.025E 00	6.379E-01
7.962E 02	8.772E 02	5.184E 02	-9.435E-04	9.552E 00	1.466E 01	6.478E-01	6.586E-01	1.026E 00	6.421E-01
8.659E 02	9.537E 02	5.636E 02	-5.295E-04	5.412E 00	1.046E 01	6.536E-01	6.616E-01	1.024E 00	6.463E-01
9.386E 02	1.036E 03	6.102E 02	-3.169E-04	3.106E 00	8.126E 00	6.569E-01	6.635E-01	1.026E 00	6.467E-01
1.014E 03	1.121E 03	6.590E 02	-1.826E-04	1.838E 00	6.840E 00	6.597E-01	6.646E-01	1.027E 00	6.469E-01
1.092E 03	1.208E 03	7.103E 02	-1.109E-04	1.124E 00	6.114E 00	6.620E-01	6.653E-01	1.027E 00	6.476E-01
1.173E 03	1.302E 03	7.627E 02	-7.064E-05	7.059E-01	5.689E 00	6.632E-01	6.657E-01	1.030E 00	6.461E-01
1.257E 03	1.397E 03	8.162E 02	-4.604E-05	4.561E-01	5.434E 00	6.642E-01	6.660E-01	1.032E 00	6.453E-01
1.344E 03	1.497E 03	8.734E 02	-3.067E-05	3.022E-01	5.277E 00	6.648E-01	6.662E-01	1.035E 00	6.439E-01
1.434E 03	1.598E 03	9.300E 02	-2.080E-05	2.052E-01	5.178E 00	6.654E-01	6.663E-01	1.035E 00	6.437E-01
1.526E 03	1.703E 03	9.904E 02	-1.350E-05	1.423E-01	5.114E 00	6.657E-01	6.664E-01	1.036E 00	6.430E-01
1.621E 03	1.812E 03	1.053E 03	-9.289E-06	1.008E-01	5.071E 00	6.659E-01	6.664E-01	1.038E 00	6.420E-01
1.719E 03	1.927E 03	1.119E 03	-6.468E-06	7.323E-02	5.043E 00	6.661E-01	6.665E-01	1.040E 00	6.407E-01
1.820E 03	2.040E 03	1.185E 03	-4.535E-06	5.427E-02	5.024E 00	6.662E-01	6.665E-01	1.041E 00	6.404E-01
1.924E 03	2.164E 03	1.253E 03	-3.044E-06	4.128E-02	5.010E 00	6.663E-01	6.665E-01	1.044E 00	6.384E-01
2.030E 03	2.287E 03	1.327E 03	-2.284E-06	3.181E-02	5.000E 00	6.664E-01	6.666E-01	1.045E 00	6.376E-01
2.139E 03	2.421E 03	1.398E 03	-1.737E-06	2.487E-02	4.993E 00	6.664E-01	6.666E-01	1.050E 00	6.349E-01
2.253E 03	2.553E 03	1.474E 03	-1.137E-06	1.970E-02	4.988E 00	6.664E-01	6.666E-01	1.052E 00	6.336E-01
2.368E 03	2.698E 03	1.548E 03	-7.871E-07	1.587E-02	4.984E 00	6.665E-01	6.666E-01	1.057E 00	6.304E-01
2.485E 03	2.834E 03	1.626E 03	-5.332E-07	1.300E-02	4.981E 00	6.665E-01	6.666E-01	1.058E 00	6.303E-01
2.607E 03	2.982E 03	1.708E 03	-3.440E-07	1.079E-02	4.979E 00	6.665E-01	6.666E-01	1.061E 00	6.282E-01
2.730E 03	3.136E 03	1.792E 03	-1.993E-07	8.937E-03	4.977E 00	6.665E-01	6.666E-01	1.065E 00	6.259E-01
2.857E 03	3.295E 03	1.875E 03	-9.255E-08	7.519E-03	4.975E 00	6.665E-01	6.666E-01	1.069E 00	6.234E-01
2.987E 03	3.461E 03	1.960E 03	-4.540E-08	6.333E-03	4.974E 00	6.665E-01	6.666E-01	1.074E 00	6.206E-01
3.121E 03	3.632E 03	2.052E 03	-9.849E-09	5.387E-03	4.973E 00	6.665E-01	6.666E-01	1.079E 00	6.177E-01
3.255E 03	3.799E 03	2.139E 03	4.253E-08	4.582E-03	4.972E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
3.395E 03	3.984E 03	2.232E 03	8.168E-08	3.924E-03	4.972E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
3.536E 03	4.162E 03	2.328E 03	1.100E-07	4.039E-03	4.972E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
3.681E 03	4.360E 03	2.427E 03	1.311E-07	2.910E-03	4.971E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
3.828E 03	4.551E 03	2.528E 03	1.279E-07	2.479E-03	4.970E 00	6.666E-01	6.666E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(e) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	1.137E-08	2.274E-08	7.390E-04	3.083E-04	1.047E-03	6.728E-09	1.047E-03	1.999E-04
1200	9.874E-07	1.975E-06	8.353E-04	3.803E-04	1.216E-03	4.786E-07	1.216E-03	2.260E-04
1400	2.429E-05	4.858E-05	9.286E-04	4.625E-04	1.391E-03	9.974E-06	1.401E-03	2.512E-04
1600	2.717E-04	5.432E-04	1.018E-03	5.516E-04	1.570E-03	9.659E-05	1.667E-03	2.754E-04
1800	1.789E-03	3.571E-03	1.110E-03	6.436E-04	1.754E-03	5.583E-04	2.312E-03	2.996E-04
2000	8.122E-03	1.611E-02	1.211E-03	7.348E-04	1.945E-03	2.255E-03	4.200E-03	3.236E-04
2200	2.810E-02	5.466E-02	1.344E-03	8.139E-04	2.158E-03	6.909E-03	9.067E-03	3.488E-04
2400	7.912E-02	1.466E-01	1.551E-03	8.544E-04	2.405E-03	1.683E-02	1.923E-02	3.763E-04
2600	1.881E-01	3.166E-01	1.859E-03	8.153E-04	2.674E-03	3.239E-02	3.507E-02	4.001E-04
2800	3.777E-01	5.483E-01	2.232E-03	6.610E-04	2.893E-03	4.615E-02	4.904E-02	4.089E-04
3000	6.188E-01	7.645E-01	2.555E-03	4.214E-04	2.976E-03	4.306E-02	4.603E-02	4.031E-04
3200	8.140E-01	8.975E-01	2.787E-03	2.150E-04	3.002E-03	2.582E-02	2.883E-02	4.024E-04
3400	9.190E-01	9.578E-01	2.967E-03	9.907E-05	3.066E-03	1.191E-02	1.498E-02	4.121E-04
3600	9.652E-01	9.823E-01	3.129E-03	4.533E-05	3.174E-03	5.069E-03	8.244E-03	4.279E-04
3800	9.839E-01	9.919E-01	3.283E-03	2.226E-05	3.305E-03	2.253E-03	5.558E-03	4.463E-04
4000	9.922E-01	9.961E-01	3.435E-03	1.155E-05	3.447E-03	1.052E-03	4.498E-03	4.658E-04
4200	9.959E-01	9.980E-01	3.585E-03	6.327E-06	3.592E-03	5.187E-04	4.110E-03	4.856E-04
4400	9.978E-01	9.989E-01	3.736E-03	3.679E-06	3.740E-03	2.724E-04	4.012E-03	5.057E-04
4600	9.987E-01	9.994E-01	3.885E-03	2.241E-06	3.887E-03	1.504E-04	4.038E-03	5.257E-04
4800	9.992E-01	9.996E-01	4.034E-03	1.420E-06	4.035E-03	8.661E-05	4.122E-03	5.458E-04
5000	9.995E-01	9.998E-01	4.182E-03	9.360E-07	4.183E-03	5.212E-05	4.235E-03	5.658E-04
5200	9.997E-01	9.998E-01	4.331E-03	6.391E-07	4.332E-03	3.260E-05	4.365E-03	5.860E-04
5400	9.998E-01	9.999E-01	4.481E-03	4.499E-07	4.481E-03	2.108E-05	4.502E-03	6.061E-04
5600	9.999E-01	9.999E-01	4.629E-03	3.249E-07	4.629E-03	1.402E-05	4.643E-03	6.262E-04
5800	9.999E-01	9.999E-01	4.777E-03	2.403E-07	4.777E-03	9.583E-06	4.787E-03	6.462E-04
6000	9.999E-01	1.000E-00	4.926E-03	1.814E-07	4.926E-03	6.699E-06	4.933E-03	6.663E-04
6200	9.999E-01	1.000E-00	5.074E-03	1.365E-07	5.074E-03	4.782E-06	5.079E-03	6.864E-04
6400	1.000E-00	1.000E-00	5.223E-03	1.057E-07	5.223E-03	3.490E-06	5.226E-03	7.065E-04
6600	1.000E-00	1.000E-00	5.372E-03	8.341E-08	5.372E-03	2.611E-06	5.374E-03	7.266E-04
6800	1.000E-00	1.000E-00	5.519E-03	6.674E-08	5.519E-03	1.988E-06	5.521E-03	7.466E-04
7000	1.000E-00	1.000E-00	5.669E-03	5.458E-08	5.669E-03	1.558E-06	5.670E-03	7.668E-04
7200	1.000E-00	1.000E-00	5.816E-03	4.503E-08	5.816E-03	1.233E-06	5.817E-03	7.867E-04
7400	1.000E-00	1.000E-00	5.965E-03	3.787E-08	5.965E-03	9.925E-07	5.966E-03	8.069E-04
7600	1.000E-00	1.000E-00	6.114E-03	3.206E-08	6.114E-03	8.077E-07	6.114E-03	8.270E-04
7800	1.000E-00	1.000E-00	6.263E-03	2.754E-08	6.263E-03	6.700E-07	6.264E-03	8.473E-04
8000	1.000E-00	1.000E-00	6.412E-03	2.386E-08	6.412E-03	5.619E-07	6.412E-03	8.673E-04
8200	1.000E-00	1.000E-00	6.560E-03	2.101E-08	6.560E-03	4.789E-07	6.561E-03	8.874E-04
8400	1.000E-00	1.000E-00	6.709E-03	1.846E-08	6.709E-03	4.071E-07	6.710E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	1.648E-08	6.859E-03	3.515E-07	6.859E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	1.469E-08	7.009E-03	3.038E-07	7.009E-03	9.480E-04
9000	1.000E-00	1.000E-00	7.159E-03	1.322E-08	7.159E-03	2.657E-07	7.160E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	1.185E-08	7.307E-03	2.314E-07	7.307E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	1.070E-08	7.458E-03	2.030E-07	7.459E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	9.632E-09	7.609E-03	2.136E-07	7.609E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	8.825E-09	7.759E-03	1.583E-07	7.759E-03	1.049E-03
10000	1.000E-00	1.000E-00	7.909E-03	7.859E-09	7.909E-03	1.377E-07	7.909E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^{-2} atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E 02	2.090E 02	1.480E 02	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E 02	4.945E 02	3.490E 02	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E 02	8.933E 02	6.165E 02	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E 03	1.711E 03	1.124E 03	-1.872E-09	3.227E-05	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E 03	2.398E 03	1.537E 03	-1.560E-07	1.966E-03	7.406E 00	6.827E-01	6.828E-01	1.483E 00	4.603E-01
3.027E 03	3.196E 03	2.012E 03	-3.569E-06	3.585E-02	7.645E 00	6.800E-01	6.817E-01	1.522E 00	4.479E-01
3.860E 03	4.098E 03	2.547E 03	-3.839E-05	3.094E-01	8.120E 00	6.658E-01	6.798E-01	1.553E 00	4.378E-01
4.789E 03	5.092E 03	3.141E 03	-2.366E-04	1.620E 00	9.610E 00	6.187E-01	6.782E-01	1.571E 00	4.318E-01
5.810E 03	6.210E 03	3.801E 03	-1.021E-03	5.959E 00	1.408E 01	5.424E-01	6.754E-01	1.580E 00	4.276E-01
6.924E 03	7.426E 03	4.531E 03	-3.099E-03	1.680E 01	2.494E 01	4.893E-01	6.713E-01	1.552E 00	4.325E-01
8.128E 03	8.753E 03	5.321E 03	-7.276E-03	3.786E 01	4.581E 01	4.798E-01	6.657E-01	1.469E 00	4.532E-01
9.426E 03	1.017E 04	6.165E 03	-1.161E-02	6.796E 01	7.540E 01	5.070E-01	6.558E-01	1.326E 00	4.947E-01
1.081E 04	1.170E 04	7.077E 03	-1.236E-02	9.060E 01	9.725E 01	5.542E-01	6.423E-01	1.171E 00	5.487E-01
1.230E 04	1.333E 04	8.035E 03	-8.149E-03	7.953E 01	8.540E 01	6.006E-01	6.381E-01	1.067E 00	5.980E-01
1.387E 04	1.506E 04	9.055E 03	-3.856E-03	4.503E 01	5.040E 01	6.330E-01	6.474E-01	1.025E 00	6.313E-01
1.552E 04	1.690E 04	1.014E 04	-1.566E-03	1.967E 01	2.481E 01	6.497E-01	6.570E-01	1.014E 00	6.478E-01
1.728E 04	1.883E 04	1.128E 04	-6.582E-04	7.952E 00	1.299E 01	6.574E-01	6.622E-01	1.012E 00	6.544E-01
1.912E 04	2.086E 04	1.246E 04	-2.822E-04	3.367E 00	8.368E 00	6.612E-01	6.645E-01	1.012E 00	6.564E-01
2.105E 04	2.308E 04	1.369E 04	-1.295E-04	1.496E 00	6.480E 00	6.630E-01	6.656E-01	1.017E 00	6.547E-01
2.307E 04	2.529E 04	1.502E 04	-6.194E-05	7.070E-01	5.683E 00	6.647E-01	6.661E-01	1.017E 00	6.553E-01
2.518E 04	2.774E 04	1.639E 04	-3.259E-05	3.545E-01	5.327E 00	6.654E-01	6.663E-01	1.021E 00	6.523E-01
2.738E 04	3.016E 04	1.782E 04	-1.764E-05	1.882E-01	5.158E 00	6.659E-01	6.664E-01	1.022E 00	6.524E-01
2.968E 04	3.278E 04	1.930E 04	-1.034E-05	1.041E-01	5.073E 00	6.662E-01	6.665E-01	1.025E 00	6.504E-01
3.206E 04	3.546E 04	2.084E 04	-5.891E-06	6.031E-02	5.029E 00	6.663E-01	6.666E-01	1.027E 00	6.493E-01
3.454E 04	3.820E 04	2.246E 04	-3.553E-06	3.641E-02	5.005E 00	6.664E-01	6.666E-01	1.027E 00	6.492E-01
3.709E 04	4.117E 04	2.412E 04	-2.253E-06	2.269E-02	4.991E 00	6.665E-01	6.666E-01	1.030E 00	6.472E-01
3.974E 04	4.418E 04	2.581E 04	-1.465E-06	1.459E-02	4.982E 00	6.665E-01	6.666E-01	1.032E 00	6.460E-01
4.249E 04	4.734E 04	2.762E 04	-9.740E-07	9.634E-03	4.977E 00	6.666E-01	6.666E-01	1.034E 00	6.444E-01
4.535E 04	5.053E 04	2.941E 04	-6.597E-07	6.528E-03	4.974E 00	6.666E-01	6.666E-01	1.035E 00	6.441E-01
4.824E 04	5.385E 04	3.132E 04	-4.280E-07	4.518E-03	4.972E 00	6.666E-01	6.666E-01	1.036E 00	6.433E-01
5.125E 04	5.732E 04	3.331E 04	-2.943E-07	3.198E-03	4.971E 00	6.666E-01	6.666E-01	1.038E 00	6.422E-01
5.435E 04	6.093E 04	3.538E 04	-2.048E-07	2.321E-03	4.970E 00	6.666E-01	6.666E-01	1.040E 00	6.408E-01
5.755E 04	6.452E 04	3.747E 04	-1.436E-07	1.720E-03	4.969E 00	6.666E-01	6.666E-01	1.041E 00	6.405E-01
6.084E 04	6.843E 04	3.963E 04	-9.636E-08	1.307E-03	4.969E 00	6.666E-01	6.666E-01	1.044E 00	6.385E-01
6.418E 04	7.232E 04	4.196E 04	-7.230E-08	1.007E-03	4.969E 00	6.666E-01	6.666E-01	1.045E 00	6.376E-01
6.766E 04	7.655E 04	4.421E 04	-5.495E-08	7.873E-04	4.968E 00	6.666E-01	6.666E-01	1.050E 00	6.350E-01
7.124E 04	8.075E 04	4.663E 04	-3.601E-08	6.238E-04	4.968E 00	6.666E-01	6.666E-01	1.052E 00	6.337E-01
7.488E 04	8.533E 04	4.895E 04	-2.492E-08	5.025E-04	4.968E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
7.860E 04	8.962E 04	5.143E 04	-1.688E-08	4.117E-04	4.968E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
8.243E 04	9.430E 04	5.400E 04	-1.089E-08	3.417E-04	4.968E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
8.634E 04	9.916E 04	5.666E 04	-6.310E-09	2.830E-04	4.968E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
9.034E 04	1.042E 05	5.928E 04	-2.930E-09	2.380E-04	4.968E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
9.445E 04	1.094E 05	6.199E 04	-1.437E-09	2.005E-04	4.968E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
9.870E 04	1.149E 05	6.490E 04	-3.123E-10	1.708E-04	4.968E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
1.029E 05	1.201E 05	6.763E 04	1.349E-09	1.454E-04	4.968E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
1.073E 05	1.260E 05	7.058E 04	2.587E-09	1.243E-04	4.968E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
1.118E 05	1.316E 05	7.361E 04	3.482E-09	1.278E-04	4.968E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
1.164E 05	1.379E 05	7.674E 04	4.161E-09	9.235E-05	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
1.210E 05	1.439E 05	7.995E 04	4.051E-09	7.850E-05	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(f) Pressure,

Temperature, T, °K	Degree of dissociation, p	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	6.393E-09	1.279E-08	7.390E-04	3.083E-04	1.047E-03	3.783E-09	1.047E-03	1.999E-04
1200	5.553E-07	1.111E-06	8.353E-04	3.803E-04	1.216E-03	2.692E-07	1.216E-03	2.260E-04
1400	1.366E-05	2.732E-05	9.286E-04	4.625E-04	1.391E-03	5.609E-06	1.397E-03	2.512E-04
1600	1.528E-04	3.055E-04	1.018E-03	5.517E-04	1.570E-03	5.432E-05	1.624E-03	2.754E-04
1800	1.006E-03	2.010E-03	1.109E-03	6.442E-04	1.753E-03	3.142E-04	2.067E-03	2.995E-04
2000	4.568E-03	9.094E-03	1.203E-03	7.380E-04	1.941E-03	1.272E-03	3.214E-03	3.233E-04
2200	1.581E-02	3.112E-02	1.316E-03	8.264E-04	2.143E-03	3.935E-03	6.078E-03	3.478E-04
2400	4.459E-02	8.537E-02	1.476E-03	8.930E-04	2.369E-03	9.839E-03	1.221E-02	3.744E-04
2600	1.071E-01	1.934E-01	1.711E-03	9.117E-04	2.623E-03	2.028E-02	2.290E-02	4.012E-04
2800	2.236E-01	3.655E-01	2.036E-03	8.502E-04	2.886E-03	3.408E-02	3.697E-02	4.234E-04
3000	4.050E-01	5.765E-01	2.394E-03	6.845E-04	3.079E-03	4.398E-02	4.706E-02	4.300E-04
3200	6.190E-01	7.646E-01	2.701E-03	4.560E-04	3.157E-03	4.023E-02	4.339E-02	4.260E-04
3400	7.951E-01	8.859E-01	2.929E-03	2.560E-04	3.185E-03	2.608E-02	2.927E-02	4.261E-04
3600	9.008E-01	9.478E-01	3.113E-03	1.305E-04	3.243E-03	1.347E-02	1.672E-02	4.350E-04
3800	9.516E-01	9.752E-01	3.276E-03	6.728E-05	3.343E-03	6.553E-03	9.895E-03	4.499E-04
4000	9.758E-01	9.878E-01	3.432E-03	3.571E-05	3.467E-03	3.190E-03	6.658E-03	4.677E-04
4200	9.873E-01	9.936E-01	3.584E-03	1.977E-05	3.603E-03	1.605E-03	5.208E-03	4.866E-04
4400	9.930E-01	9.965E-01	3.735E-03	1.156E-05	3.747E-03	8.510E-04	4.598E-03	5.063E-04
4600	9.959E-01	9.980E-01	3.884E-03	7.062E-06	3.892E-03	4.722E-04	4.364E-03	5.261E-04
4800	9.976E-01	9.988E-01	4.033E-03	4.479E-06	4.038E-03	2.727E-04	4.311E-03	5.460E-04
5000	9.985E-01	9.992E-01	4.182E-03	2.956E-06	4.185E-03	1.644E-04	4.349E-03	5.659E-04
5200	9.990E-01	9.995E-01	4.331E-03	2.019E-06	4.333E-03	1.029E-04	4.436E-03	5.861E-04
5400	9.993E-01	9.997E-01	4.481E-03	1.422E-06	4.482E-03	6.658E-05	4.549E-03	6.062E-04
5600	9.995E-01	9.998E-01	4.629E-03	1.027E-06	4.630E-03	4.431E-05	4.674E-03	6.262E-04
5800	9.997E-01	9.998E-01	4.777E-03	7.597E-07	4.777E-03	3.029E-05	4.808E-03	6.462E-04
6000	9.998E-01	9.999E-01	4.926E-03	5.736E-07	4.926E-03	2.118E-05	4.947E-03	6.663E-04
6200	9.998E-01	9.999E-01	5.074E-03	4.315E-07	5.074E-03	1.512E-05	5.089E-03	6.864E-04
6400	9.999E-01	9.999E-01	5.223E-03	3.341E-07	5.223E-03	1.103E-05	5.234E-03	7.065E-04
6600	9.999E-01	1.000E-00	5.372E-03	2.637E-07	5.372E-03	8.256E-06	5.380E-03	7.266E-04
6800	9.999E-01	1.000E-00	5.519E-03	2.110E-07	5.519E-03	6.287E-06	5.525E-03	7.466E-04
7000	9.999E-01	1.000E-00	5.669E-03	1.726E-07	5.669E-03	4.924E-06	5.674E-03	7.668E-04
7200	1.000E-00	1.000E-00	5.816E-03	1.423E-07	5.816E-03	3.898E-06	5.820E-03	7.867E-04
7400	1.000E-00	1.000E-00	5.965E-03	1.197E-07	5.965E-03	3.138E-06	5.968E-03	8.069E-04
7600	1.000E-00	1.000E-00	6.114E-03	1.013E-07	6.114E-03	2.552E-06	6.116E-03	8.270E-04
7800	1.000E-00	1.000E-00	6.263E-03	8.703E-08	6.263E-03	2.117E-06	6.266E-03	8.473E-04
8000	1.000E-00	1.000E-00	6.412E-03	7.540E-08	6.412E-03	1.776E-06	6.414E-03	8.673E-04
8200	1.000E-00	1.000E-00	6.560E-03	6.640E-08	6.560E-03	1.513E-06	6.562E-03	8.874E-04
8400	1.000E-00	1.000E-00	6.709E-03	5.834E-08	6.709E-03	1.286E-06	6.711E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	5.209E-08	6.859E-03	1.111E-06	6.860E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	4.644E-08	7.009E-03	9.602E-07	7.010E-03	9.480E-04
9000	1.000E-00	1.000E-00	7.159E-03	4.171E-08	7.159E-03	8.382E-07	7.160E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	3.737E-08	7.307E-03	7.298E-07	7.308E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	3.379E-08	7.458E-03	6.412E-07	7.459E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	3.045E-08	7.609E-03	5.752E-07	7.609E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	2.784E-08	7.759E-03	4.995E-07	7.759E-03	1.049E-03
10000	1.000E-00	1.000E-00	7.909E-03	2.484E-08	7.909E-03	4.352E-07	7.910E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

$10^{-1.5}$ atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
6.105E 01	6.610E 01	4.679E 01	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
1.505E 02	1.564E 02	1.104E 02	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
2.742E 02	2.825E 02	1.950E 02	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
5.205E 02	5.410E 02	3.556E 02	-1.053E-09	1.815E-05	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
7.238E 02	7.582E 02	4.861E 02	-8.774E-08	1.105E-03	7.406E 00	6.827E-01	6.828E-01	1.483E 00	4.603E-01
9.572E 02	1.011E 03	6.361E 02	-2.007E-06	2.016E-02	7.630E 00	6.807E-01	6.817E-01	1.522E 00	4.479E-01
1.221E 03	1.296E 03	8.056E 02	-2.160E-05	1.740E-01	7.986E 00	6.717E-01	6.798E-01	1.553E 00	4.377E-01
1.514E 03	1.610E 03	9.933E 02	-1.334E-04	9.114E-01	8.907E 00	6.408E-01	6.783E-01	1.572E 00	4.314E-01
1.837E 03	1.964E 03	1.202E 03	-5.805E-04	3.363E 00	1.151E 01	5.767E-01	6.758E-01	1.587E 00	4.257E-01
2.190E 03	2.348E 03	1.433E 03	-1.811E-03	9.567E 00	1.779E 01	5.129E-01	6.723E-01	1.578E 00	4.260E-01
2.570E 03	2.768E 03	1.683E 03	-4.563E-03	2.214E 01	3.030E 01	4.815E-01	6.684E-01	1.531E 00	4.364E-01
2.981E 03	3.216E 03	1.950E 03	-8.485E-03	4.255E 01	5.043E 01	4.851E-01	6.622E-01	1.433E 00	4.622E-01
3.420E 03	3.701E 03	2.238E 03	-1.188E-02	6.692E 01	7.425E 01	5.161E-01	6.525E-01	1.293E 00	5.045E-01
3.890E 03	4.214E 03	2.541E 03	-1.145E-02	8.125E 01	8.784E 01	5.593E-01	6.409E-01	1.158E 00	5.536E-01
4.385E 03	4.762E 03	2.864E 03	-7.774E-03	7.015E 01	7.604E 01	5.996E-01	6.380E-01	1.069E 00	5.966E-01
4.908E 03	5.343E 03	3.205E 03	-3.989E-03	4.307E 01	4.849E 01	6.287E-01	6.459E-01	1.031E 00	6.266E-01
5.464E 03	5.955E 03	3.566E 03	-1.887E-03	2.114E 01	2.632E 01	6.457E-01	6.550E-01	1.018E 00	6.434E-01
6.046E 03	6.598E 03	3.940E 03	-8.520E-04	9.793E 00	1.486E 01	6.542E-01	6.606E-01	1.015E 00	6.510E-01
6.656E 03	7.298E 03	4.330E 03	-4.002E-04	4.538E 00	9.557E 00	6.580E-01	6.635E-01	1.018E 00	6.520E-01
7.296E 03	7.997E 03	4.749E 03	-1.936E-04	2.188E 00	7.182E 00	6.615E-01	6.649E-01	1.017E 00	6.538E-01
7.962E 03	8.772E 03	5.184E 03	-1.024E-04	1.108E 00	6.090E 00	6.631E-01	6.657E-01	1.022E 00	6.515E-01
8.659E 03	9.537E 03	5.636E 03	-5.556E-05	5.910E-01	5.567E 00	6.645E-01	6.661E-01	1.022E 00	6.519E-01
9.386E 03	1.036E 04	6.102E 03	-3.263E-05	3.278E-01	5.301E 00	6.653E-01	6.663E-01	1.025E 00	6.501E-01
1.014E 04	1.121E 04	6.590E 03	-1.860E-05	1.902E-01	5.161E 00	6.658E-01	6.664E-01	1.027E 00	6.491E-01
1.092E 04	1.208E 04	7.103E 03	-1.123E-05	1.149E-01	5.085E 00	6.661E-01	6.665E-01	1.027E 00	6.491E-01
1.173E 04	1.302E 04	7.627E 03	-7.121E-06	7.166E-02	5.041E 00	6.662E-01	6.665E-01	1.030E 00	6.471E-01
1.257E 04	1.397E 04	8.162E 03	-4.630E-06	4.609E-02	5.015E 00	6.664E-01	6.666E-01	1.032E 00	6.460E-01
1.344E 04	1.497E 04	8.734E 03	-3.079E-06	3.045E-02	4.999E 00	6.664E-01	6.666E-01	1.034E 00	6.444E-01
1.434E 04	1.598E 04	9.300E 03	-2.086E-06	2.063E-02	4.989E 00	6.665E-01	6.666E-01	1.035E 00	6.441E-01
1.526E 04	1.703E 04	9.904E 03	-1.353E-06	1.428E-02	4.982E 00	6.665E-01	6.666E-01	1.036E 00	6.433E-01
1.621E 04	1.812E 04	1.053E 04	-9.304E-07	1.011E-02	4.978E 00	6.666E-01	6.666E-01	1.038E 00	6.422E-01
1.719E 04	1.927E 04	1.119E 04	-6.475E-07	7.339E-03	4.975E 00	6.666E-01	6.666E-01	1.040E 00	6.408E-01
1.820E 04	2.040E 04	1.185E 04	-4.539E-07	5.437E-03	4.973E 00	6.666E-01	6.666E-01	1.041E 00	6.405E-01
1.924E 04	2.164E 04	1.253E 04	-3.046E-07	4.133E-03	4.972E 00	6.666E-01	6.666E-01	1.044E 00	6.385E-01
2.030E 04	2.287E 04	1.327E 04	-2.286E-07	3.185E-03	4.971E 00	6.666E-01	6.666E-01	1.045E 00	6.376E-01
2.139E 04	2.421E 04	1.398E 04	-1.737E-07	2.489E-03	4.970E 00	6.666E-01	6.666E-01	1.050E 00	6.350E-01
2.253E 04	2.553E 04	1.474E 04	-1.138E-07	1.971E-03	4.970E 00	6.666E-01	6.666E-01	1.052E 00	6.336E-01
2.368E 04	2.698E 04	1.548E 04	-7.874E-08	1.588E-03	4.969E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
2.485E 04	2.834E 04	1.626E 04	-5.334E-08	1.301E-03	4.969E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
2.607E 04	2.982E 04	1.708E 04	-3.442E-08	1.080E-03	4.969E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
2.730E 04	3.136E 04	1.792E 04	-1.994E-08	8.942E-04	4.968E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
2.857E 04	3.295E 04	1.875E 04	-9.260E-09	7.524E-04	4.968E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
2.987E 04	3.461E 04	1.960E 04	-4.542E-09	6.336E-04	4.968E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
3.121E 04	3.632E 04	2.052E 04	-9.852E-10	5.390E-04	4.968E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
3.255E 04	3.799E 04	2.139E 04	4.257E-09	4.586E-04	4.968E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
3.395E 04	3.984E 04	2.232E 04	8.173E-09	3.926E-04	4.968E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
3.536E 04	4.162E 04	2.328E 04	1.101E-08	4.041E-04	4.968E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
3.681E 04	4.360E 04	2.427E 04	1.313E-08	2.913E-04	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
3.828E 04	4.551E 04	2.528E 04	1.280E-08	2.481E-04	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(g) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	3.595E-09	7.190E-09	7.390E-04	3.083E-04	1.047E-03	2.128E-09	1.047E-03	1.999E-04
1200	3.122E-07	6.245E-07	8.353E-04	3.803E-04	1.216E-03	1.514E-07	1.216E-03	2.260E-04
1400	7.681E-06	1.536E-05	9.286E-04	4.625E-04	1.391E-03	3.154E-06	1.394E-03	2.512E-04
1600	8.591E-05	1.718E-04	1.018E-03	5.518E-04	1.570E-03	3.055E-05	1.600E-03	2.754E-04
1800	5.657E-04	1.131E-03	1.108E-03	6.446E-04	1.752E-03	1.768E-04	1.929E-03	2.995E-04
2000	2.569E-03	5.124E-03	1.199E-03	7.399E-04	1.939E-03	7.170E-04	2.656E-03	3.231E-04
2200	8.889E-03	1.762E-02	1.300E-03	8.335E-04	2.134E-03	2.229E-03	4.363E-03	3.471E-04
2400	2.509E-02	4.896E-02	1.430E-03	9.150E-04	2.345E-03	5.650E-03	7.995E-03	3.727E-04
2600	6.045E-02	1.140E-01	1.608E-03	9.687E-04	2.577E-03	1.205E-02	1.462E-02	3.992E-04
2800	1.279E-01	2.269E-01	1.863E-03	9.735E-04	2.837E-03	2.191E-02	2.474E-02	4.264E-04
3000	2.417E-01	3.893E-01	2.186E-03	9.003E-04	3.087E-03	3.345E-02	3.654E-02	4.468E-04
3200	4.052E-01	5.767E-01	2.531E-03	7.404E-04	3.272E-03	4.111E-02	4.438E-02	4.543E-04
3400	5.934E-01	7.448E-01	2.829E-03	5.264E-04	3.356E-03	3.863E-02	4.198E-02	4.522E-04
3600	7.592E-01	8.631E-01	3.064E-03	3.244E-04	3.388E-03	2.756E-02	3.095E-02	4.523E-04
3800	8.673E-01	9.289E-01	3.252E-03	1.873E-04	3.439E-03	1.639E-02	1.983E-02	4.600E-04
4000	9.291E-01	9.632E-01	3.420E-03	1.056E-04	3.526E-03	8.918E-03	1.244E-02	4.733E-04
4200	9.615E-01	9.804E-01	3.578E-03	6.033E-05	3.638E-03	4.750E-03	8.388E-03	4.898E-04
4400	9.784E-01	9.891E-01	3.732E-03	3.583E-05	3.768E-03	2.593E-03	6.361E-03	5.082E-04
4600	9.873E-01	9.936E-01	3.882E-03	2.207E-05	3.905E-03	1.461E-03	5.366E-03	5.272E-04
4800	9.923E-01	9.962E-01	4.032E-03	1.406E-05	4.046E-03	8.512E-04	4.897E-03	5.467E-04
5000	9.952E-01	9.976E-01	4.181E-03	9.304E-06	4.190E-03	5.156E-04	4.706E-03	5.664E-04
5200	9.968E-01	9.984E-01	4.331E-03	6.367E-06	4.337E-03	3.237E-04	4.661E-03	5.864E-04
5400	9.979E-01	9.989E-01	4.480E-03	4.487E-06	4.485E-03	2.098E-04	4.694E-03	6.064E-04
5600	9.985E-01	9.993E-01	4.629E-03	3.243E-06	4.632E-03	1.398E-04	4.772E-03	6.264E-04
5800	9.990E-01	9.995E-01	4.776E-03	2.400E-06	4.779E-03	9.560E-05	4.874E-03	6.463E-04
6000	9.992E-01	9.996E-01	4.926E-03	1.813E-06	4.927E-03	6.688E-05	4.994E-03	6.664E-04
6200	9.995E-01	9.997E-01	5.074E-03	1.364E-06	5.075E-03	4.776E-05	5.123E-03	6.865E-04
6400	9.996E-01	9.998E-01	5.223E-03	1.056E-06	5.224E-03	3.487E-05	5.259E-03	7.066E-04
6600	9.997E-01	9.998E-01	5.372E-03	8.337E-07	5.372E-03	2.609E-05	5.399E-03	7.267E-04
6800	9.998E-01	9.999E-01	5.519E-03	6.672E-07	5.520E-03	1.987E-05	5.539E-03	7.466E-04
7000	9.998E-01	9.999E-01	5.669E-03	5.456E-07	5.669E-03	1.557E-05	5.685E-03	7.668E-04
7200	9.998E-01	9.999E-01	5.816E-03	4.500E-07	5.816E-03	1.232E-05	5.829E-03	7.868E-04
7400	9.999E-01	9.999E-01	5.965E-03	3.786E-07	5.965E-03	9.921E-06	5.975E-03	8.069E-04
7600	9.999E-01	1.000E-00	6.114E-03	3.203E-07	6.114E-03	8.069E-06	6.122E-03	8.270E-04
7800	9.999E-01	1.000E-00	6.263E-03	2.752E-07	6.264E-03	6.694E-06	6.270E-03	8.473E-04
8000	9.999E-01	1.000E-00	6.412E-03	2.384E-07	6.412E-03	5.613E-06	6.418E-03	8.673E-04
8200	9.999E-01	1.000E-00	6.560E-03	2.099E-07	6.560E-03	4.784E-06	6.565E-03	8.874E-04
8400	9.999E-01	1.000E-00	6.709E-03	1.845E-07	6.709E-03	4.067E-06	6.713E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	1.647E-07	6.859E-03	3.512E-06	6.863E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	1.468E-07	7.009E-03	3.036E-06	7.012E-03	9.481E-04
9000	1.000E-00	1.000E-00	7.159E-03	1.319E-07	7.159E-03	2.650E-06	7.162E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	1.181E-07	7.307E-03	2.306E-06	7.310E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	1.068E-07	7.459E-03	2.027E-06	7.461E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	9.625E-08	7.609E-03	2.134E-06	7.611E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	8.794E-08	7.759E-03	1.578E-06	7.760E-03	1.050E-03
10000	1.000E-00	1.000E-00	7.909E-03	7.849E-08	7.909E-03	1.375E-06	7.911E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^{-1} atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E 01	2.090E 01	1.480E 01	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E 01	4.945E 01	3.490E 01	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E 01	8.933E 01	6.165E 01	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E 02	1.711E 02	1.124E 02	-5.920E-10	1.020E-05	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E 02	2.398E 02	1.537E 02	-4.934E-08	6.216E-04	7.405E 00	6.827E-01	6.828E-01	1.483E 00	4.603E-01
3.027E 02	3.196E 02	2.012E 02	-1.129E-06	1.134E-02	7.621E 00	6.811E-01	6.817E-01	1.522E 00	4.479E-01
3.860E 02	4.098E 02	2.547E 02	-1.215E-05	9.787E-02	7.910E 00	6.752E-01	6.798E-01	1.553E 00	4.377E-01
4.789E 02	5.092E 02	3.141E 02	-7.511E-05	5.128E-01	8.511E 00	6.557E-01	6.783E-01	1.573E 00	4.312E-01
5.810E 02	6.210E 02	3.801E 02	-3.285E-04	1.895E 00	1.005E 01	6.081E-01	6.759E-01	1.592E 00	4.246E-01
6.924E 02	7.426E 02	4.531E 02	-1.041E-03	5.418E 00	1.368E 01	5.449E-01	6.729E-01	1.593E 00	4.223E-01
8.128E 02	8.753E 02	5.321E 02	-2.728E-03	1.271E 01	2.100E 01	4.978E-01	6.699E-01	1.571E 00	4.264E-01
9.426E 02	1.017E 03	6.165E 02	-5.532E-03	2.527E 01	3.344E 01	4.802E-01	6.657E-01	1.511E 00	4.405E-01
1.081E 03	1.170E 03	7.077E 02	-9.134E-03	4.301E 01	5.085E 01	4.904E-01	6.599E-01	1.409E 00	4.685E-01
1.230E 03	1.333E 03	8.035E 02	-1.148E-02	6.180E 01	6.910E 01	5.204E-01	6.508E-01	1.280E 00	5.084E-01
1.387E 03	1.506E 03	9.055E 02	-1.094E-02	7.169E 01	7.831E 01	5.587E-01	6.408E-01	1.161E 00	5.522E-01
1.552E 03	1.690E 03	1.014E 03	-7.742E-03	6.379E 01	6.977E 01	5.941E-01	6.375E-01	1.080E 00	5.903E-01
1.728E 03	1.883E 03	1.128E 03	-4.603E-03	4.324E 01	4.876E 01	6.218E-01	6.434E-01	1.039E 00	6.191E-01
1.912E 03	2.086E 03	1.246E 03	-2.357E-03	2.450E 01	2.976E 01	6.393E-01	6.517E-01	1.023E 00	6.367E-01
2.105E 03	2.308E 03	1.369E 03	-1.182E-03	1.268E 01	1.781E 01	6.481E-01	6.579E-01	1.021E 00	6.442E-01
2.307E 03	2.529E 03	1.502E 03	-5.902E-04	6.473E 00	1.152E 01	6.548E-01	6.617E-01	1.019E 00	6.496E-01
2.518E 03	2.774E 03	1.639E 03	-3.173E-04	3.375E 00	8.390E 00	6.578E-01	6.638E-01	1.023E 00	6.491E-01
2.738E 03	3.016E 03	1.782E 03	-1.736E-04	1.829E 00	6.824E 00	6.610E-01	6.649E-01	1.022E 00	6.505E-01
2.968E 03	3.278E 03	1.930E 03	-1.025E-04	1.023E 00	6.007E 00	6.627E-01	6.656E-01	1.025E 00	6.493E-01
3.206E 03	3.546E 03	2.084E 03	-5.856E-05	5.965E-01	5.575E 00	6.641F-01	6.660E-01	1.027E 00	6.486E-01
3.454E 03	3.820E 03	2.246E 03	-3.539E-05	3.615E-01	5.336E 00	6.650E-01	6.662E-01	1.027E 00	6.487E-01
3.709E 03	4.117E 03	2.412E 03	-2.247E-05	2.258E-01	5.198E 00	6.655E-01	6.663E-01	1.030E 00	6.469E-01
3.974E 03	4.418E 03	2.581E 03	-1.462E-05	1.454E-01	5.116E 00	6.658E-01	6.664E-01	1.032E 00	6.458E-01
4.249E 03	4.734E 03	2.762E 03	-9.727E-06	9.611E-02	5.066E 00	6.660E-01	6.665E-01	1.034E 00	6.443E-01
4.535E 03	5.053E 03	2.941E 03	-6.591E-06	6.516E-02	5.034E 00	6.662E-01	6.665E-01	1.035E 00	6.440E-01
4.824E 03	5.385E 03	3.132E 03	-4.277E-06	4.512E-02	5.014E 00	6.663E-01	6.665E-01	1.036E 00	6.432E-01
5.125E 03	5.732E 03	3.331E 03	-2.941E-06	3.195E-02	5.000E 00	6.664E-01	6.666E-01	1.038E 00	6.422E-01
5.435E 03	6.093E 03	3.538E 03	-2.047E-06	2.320E-02	4.991E 00	6.665E-01	6.666E-01	1.040E 00	6.408E-01
5.755E 03	6.452E 03	3.747E 03	-1.435E-06	1.719E-02	4.985E 00	6.665E-01	6.666E-01	1.041E 00	6.405E-01
6.084E 03	6.843E 03	3.963E 03	-9.631E-07	1.307E-02	4.981E 00	6.665E-01	6.666E-01	1.044E 00	6.385E-01
6.418E 03	7.232E 03	4.196E 03	-7.227E-07	1.007E-02	4.978E 00	6.665E-01	6.666E-01	1.045E 00	6.376E-01
6.766E 03	7.655E 03	4.421E 03	-5.493E-07	7.870E-03	4.976E 00	6.665E-01	6.666E-01	1.050E 00	6.350E-01
7.124E 03	8.075E 03	4.663E 03	-3.597E-07	6.232E-03	4.974E 00	6.666E-01	6.666E-01	1.052E 00	6.336E-01
7.488E 03	8.533E 03	4.895E 03	-2.490E-07	5.021E-03	4.973E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
7.860E 03	8.962E 03	5.143E 03	-1.686E-07	4.112E-03	4.972E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
8.243E 03	9.430E 03	5.400E 03	-1.088E-07	3.414E-03	4.971E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
8.634E 03	9.916E 03	5.666E 03	-6.304E-08	2.827E-03	4.970E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
9.034E 03	1.042E 04	5.928E 03	-2.928E-08	2.379E-03	4.970E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
9.445E 03	1.094E 04	6.199E 03	-1.436E-08	2.003E-03	4.970E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
9.870E 03	1.149E 04	6.490E 03	-3.115E-09	1.704E-03	4.969E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
1.029E 04	1.201E 04	6.763E 03	1.345E-08	1.449E-03	4.969E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
1.073E 04	1.260E 04	7.058E 03	2.584E-08	1.241E-03	4.969E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
1.118E 04	1.316E 04	7.361E 03	3.480E-08	1.278E-03	4.969E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
1.164E 04	1.379E 04	7.674F 03	4.147E-08	9.203E-04	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
1.210E 04	1.439E 04	7.995E 03	4.046E-08	7.839E-04	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(h) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	2.022E-08	4.043E-08	7.390E-04	3.083E-04	1.047E-03	1.196E-08	1.047E-03	1.999E-04
1200	1.756E-06	3.512E-06	8.353E-04	3.803E-04	1.216E-03	8.511E-07	1.216E-03	2.260E-04
1400	4.319E-05	8.638E-05	9.286E-04	4.625E-04	1.391E-03	1.774E-05	1.409E-03	2.512E-04
1600	4.831E-04	9.657E-04	1.019E-03	5.515E-04	1.570E-03	1.717E-04	1.742E-03	2.754E-04
1800	3.181E-03	6.342E-03	1.113E-03	6.425E-04	1.755E-03	9.914E-04	2.747E-03	2.997E-04
2000	1.444E-02	2.847E-02	1.224E-03	7.291E-04	1.953E-03	3.984E-03	5.936E-03	3.241E-04
2200	4.993E-02	9.511E-02	1.390E-03	7.918E-04	2.182E-03	1.200E-02	1.418E-02	3.503E-04
2400	1.398E-01	2.452E-01	1.665E-03	7.880E-04	2.453E-03	2.777E-02	3.022E-02	3.769E-04
2600	3.224E-01	4.876E-01	2.039E-03	6.623E-04	2.701E-03	4.634E-02	4.904E-02	3.900E-04
2800	5.872E-01	7.399E-01	2.391E-03	4.214E-04	2.813E-03	4.759E-02	5.040E-02	3.839E-04
3000	8.139E-01	8.974E-01	2.637E-03	1.987E-04	2.836E-03	2.765E-02	3.048E-02	3.808E-04
3200	9.281E-01	9.627E-01	2.819E-03	8.155E-05	2.900E-03	1.139E-02	1.429E-02	3.903E-04
3400	9.721E-01	9.859E-01	2.979E-03	3.381E-05	3.013E-03	4.339E-03	7.352E-03	4.066E-04
3600	9.886E-01	9.943E-01	3.134E-03	1.480E-05	3.149E-03	1.702E-03	4.851E-03	4.255E-04
3800	9.948E-01	9.974E-01	3.285E-03	7.143E-06	3.292E-03	7.324E-04	4.025E-03	4.451E-04
4000	9.975E-01	9.988E-01	3.436E-03	3.678E-06	3.440E-03	3.371E-04	3.777E-03	4.652E-04
4200	9.987E-01	9.994E-01	3.586E-03	2.008E-06	3.588E-03	1.652E-04	3.753E-03	4.853E-04
4400	9.993E-01	9.996E-01	3.736E-03	1.166E-06	3.738E-03	8.646E-05	3.824E-03	5.055E-04
4600	9.996E-01	9.998E-01	3.885E-03	7.097E-07	3.886E-03	4.765E-05	3.934E-03	5.256E-04
4800	9.998E-01	9.999E-01	4.034E-03	4.492E-07	4.034E-03	2.743E-05	4.062E-03	5.457E-04
5000	9.998E-01	9.999E-01	4.182E-03	2.961E-07	4.182E-03	1.650E-05	4.199E-03	5.657E-04
5200	9.999E-01	9.999E-01	4.331E-03	2.022E-07	4.332E-03	1.031E-05	4.342E-03	5.859E-04
5400	9.999E-01	1.000E-00	4.481E-03	1.423E-07	4.481E-03	6.668E-06	4.488E-03	6.061E-04
5600	1.000E-00	1.000E-00	4.629E-03	1.027E-07	4.629E-03	4.436E-06	4.634E-03	6.262E-04
5800	1.000E-00	1.000E-00	4.777E-03	7.601E-08	4.777E-03	3.031E-06	4.780E-03	6.462E-04
6000	1.000E-00	1.000E-00	4.926E-03	5.737E-08	4.926E-03	2.118E-06	4.928E-03	6.663E-04
6200	1.000E-00	1.000E-00	5.074E-03	4.317E-08	5.074E-03	1.513E-06	5.076E-03	6.864E-04
6400	1.000E-00	1.000E-00	5.223E-03	3.343E-08	5.223E-03	1.104E-06	5.224E-03	7.065E-04
6600	1.000E-00	1.000E-00	5.372E-03	2.637E-08	5.372E-03	8.257E-07	5.373E-03	7.266E-04
6800	1.000E-00	1.000E-00	5.519E-03	2.111E-08	5.519E-03	6.290E-07	5.520E-03	7.466E-04
7000	1.000E-00	1.000E-00	5.669E-03	1.726E-08	5.669E-03	4.926E-07	5.669E-03	7.668E-04
7200	1.000E-00	1.000E-00	5.816E-03	1.423E-08	5.816E-03	3.897E-07	5.816E-03	7.867E-04
7400	1.000E-00	1.000E-00	5.965E-03	1.198E-08	5.965E-03	3.141E-07	5.965E-03	8.069E-04
7600	1.000E-00	1.000E-00	6.114E-03	1.015E-08	6.114E-03	2.556E-07	6.114E-03	8.270E-04
7800	1.000E-00	1.000E-00	6.263E-03	8.708E-09	6.263E-03	2.119E-07	6.264E-03	8.472E-04
8000	1.000E-00	1.000E-00	6.412E-03	7.545E-09	6.412E-03	1.777E-07	6.412E-03	8.673E-04
8200	1.000E-00	1.000E-00	6.560E-03	6.661E-09	6.560E-03	1.518E-07	6.560E-03	8.874E-04
8400	1.000E-00	1.000E-00	6.709E-03	5.845E-09	6.709E-03	1.289E-07	6.709E-03	9.076E-04
8600	1.000E-00	1.000E-00	6.859E-03	5.221E-09	6.859E-03	1.113E-07	6.859E-03	9.278E-04
8800	1.000E-00	1.000E-00	7.009E-03	4.664E-09	7.009E-03	9.645E-08	7.009E-03	9.480E-04
9000	1.000E-00	1.000E-00	7.159E-03	4.186E-09	7.159E-03	8.413E-08	7.159E-03	9.684E-04
9200	1.000E-00	1.000E-00	7.307E-03	3.753E-09	7.307E-03	7.329E-08	7.307E-03	9.884E-04
9400	1.000E-00	1.000E-00	7.458E-03	3.395E-09	7.458E-03	6.442E-08	7.458E-03	1.009E-03
9600	1.000E-00	1.000E-00	7.609E-03	3.068E-09	7.609E-03	5.803E-08	7.609E-03	1.029E-03
9800	1.000E-00	1.000E-00	7.759E-03	2.794E-09	7.759E-03	5.013E-08	7.759E-03	1.049E-03
10000	1.000E-00	1.000E-00	7.909E-03	2.491E-09	7.909E-03	4.364E-08	7.909E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

$10^{-0.5}$ atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
6.105E 02	6.610E 02	4.679E 02	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
1.505E 03	1.564E 03	1.104E 03	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
2.742E 03	2.825E 03	1.950E 03	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
5.205E 03	5.410E 03	3.556E 03	-3.329E-09	5.739E-05	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
7.238E 03	7.582E 03	4.861E 03	-2.775E-07	3.496E-03	7.408E 00	6.826E-01	6.828E-01	1.483E 00	4.603E-01
9.572E 03	1.011E 04	6.361E 03	-6.346E-06	6.375E-02	7.673E 00	6.787E-01	6.817E-01	1.522E 00	4.479E-01
1.221E 04	1.296E 04	8.056E 03	-6.823E-05	5.501E-01	8.360E 00	6.559E-01	6.798E-01	1.552E 00	4.379E-01
1.514E 04	1.610E 04	9.933E 03	-4.189E-04	2.876E 00	1.086E 01	5.895E-01	6.781E-01	1.567E 00	4.326E-01
1.837E 04	1.964E 04	1.202E 04	-1.780E-03	1.053E 01	1.861E 01	5.112E-01	6.748E-01	1.566E 00	4.310E-01
2.190E 04	2.348E 04	1.433E 04	-5.146E-03	2.917E 01	3.718E 01	4.783E-01	6.694E-01	1.509E 00	4.435E-01
2.570E 04	2.768E 04	1.683E 04	-1.066E-02	6.248E 01	7.008E 01	4.942E-01	6.606E-01	1.378E 00	4.795E-01
2.981E 04	3.216E 04	1.950E 04	-1.311E-02	9.721E 01	1.040E 02	5.427E-01	6.458E-01	1.203E 00	5.366E-01
3.420E 04	3.701E 04	2.238E 04	-9.274E-03	9.343E 01	9.937E 01	5.958E-01	6.378E-01	1.075E 00	5.934E-01
3.890E 04	4.214E 04	2.541E 04	-4.046E-03	5.107E 01	5.643E 01	6.343E-01	6.475E-01	1.023E 00	6.329E-01
4.385E 04	4.762E 04	2.864E 04	-1.481E-03	1.986E 01	2.497E 01	6.523E-01	6.580E-01	1.011E 00	6.509E-01
4.908E 04	5.343E 04	3.205E 04	-5.360E-04	7.165E 00	1.219E 01	6.594E-01	6.631E-01	1.010E 00	6.568E-01
5.464E 04	5.955E 04	3.566E 04	-2.152E-04	2.670E 00	7.661E 00	6.627E-01	6.651E-01	1.010E 00	6.583E-01
6.046E 04	6.598E 04	3.940E 04	-9.060E-05	1.095E 00	6.073E 00	6.645E-01	6.659E-01	1.012E 00	6.582E-01
6.656E 04	7.298E 04	4.330E 04	-4.124E-05	4.794E-01	5.452E 00	6.653E-01	6.663E-01	1.016E 00	6.556E-01
7.296E 04	7.997E 04	4.749E 04	-1.966E-05	2.251E-01	5.195E 00	6.660E-01	6.664E-01	1.016E 00	6.557E-01
7.962E 04	8.772E 04	5.184E 04	-1.033E-05	1.125E-01	5.082E 00	6.662E-01	6.665E-01	1.021E 00	6.525E-01
8.659E 04	9.537E 04	5.636E 04	-5.583E-06	5.964E-02	5.028E 00	6.664E-01	6.666E-01	1.022E 00	6.525E-01
9.386E 04	1.036E 05	6.102E 04	-3.273E-06	3.296E-02	5.001E 00	6.665E-01	6.666E-01	1.025E 00	6.505E-01
1.014E 05	1.121E 05	6.590E 04	-1.864E-06	1.909E-02	4.987E 00	6.665E-01	6.666E-01	1.027E 00	6.493E-01
1.092E 05	1.208E 05	7.103E 04	-1.124E-06	1.152E-02	4.979E 00	6.666E-01	6.666E-01	1.027E 00	6.492E-01
1.173E 05	1.302E 05	7.627E 04	-7.127E-07	7.177E-03	4.975E 00	6.666E-01	6.666E-01	1.030E 00	6.472E-01
1.257E 05	1.397E 05	8.162E 04	-4.633E-07	4.613E-03	4.972E 00	6.666E-01	6.666E-01	1.032E 00	6.461E-01
1.344E 05	1.497E 05	8.734E 04	-3.081E-07	3.047E-03	4.971E 00	6.666E-01	6.666E-01	1.034E 00	6.444E-01
1.434E 05	1.598E 05	9.300E 04	-2.086E-07	2.064E-03	4.970E 00	6.666E-01	6.666E-01	1.035E 00	6.441E-01
1.526E 05	1.703E 05	9.904E 04	-1.354E-07	1.429E-03	4.969E 00	6.666E-01	6.666E-01	1.036E 00	6.433E-01
1.621E 05	1.812E 05	1.053E 05	-9.309E-08	1.012E-03	4.969E 00	6.666E-01	6.666E-01	1.038E 00	6.422E-01
1.719E 05	1.927E 05	1.119E 05	-6.476E-08	7.340E-04	4.968E 00	6.666E-01	6.666E-01	1.040E 00	6.408E-01
1.820E 05	2.040E 05	1.185E 05	-4.541E-08	5.440E-04	4.968E 00	6.666E-01	6.666E-01	1.041E 00	6.405E-01
1.924E 05	2.164E 05	1.253E 05	-3.047E-08	4.135E-04	4.968E 00	6.666E-01	6.666E-01	1.044E 00	6.385E-01
2.030E 05	2.287E 05	1.327E 05	-2.285E-08	3.184E-04	4.968E 00	6.666E-01	6.666E-01	1.045E 00	6.376E-01
2.139E 05	2.421E 05	1.398E 05	-1.739E-08	2.491E-04	4.968E 00	6.666E-01	6.666E-01	1.050E 00	6.350E-01
2.253E 05	2.553E 05	1.474E 05	-1.139E-08	1.974E-04	4.968E 00	6.666E-01	6.666E-01	1.052E 00	6.337E-01
2.368E 05	2.698E 05	1.548E 05	-7.879E-09	1.589E-04	4.968E 00	6.666E-01	6.666E-01	1.057E 00	6.305E-01
2.485E 05	2.834E 05	1.626E 05	-5.338E-09	1.302E-04	4.968E 00	6.666E-01	6.666E-01	1.058E 00	6.303E-01
2.607E 05	2.982E 05	1.708E 05	-3.453E-09	1.083E-04	4.968E 00	6.666E-01	6.666E-01	1.061E 00	6.282E-01
2.730E 05	3.136E 05	1.792E 05	-1.998E-09	8.959E-05	4.968E 00	6.666E-01	6.666E-01	1.065E 00	6.259E-01
2.857E 05	3.295E 05	1.875E 05	-9.280E-10	7.540E-05	4.968E 00	6.666E-01	6.666E-01	1.069E 00	6.234E-01
2.987E 05	3.461E 05	1.960E 05	-4.561E-10	6.364E-05	4.968E 00	6.666E-01	6.666E-01	1.074E 00	6.206E-01
3.121E 05	3.632E 05	2.052E 05	-9.887E-11	5.409E-05	4.968E 00	6.666E-01	6.666E-01	1.079E 00	6.177E-01
3.255E 05	3.799E 05	2.139E 05	4.274E-10	4.605E-05	4.968E 00	6.666E-01	6.666E-01	1.082E 00	6.162E-01
3.395E 05	3.984E 05	2.232E 05	8.212E-10	3.945E-05	4.968E 00	6.666E-01	6.666E-01	1.088E 00	6.129E-01
3.536E 05	4.162E 05	2.328E 05	1.109E-09	4.072E-05	4.968E 00	6.666E-01	6.666E-01	1.091E 00	6.111E-01
3.681E 05	4.360E 05	2.427E 05	1.318E-09	2.924E-05	4.968E 00	6.666E-01	6.666E-01	1.098E 00	6.073E-01
3.828E 05	4.551E 05	2.528E 05	1.284E-09	2.488E-05	4.968E 00	6.666E-01	6.666E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(1) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	1.137E-09	2.274E-09	7.390E-04	3.083E-04	1.047E-03	6.728E-10	1.047E-03	1.999E-04
1200	9.874E-08	1.975E-07	8.353E-04	3.803E-04	1.216E-03	4.786E-08	1.216E-03	2.260E-04
1400	2.429E-06	4.858E-06	9.286E-04	4.625E-04	1.391E-03	9.974E-07	1.392E-03	2.512E-04
1600	2.717E-05	5.433E-05	1.018E-03	5.518E-04	1.570E-03	9.661E-06	1.579E-03	2.754E-04
1800	1.789E-04	3.577E-04	1.107E-03	6.449E-04	1.752E-03	5.592E-05	1.808E-03	2.994E-04
2000	8.122E-04	1.623E-03	1.195E-03	7.415E-04	1.937E-03	2.271E-04	2.164E-03	3.229E-04
2200	2.811E-03	5.606E-03	1.286E-03	8.397E-04	2.126E-03	7.092E-04	2.835E-03	3.465E-04
2400	7.937E-03	1.575E-02	1.388E-03	9.346E-04	2.322E-03	1.819E-03	4.141E-03	3.708E-04
2600	1.915E-02	3.757E-02	1.505E-03	1.020E-03	2.525E-03	3.984E-03	6.509E-03	3.953E-04
2800	4.076E-02	7.833E-02	1.656E-03	1.090E-03	2.747E-03	7.676E-03	1.042E-02	4.219E-04
3000	7.853E-02	1.456E-01	1.853E-03	1.130E-03	2.983E-03	1.321E-02	1.619E-02	4.488E-04
3200	1.388E-01	2.437E-01	2.107E-03	1.128E-03	3.235E-03	2.039E-02	2.362E-02	4.758E-04
3400	2.270E-01	3.701E-01	2.406E-03	1.071E-03	3.477E-03	2.809E-02	3.157E-02	4.977E-04
3600	3.461E-01	5.142E-01	2.725E-03	9.484E-04	3.674E-03	3.412E-02	3.780E-02	5.102E-04
3800	4.825E-01	6.510E-01	3.024E-03	7.801E-04	3.804E-03	3.556E-02	3.936E-02	5.150E-04
4000	6.220E-01	7.670E-01	3.284E-03	5.919E-04	3.876E-03	3.183E-02	3.570E-02	5.167E-04
4200	7.420E-01	8.519E-01	3.499E-03	4.192E-04	3.919E-03	2.458E-02	2.850E-02	5.202E-04
4400	8.315E-01	9.080E-01	3.687E-03	2.860E-04	3.973E-03	1.719E-02	2.117E-02	5.284E-04
4600	8.916E-01	9.427E-01	3.856E-03	1.919E-04	4.048E-03	1.130E-02	1.535E-02	5.405E-04
4800	9.305E-01	9.640E-01	4.016E-03	1.288E-04	4.145E-03	7.242E-03	1.139E-02	5.554E-04
5000	9.546E-01	9.768E-01	4.171E-03	8.793E-05	4.259E-03	4.645E-03	8.904E-03	5.723E-04
5200	9.697E-01	9.846E-01	4.324E-03	6.132E-05	4.385E-03	3.020E-03	7.406E-03	5.904E-04
5400	9.793E-01	9.896E-01	4.476E-03	4.374E-05	4.519E-03	2.002E-03	6.521E-03	6.093E-04
5600	9.856E-01	9.927E-01	4.626E-03	3.186E-05	4.657E-03	1.353E-03	6.010E-03	6.285E-04
5800	9.897E-01	9.948E-01	4.774E-03	2.370E-05	4.798E-03	9.341E-04	5.732E-03	6.478E-04
6000	9.925E-01	9.962E-01	4.924E-03	1.796E-05	4.942E-03	6.575E-04	5.599E-03	6.676E-04
6200	9.946E-01	9.973E-01	5.073E-03	1.355E-05	5.086E-03	4.718E-04	5.558E-03	6.873E-04
6400	9.959E-01	9.980E-01	5.222E-03	1.051E-05	5.232E-03	3.455E-04	5.578E-03	7.072E-04
6600	9.969E-01	9.985E-01	5.371E-03	8.306E-06	5.379E-03	2.591E-04	5.638E-03	7.272E-04
6800	9.976E-01	9.988E-01	5.518E-03	6.652E-06	5.525E-03	1.977E-04	5.723E-03	7.470E-04
7000	9.981E-01	9.991E-01	5.668E-03	5.443E-06	5.674E-03	1.550E-04	5.829E-03	7.672E-04
7200	9.985E-01	9.992E-01	5.816E-03	4.492E-06	5.820E-03	1.228E-04	5.943E-03	7.870E-04
7400	9.988E-01	9.994E-01	5.965E-03	3.780E-06	5.969E-03	9.894E-05	6.067E-03	8.071E-04
7600	9.990E-01	9.995E-01	6.113E-03	3.199E-06	6.117E-03	8.050E-05	6.197E-03	8.272E-04
7800	9.992E-01	9.996E-01	6.263E-03	2.749E-06	6.266E-03	6.681E-05	6.333E-03	8.474E-04
8000	9.993E-01	9.997E-01	6.412E-03	2.382E-06	6.414E-03	5.604E-05	6.470E-03	8.675E-04
8200	9.994E-01	9.997E-01	6.560E-03	2.098E-06	6.562E-03	4.777E-05	6.610E-03	8.875E-04
8400	9.995E-01	9.997E-01	6.709E-03	1.843E-06	6.711E-03	4.062E-05	6.752E-03	9.077E-04
8600	9.996E-01	9.998E-01	6.859E-03	1.646E-06	6.861E-03	3.508E-05	6.896E-03	9.279E-04
8800	9.996E-01	9.998E-01	7.008E-03	1.467E-06	7.010E-03	3.033E-05	7.040E-03	9.481E-04
9000	9.997E-01	9.998E-01	7.159E-03	1.318E-06	7.161E-03	2.648E-05	7.187E-03	9.685E-04
9200	9.997E-01	9.999E-01	7.307E-03	1.180E-06	7.308E-03	2.305E-05	7.331E-03	9.885E-04
9400	9.998E-01	9.999E-01	7.458E-03	1.068E-06	7.459E-03	2.025E-05	7.480E-03	1.009E-03
9600	9.998E-01	9.999E-01	7.608E-03	9.622E-07	7.609E-03	2.133E-05	7.631E-03	1.029E-03
9800	9.998E-01	9.999E-01	7.758E-03	8.792E-07	7.759E-03	1.577E-05	7.775E-03	1.050E-03
10000	9.998E-01	9.999E-01	7.909E-03	7.847E-07	7.910E-03	1.374E-05	7.924E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^0 atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E 00	2.090E 00	1.480E 00	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E 00	4.945E 00	3.490E 00	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E 00	8.933E 00	6.165E 00	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E 01	1.711E 01	1.124E 01	-1.872E-10	3.227E-06	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E 01	2.398E 01	1.537E 01	-1.560E-08	1.966E-04	7.405E 00	6.828E-01	6.828E-01	1.483E 00	4.603E-01
3.027E 01	3.196E 01	2.012E 01	-3.569E-07	3.585E-03	7.613E 00	6.815E-01	6.817E-01	1.522E 00	4.479E-01
3.860E 01	4.098E 01	2.547E 01	-3.842E-06	3.095E-02	7.843E 00	6.784E-01	6.798E-01	1.553E 00	4.376E-01
4.789E 01	5.092E 01	3.141E 01	-2.378E-05	1.622E-01	8.163E 00	6.707E-01	6.784E-01	1.574E 00	4.310E-01
5.810E 01	6.210E 01	3.801E 01	-1.044E-04	6.003E-01	8.768E 00	6.496E-01	6.761E-01	1.596E 00	4.237E-01
6.924E 01	7.426E 01	4.531E 01	-3.354E-04	1.724E 00	1.003E 01	6.098E-01	6.734E-01	1.607E 00	4.190E-01
8.128E 01	8.753E 01	5.321E 01	-9.103E-04	4.092E 00	1.250E 01	5.596E-01	6.712E-01	1.609E 00	4.172E-01
9.426E 01	1.017E 02	6.165E 01	-1.992E-03	8.358E 00	1.680E 01	5.160E-01	6.686E-01	1.595E 00	4.192E-01
1.081E 02	1.170E 02	7.077E 01	-3.811E-03	1.507E 01	2.347E 01	4.904E-01	6.659E-01	1.557E 00	4.276E-01
1.230E 02	1.333E 02	8.035E 01	-6.176E-03	2.440E 01	3.263E 01	4.839E-01	6.625E-01	1.494E 00	4.435E-01
1.387E 02	1.506E 02	9.055E 01	-8.666E-03	3.555E 01	4.347E 01	4.946E-01	6.581E-01	1.404E 00	4.687E-01
1.552E 02	1.690E 02	1.014E 02	-1.014E-02	4.640E 01	5.387E 01	5.169E-01	6.516E-01	1.303E 00	5.002E-01
1.728E 02	1.883E 02	1.128E 02	-1.045E-02	5.353E 01	6.047E 01	5.449E-01	6.435E-01	1.204E 00	5.343E-01
1.912E 02	2.086E 02	1.246E 02	-8.649E-03	5.314E 01	5.955E 01	5.730E-01	6.380E-01	1.127E 00	5.660E-01
2.105E 02	2.308E 02	1.369E 02	-6.269E-03	4.527E 01	5.121E 01	5.963E-01	6.375E-01	1.078E 00	5.912E-01
2.307E 02	2.529E 02	1.502E 02	-4.009E-03	3.350E 01	3.909E 01	6.167E-01	6.420E-01	1.048E 00	6.126E-01
2.518E 02	2.774E 02	1.639E 02	-2.511E-03	2.238E 01	2.774E 01	6.291E-01	6.481E-01	1.037E 00	6.248E-01
2.738E 02	3.016E 02	1.782E 02	-1.504E-03	1.415E 01	1.936E 01	6.397E-01	6.537E-01	1.030E 00	6.348E-01
2.968E 02	3.278E 02	1.930E 02	-9.374E-04	8.703E 00	1.383E 01	6.460E-01	6.578E-01	1.029E 00	6.392E-01
3.206E 02	3.546E 02	2.084E 02	-5.532E-04	5.375E 00	1.045E 01	6.509E-01	6.607E-01	1.029E 00	6.420E-01
3.454E 02	3.820E 02	2.246E 02	-3.409E-04	3.374E 00	8.410E 00	6.551E-01	6.626E-01	1.028E 00	6.443E-01
3.709E 02	4.117E 02	2.412E 02	-2.191E-04	2.154E 00	7.169E 00	6.577E-01	6.638E-01	1.031E 00	6.439E-01
3.974E 02	4.418E 02	2.581E 02	-1.437E-04	1.407E 00	6.408E 00	6.599E-01	6.646E-01	1.032E 00	6.438E-01
4.249E 02	4.734E 02	2.762E 02	-9.606E-05	9.390E-01	5.930E 00	6.615E-01	6.652E-01	1.035E 00	6.428E-01
4.535E 02	5.053E 02	2.941E 02	-6.531E-05	6.407E-01	5.626E 00	6.629E-01	6.656E-01	1.035E 00	6.429E-01
4.824E 02	5.385E 02	3.132E 02	-4.249E-05	4.457E-01	5.426E 00	6.639E-01	6.658E-01	1.036E 00	6.424E-01
5.125E 02	5.732E 02	3.331E 02	-2.927E-05	3.166E-01	5.294E 00	6.645E-01	6.660E-01	1.038E 00	6.416E-01
5.435E 02	6.093E 02	3.538E 02	-2.039E-05	2.303E-01	5.205E 00	6.650E-01	6.662E-01	1.040E 00	6.403E-01
5.755E 02	6.452E 02	3.747E 02	-1.431E-05	1.709E-01	5.144E 00	6.654E-01	6.663E-01	1.041E 00	6.401E-01
6.084E 02	6.843E 02	3.963E 02	-9.610E-06	1.301E-01	5.102E 00	6.656E-01	6.663E-01	1.044E 00	6.382E-01
6.418E 02	7.232E 02	4.196E 02	-7.214E-06	1.003E-01	5.072E 00	6.658E-01	6.664E-01	1.046E 00	6.374E-01
6.766E 02	7.655E 02	4.421E 02	-5.485E-06	7.848E-02	5.049E 00	6.659E-01	6.664E-01	1.050E 00	6.348E-01
7.124E 02	8.075E 02	4.663E 02	-3.593E-06	6.218E-02	5.032E 00	6.660E-01	6.665E-01	1.052E 00	6.335E-01
7.488E 02	8.533E 02	4.895E 02	-2.487E-06	5.011E-02	5.020E 00	6.661E-01	6.665E-01	1.057E 00	6.303E-01
7.860E 02	8.962E 02	5.143E 02	-1.685E-06	4.105E-02	5.010E 00	6.662E-01	6.665E-01	1.058E 00	6.302E-01
8.243E 02	9.430E 02	5.400E 02	-1.087E-06	3.409E-02	5.003E 00	6.663E-01	6.665E-01	1.061E 00	6.281E-01
8.634E 02	9.916E 02	5.666E 02	-6.300E-07	2.824E-02	4.997E 00	6.663E-01	6.665E-01	1.065E 00	6.258E-01
9.034E 02	1.042E 03	5.928E 02	-2.926E-07	2.376E-02	4.992E 00	6.663E-01	6.666E-01	1.069E 00	6.233E-01
9.445E 02	1.094E 03	6.199E 02	-1.435E-07	2.001E-02	4.988E 00	6.664E-01	6.666E-01	1.074E 00	6.206E-01
9.870E 02	1.149E 03	6.490E 02	-3.114E-08	1.703E-02	4.985E 00	6.664E-01	6.666E-01	1.079E 00	6.177E-01
1.029E 03	1.201E 03	6.763E 02	1.345E-07	1.448E-02	4.983E 00	6.664E-01	6.666E-01	1.082E 00	6.161E-01
1.073E 03	1.260E 03	7.058E 02	2.582E-07	1.240E-02	4.981E 00	6.664E-01	6.666E-01	1.088E 00	6.128E-01
1.118E 03	1.316E 03	7.361E 02	3.478E-07	1.277E-02	4.981E 00	6.664E-01	6.666E-01	1.091E 00	6.111E-01
1.164E 03	1.379E 03	7.674E 02	4.146E-07	9.199E-03	4.977E 00	6.665E-01	6.666E-01	1.098E 00	6.072E-01
1.210E 03	1.439E 03	7.995E 02	4.045E-07	7.836E-03	4.976E 00	6.665E-01	6.666E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(j) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	6.393E-10	1.279E-09	7.390E-04	3.083E-04	1.047E-03	3.783E-10	1.047E-03	1.999E-04
1200	5.553E-08	1.111E-07	8.353E-04	3.803E-04	1.216E-03	2.692E-08	1.216E-03	2.260E-04
1400	1.366E-06	2.732E-06	9.286E-04	4.625E-04	1.391E-03	5.609E-07	1.392E-03	2.512E-04
1600	1.528E-05	3.055E-05	1.018E-03	5.518E-04	1.570E-03	5.433E-06	1.575E-03	2.754E-04
1800	1.006E-04	2.012E-04	1.107E-03	6.449E-04	1.752E-03	3.145E-05	1.783E-03	2.994E-04
2000	4.568E-04	9.131E-04	1.194E-03	7.418E-04	1.936E-03	1.278E-04	2.064E-03	3.229E-04
2200	1.581E-03	3.157E-03	1.283E-03	8.410E-04	2.124E-03	3.993E-04	2.524E-03	3.464E-04
2400	4.463E-03	8.887E-03	1.379E-03	9.386E-04	2.317E-03	1.026E-03	3.344E-03	3.704E-04
2600	1.077E-02	2.131E-02	1.482E-03	1.031E-03	2.513E-03	2.260E-03	4.772E-03	3.943E-04
2800	2.293E-02	4.484E-02	1.607E-03	1.115E-03	2.722E-03	4.399E-03	7.121E-03	4.198E-04
3000	4.425E-02	8.476E-02	1.759E-03	1.180E-03	2.940E-03	7.720E-03	1.066E-02	4.457E-04
3200	7.856E-02	1.457E-01	1.955E-03	1.222E-03	3.177E-03	1.235E-02	1.553E-02	4.734E-04
3400	1.300E-01	2.301E-01	2.196E-03	1.228E-03	3.424E-03	1.810E-02	2.153E-02	5.004E-04
3600	2.031E-01	3.376E-01	2.477E-03	1.187E-03	3.664E-03	2.440E-02	2.807E-02	5.236E-04
3800	2.959E-01	4.567E-01	2.779E-03	1.098E-03	3.877E-03	2.967E-02	3.355E-02	5.410E-04
4000	4.079E-01	5.794E-01	3.080E-03	9.616E-04	4.041E-03	3.269E-02	3.673E-02	5.508E-04
4200	5.284E-01	6.914E-01	3.351E-03	7.941E-04	4.145E-03	3.199E-02	3.614E-02	5.547E-04
4400	6.439E-01	7.834E-01	3.587E-03	6.228E-04	4.210E-03	2.813E-02	3.234E-02	5.581E-04
4600	7.420E-01	8.519E-01	3.793E-03	4.674E-04	4.260E-03	2.238E-02	2.664E-02	5.637E-04
4800	8.192E-01	9.006E-01	3.976E-03	3.408E-04	4.317E-03	1.658E-02	2.090E-02	5.725E-04
5000	8.744E-01	9.330E-01	4.146E-03	2.462E-04	4.392E-03	1.177E-02	1.617E-02	5.846E-04
5200	9.126E-01	9.543E-01	4.307E-03	1.784E-04	4.486E-03	8.199E-03	1.268E-02	5.993E-04
5400	9.387E-01	9.684E-01	4.464E-03	1.305E-04	4.595E-03	5.691E-03	1.029E-02	6.157E-04
5600	9.564E-01	9.777E-01	4.618E-03	9.669E-05	4.714E-03	3.968E-03	8.682E-03	6.332E-04
5800	9.685E-01	9.840E-01	4.769E-03	7.276E-05	4.841E-03	2.798E-03	7.639E-03	6.514E-04
6000	9.769E-01	9.883E-01	4.920E-03	5.557E-05	4.975E-03	1.998E-03	6.974E-03	6.703E-04
6200	9.831E-01	9.915E-01	5.070E-03	4.217E-05	5.112E-03	1.449E-03	6.561E-03	6.893E-04
6400	9.873E-01	9.936E-01	5.219E-03	3.284E-05	5.252E-03	1.069E-03	6.321E-03	7.088E-04
6600	9.903E-01	9.951E-01	5.369E-03	2.603E-05	5.395E-03	8.060E-04	6.201E-03	7.284E-04
6800	9.925E-01	9.962E-01	5.517E-03	2.089E-05	5.538E-03	6.171E-04	6.155E-03	7.480E-04
7000	9.941E-01	9.970E-01	5.667E-03	1.712E-05	5.684E-03	4.852E-04	6.169E-03	7.680E-04
7200	9.953E-01	9.976E-01	5.815E-03	1.414E-05	5.829E-03	3.853E-04	6.214E-03	7.877E-04
7400	9.962E-01	9.981E-01	5.964E-03	1.191E-05	5.976E-03	3.108E-04	6.287E-03	8.077E-04
7600	9.969E-01	9.984E-01	6.113E-03	1.009E-05	6.123E-03	2.532E-04	6.376E-03	8.277E-04
7800	9.974E-01	9.987E-01	6.263E-03	8.671E-06	6.271E-03	2.103E-04	6.482E-03	8.478E-04
8000	9.978E-01	9.989E-01	6.411E-03	7.516E-06	6.419E-03	1.766E-04	6.595E-03	8.678E-04
8200	9.981E-01	9.991E-01	6.560E-03	6.622E-06	6.566E-03	1.506E-04	6.717E-03	8.878E-04
8400	9.984E-01	9.992E-01	6.709E-03	5.820E-06	6.715E-03	1.281E-04	6.843E-03	9.079E-04
8600	9.986E-01	9.993E-01	6.859E-03	5.198E-06	6.864E-03	1.107E-04	6.975E-03	9.282E-04
8800	9.988E-01	9.994E-01	7.008E-03	4.635E-06	7.013E-03	9.572E-05	7.109E-03	9.483E-04
9000	9.990E-01	9.995E-01	7.159E-03	4.164E-06	7.163E-03	8.360E-05	7.247E-03	9.687E-04
9200	9.991E-01	9.996E-01	7.307E-03	3.730E-06	7.311E-03	7.276E-05	7.383E-03	9.887E-04
9400	9.992E-01	9.996E-01	7.458E-03	3.374E-06	7.462E-03	6.396E-05	7.526E-03	1.009E-03
9600	9.993E-01	9.997E-01	7.608E-03	3.041E-06	7.611E-03	6.738E-05	7.679E-03	1.029E-03
9800	9.994E-01	9.997E-01	7.758E-03	2.779E-06	7.761E-03	4.983E-05	7.811E-03	1.050E-03
10000	9.995E-01	9.997E-01	7.909E-03	2.480E-06	7.912E-03	4.342E-05	7.955E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

$10^{0.5}$ atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
6.105E-01	6.610E-01	4.679E-01	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
1.505E 00	1.564E 00	1.104E 00	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
2.742E 00	2.825E 00	1.950E 00	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
5.205E 00	5.410E 00	3.556E 00	-1.053E-10	1.815E-06	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
7.238E 00	7.582E 00	4.861E 00	-8.774E-09	1.105E-04	7.405E 00	6.828E-01	6.828E-01	1.483E 00	4.603E-01
9.572E 00	1.011E 01	6.361E 00	-2.007E-07	2.016E-03	7.612E 00	6.816E-01	6.817E-01	1.522E 00	4.479E-01
1.221E 01	1.296E 01	8.056E 00	-2.161E-06	1.741E-02	7.830E 00	6.790E-01	6.798E-01	1.553E 00	4.376E-01
1.514E 01	1.610E 01	9.933E 00	-1.338E-05	9.123E-02	8.092E 00	6.740E-01	6.784E-01	1.574E 00	4.309E-01
1.837E 01	1.964E 01	1.202E 01	-5.879E-05	3.377E-01	8.507E 00	6.605E-01	6.761E-01	1.597E 00	4.235E-01
2.190E 01	2.348E 01	1.433E 01	-1.893E-04	9.707E-01	9.285E 00	6.331E-01	6.735E-01	1.610E 00	4.183E-01
2.570E 01	2.768E 01	1.683E 01	-5.175E-04	2.309E 00	1.074E 01	5.928E-01	6.714E-01	1.617E 00	4.153E-01
2.981E 01	3.216E 01	1.950E 01	-1.150E-03	4.741E 00	1.325E 01	5.487E-01	6.691E-01	1.614E 00	4.147E-01
3.420E 01	3.701E 01	2.238E 01	-2.267E-03	8.638E 00	1.716E 01	5.133E-01	6.671E-01	1.595E 00	4.182E-01
3.890E 01	4.214E 01	2.541E 01	-3.871E-03	1.426E 01	2.272E 01	4.922E-01	6.646E-01	1.558E 00	4.265E-01
4.385E 01	4.762E 01	2.864E 01	-5.912E-03	2.153E 01	2.984E 01	4.868E-01	6.621E-01	1.499E 00	4.417E-01
4.908E 01	5.343E 01	3.205E 01	-7.838E-03	2.990E 01	3.793E 01	4.943E-01	6.584E-01	1.421E 00	4.632E-01
5.464E 01	5.955E 01	3.566E 01	-9.607E-03	3.828E 01	4.594E 01	5.114E-01	6.529E-01	1.332E 00	4.902E-01
6.046E 01	6.598E 01	3.940E 01	-9.781E-03	4.434E 01	5.155E 01	5.344E-01	6.467E-01	1.244E 00	5.197E-01
6.656E 01	7.298E 01	4.330E 01	-8.893E-03	4.650E 01	5.323E 01	5.574E-01	6.405E-01	1.171E 00	5.471E-01
7.296E 01	7.997E 01	4.749E 01	-7.042E-03	4.360E 01	4.988E 01	5.805E-01	6.371E-01	1.111E 00	5.732E-01
7.962E 01	8.772E 01	5.184E 01	-5.263E-03	3.662E 01	4.252E 01	5.982E-01	6.377E-01	1.077E 00	5.923E-01
8.659E 01	9.537E 01	5.636E 01	-3.599E-03	2.801E 01	3.362E 01	6.148E-01	6.417E-01	1.053E 00	6.097E-01
9.386E 01	1.036E 02	6.102E 01	-2.461E-03	1.993E 01	2.533E 01	6.262E-01	6.469E-01	1.042E 00	6.208E-01
1.014E 02	1.121E 02	6.590E 01	-1.544E-03	1.362E 01	1.889E 01	6.351E-01	6.517E-01	1.036E 00	6.289E-01
1.092E 02	1.208E 02	7.103E 01	-9.903E-04	9.157E 00	1.433E 01	6.424E-01	6.557E-01	1.033E 00	6.350E-01
1.173E 02	1.302E 02	7.627E 01	-6.535E-04	6.126E 00	1.124E 01	6.468E-01	6.586E-01	1.033E 00	6.373E-01
1.257E 02	1.397E 02	8.162E 01	-4.360E-04	4.127E 00	9.196E 00	6.509E-01	6.608E-01	1.034E 00	6.391E-01
1.344E 02	1.497E 02	8.734E 01	-2.950E-04	2.813E 00	7.854E 00	6.539E-01	6.623E-01	1.036E 00	6.394E-01
1.434E 02	1.598E 02	9.300E 01	-2.021E-04	1.947E 00	6.969E 00	6.568E-01	6.634E-01	1.036E 00	6.404E-01
1.526E 02	1.703E 02	9.904E 01	-1.323E-04	1.369E 00	6.377E 00	6.590E-01	6.643E-01	1.037E 00	6.406E-01
1.621E 02	1.812E 02	1.053E 02	-9.148E-05	9.796E-01	5.977E 00	6.607E-01	6.648E-01	1.038E 00	6.402E-01
1.719E 02	1.927E 02	1.119E 02	-6.392E-05	7.165E-01	5.707E 00	6.619E-01	6.652E-01	1.041E 00	6.393E-01
1.820E 02	2.040E 02	1.185E 02	-4.494E-05	5.336E-01	5.519E 00	6.629E-01	6.655E-01	1.041E 00	6.393E-01
1.924E 02	2.164E 02	1.253E 02	-3.022E-05	4.073E-01	5.389E 00	6.635E-01	6.658E-01	1.044E 00	6.376E-01
2.030E 02	2.287E 02	1.327E 02	-2.271E-05	3.147E-01	5.294E 00	6.641E-01	6.659E-01	1.046E 00	6.369E-01
2.139E 02	2.421E 02	1.398E 02	-1.729E-05	2.466E-01	5.224E 00	6.645E-01	6.661E-01	1.050E 00	6.344E-01
2.253E 02	2.553E 02	1.474E 02	-1.133E-05	1.956E-01	5.171E 00	6.648E-01	6.662E-01	1.052E 00	6.332E-01
2.368E 02	2.698E 02	1.548E 02	-7.847E-06	1.578E-01	5.132E 00	6.651E-01	6.662E-01	1.057E 00	6.301E-01
2.485E 02	2.834E 02	1.626E 02	-5.318E-06	1.293E-01	5.102E 00	6.653E-01	6.663E-01	1.058E 00	6.300E-01
2.607E 02	2.982E 02	1.708E 02	-3.433E-06	1.075E-01	5.080E 00	6.655E-01	6.663E-01	1.061E 00	6.279E-01
2.730E 02	3.136E 02	1.792E 02	-1.989E-06	8.905E-02	5.061E 00	6.656E-01	6.664E-01	1.065E 00	6.256E-01
2.857E 02	3.295E 02	1.875E 02	-9.240E-07	7.496E-02	5.046E 00	6.657E-01	6.664E-01	1.069E 00	6.232E-01
2.987E 02	3.461E 02	1.960E 02	-4.533E-07	6.316E-02	5.034E 00	6.658E-01	6.664E-01	1.074E 00	6.205E-01
3.121E 02	3.632E 02	2.052E 02	-9.837E-08	5.375E-02	5.024E 00	6.659E-01	6.665E-01	1.079E 00	6.176E-01
3.255E 02	3.799E 02	2.139E 02	4.248E-07	4.572E-02	5.016E 00	6.660E-01	6.665E-01	1.082E 00	6.161E-01
3.395E 02	3.984E 02	2.232E 02	8.161E-07	3.917E-02	5.009E 00	6.660E-01	6.665E-01	1.088E 00	6.128E-01
3.536E 02	4.162E 02	2.328E 02	1.099E-06	4.033E-02	5.010E 00	6.660E-01	6.665E-01	1.091E 00	6.110E-01
3.681E 02	4.360E 02	2.427E 02	1.310E-06	2.906E-02	4.998E 00	6.661E-01	6.665E-01	1.098E 00	6.072E-01
3.828E 02	4.551E 02	2.528E 02	1.278E-06	2.476E-02	4.994E 00	6.662E-01	6.665E-01	1.102E 00	6.051E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(k) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	3.595E-10	7.190E-10	7.390E-04	3.083E-04	1.047E-03	2.128E-10	1.047E-03	1.999E-04
1200	3.122E-08	6.245E-08	8.353E-04	3.803E-04	1.216E-03	1.514E-08	1.216E-03	2.260E-04
1400	7.681E-07	1.536E-06	9.286E-04	4.625E-04	1.391E-03	3.154E-07	1.391E-03	2.512E-04
1600	8.591E-06	1.718E-05	1.018E-03	5.518E-04	1.570E-03	3.055E-06	1.573E-03	2.754E-04
1800	5.657E-05	1.131E-04	1.107E-03	6.450E-04	1.752E-03	1.768E-05	1.770E-03	2.994E-04
2000	2.569E-04	5.136E-04	1.194E-03	7.420E-04	1.936E-03	7.187E-05	2.008E-03	3.229E-04
2200	8.890E-04	1.776E-03	1.282E-03	8.417E-04	2.123E-03	2.247E-04	2.348E-03	3.463E-04
2400	2.510E-03	5.007E-03	1.374E-03	9.408E-04	2.314E-03	5.782E-04	2.893E-03	3.702E-04
2600	6.056E-03	1.204E-02	1.469E-03	1.037E-03	2.505E-03	1.277E-03	3.782E-03	3.936E-04
2800	1.290E-02	2.547E-02	1.578E-03	1.128E-03	2.707E-03	2.500E-03	5.206E-03	4.185E-04
3000	2.490E-02	4.859E-02	1.702E-03	1.209E-03	2.912E-03	4.432E-03	7.344E-03	4.433E-04
3200	4.427E-02	8.479E-02	1.856E-03	1.276E-03	3.132E-03	7.218E-03	1.035E-02	4.700E-04
3400	7.352E-02	1.370E-01	2.042E-03	1.322E-03	3.365E-03	1.090E-02	1.427E-02	4.975E-04
3600	1.159E-01	2.077E-01	2.266E-03	1.339E-03	3.605E-03	1.545E-02	1.905E-02	5.243E-04
3800	1.716E-01	2.930E-01	2.524E-03	1.322E-03	3.846E-03	2.025E-02	2.409E-02	5.500E-04
4000	2.436E-01	3.918E-01	2.809E-03	1.264E-03	4.074E-03	2.494E-02	2.902E-02	5.715E-04
4200	3.304E-01	4.966E-01	3.097E-03	1.167E-03	4.265E-03	2.840E-02	3.267E-02	5.860E-04
4400	4.278E-01	5.992E-01	3.377E-03	1.037E-03	4.414E-03	3.003E-02	3.445E-02	5.954E-04
4600	5.285E-01	6.915E-01	3.633E-03	8.848E-04	4.518E-03	2.913E-02	3.365E-02	6.013E-04
4800	6.262E-01	7.701E-01	3.862E-03	7.262E-04	4.589E-03	2.620E-02	3.079E-02	6.060E-04
5000	7.119E-01	8.317E-01	4.067E-03	5.794E-04	4.647E-03	2.200E-02	2.664E-02	6.124E-04
5200	7.821E-01	8.777E-01	4.253E-03	4.537E-04	4.707E-03	1.751E-02	2.222E-02	6.214E-04
5400	8.373E-01	9.114E-01	4.427E-03	3.518E-04	4.779E-03	1.348E-02	1.825E-02	6.329E-04
5600	8.788E-01	9.355E-01	4.592E-03	2.719E-04	4.864E-03	1.014E-02	1.500E-02	6.465E-04
5800	9.095E-01	9.526E-01	4.750E-03	2.110E-04	4.961E-03	7.553E-03	1.251E-02	6.616E-04
6000	9.319E-01	9.647E-01	4.907E-03	1.647E-04	5.071E-03	5.614E-03	1.068E-02	6.782E-04
6200	9.493E-01	9.740E-01	5.060E-03	1.271E-04	5.187E-03	4.198E-03	9.385E-03	6.954E-04
6400	9.615E-01	9.804E-01	5.212E-03	1.002E-04	5.312E-03	3.163E-03	8.476E-03	7.135E-04
6600	9.704E-01	9.850E-01	5.364E-03	8.005E-05	5.444E-03	2.422E-03	7.866E-03	7.322E-04
6800	9.769E-01	9.883E-01	5.513E-03	6.464E-05	5.577E-03	1.875E-03	7.453E-03	7.510E-04
7000	9.816E-01	9.907E-01	5.664E-03	5.321E-05	5.717E-03	1.487E-03	7.204E-03	7.704E-04
7200	9.853E-01	9.926E-01	5.812E-03	4.411E-05	5.856E-03	1.188E-03	7.044E-03	7.897E-04
7400	9.880E-01	9.940E-01	5.962E-03	3.725E-05	5.999E-03	9.629E-04	6.962E-03	8.094E-04
7600	9.902E-01	9.951E-01	6.111E-03	3.161E-05	6.143E-03	7.873E-04	6.930E-03	8.291E-04
7800	9.918E-01	9.959E-01	6.261E-03	2.721E-05	6.288E-03	6.559E-04	6.944E-03	8.490E-04
8000	9.931E-01	9.966E-01	6.410E-03	2.361E-05	6.434E-03	5.518E-04	6.985E-03	8.689E-04
8200	9.941E-01	9.971E-01	6.559E-03	2.082E-05	6.579E-03	4.714E-04	7.051E-03	8.887E-04
8400	9.950E-01	9.975E-01	6.708E-03	1.832E-05	6.726E-03	4.016E-04	7.128E-03	9.088E-04
8600	9.957E-01	9.978E-01	6.858E-03	1.637E-05	6.874E-03	3.474E-04	7.222E-03	9.289E-04
8800	9.963E-01	9.981E-01	7.008E-03	1.461E-05	7.022E-03	3.008E-04	7.323E-03	9.490E-04
9000	9.968E-01	9.984E-01	7.159E-03	1.313E-05	7.172E-03	2.629E-04	7.435E-03	9.693E-04
9200	9.972E-01	9.986E-01	7.307E-03	1.176E-05	7.318E-03	2.290E-04	7.547E-03	9.892E-04
9400	9.975E-01	9.988E-01	7.458E-03	1.064E-05	7.469E-03	2.014E-04	7.670E-03	1.010E-03
9600	9.978E-01	9.989E-01	7.608E-03	9.595E-06	7.618E-03	2.123E-04	7.830E-03	1.030E-03
9800	9.981E-01	9.990E-01	7.758E-03	8.771E-06	7.767E-03	1.570E-04	7.924E-03	1.050E-03
10000	9.983E-01	9.992E-01	7.909E-03	7.831E-06	7.917E-03	1.369E-04	8.054E-03	1.070E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^1 atmosphere.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E-01	2.090E-01	1.480E-01	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E-01	4.945E-01	3.490E-01	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E-01	8.933E-01	6.165E-01	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E 00	1.711E 00	1.124E 00	-5.920E-11	1.020E-06	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E 00	2.398E 00	1.537E 00	-4.934E-09	6.216E-05	7.404E 00	6.828E-01	6.828E-01	1.483E 00	4.603E-01
3.027E 00	3.196E 00	2.012E 00	-1.129E-07	1.134E-03	7.611E 00	6.816E-01	6.817E-01	1.522E 00	4.479E-01
3.860E 00	4.098E 00	2.547E 00	-1.215E-06	9.788E-03	7.822E 00	6.794E-01	6.798E-01	1.553E 00	4.376E-01
4.789E 00	5.092E 00	3.141E 00	-7.523E-06	5.130E-02	8.052E 00	6.759E-01	6.784E-01	1.574E 00	4.309E-01
5.810E 00	6.210E 00	3.801E 00	-3.308E-05	1.899E-01	8.361E 00	6.671E-01	6.762E-01	1.597E 00	4.234E-01
6.924E 00	7.426E 00	4.531E 00	-1.067E-04	5.462E-01	8.866E 00	6.491E-01	6.736E-01	1.612E 00	4.180E-01
8.128E 00	8.753E 00	5.321E 00	-2.928E-04	1.301E 00	9.745E 00	6.201E-01	6.716E-01	1.621E 00	4.142E-01
9.426E 00	1.017E 01	6.165E 00	-6.564E-04	2.679E 00	1.122E 01	5.826E-01	6.695E-01	1.624E 00	4.121E-01
1.081E 01	1.170E 01	7.077E 00	-1.316E-03	4.908E 00	1.350E 01	5.453E-01	6.677E-01	1.617E 00	4.128E-01
1.230E 01	1.333E 01	8.035E 00	-2.314E-03	8.187E 00	1.679E 01	5.152E-01	6.658E-01	1.599E 00	4.163E-01
1.387E 01	1.506E 01	9.055E 00	-3.706E-03	1.259E 01	2.113E 01	4.971E-01	6.641E-01	1.564E 00	4.246E-01
1.552E 01	1.690E 01	1.014E 01	-5.282E-03	1.801E 01	2.642E 01	4.904E-01	6.620E-01	1.513E 00	4.375E-01
1.728E 01	1.883E 01	1.128E 01	-7.180E-03	2.423E 01	3.241E 01	4.938E-01	6.588E-01	1.447E 00	4.552E-01
1.912E 01	2.086E 01	1.246E 01	-8.361E-03	3.026E 01	3.814E 01	5.061E-01	6.554E-01	1.372E 00	4.777E-01
2.105E 01	2.308E 01	1.369E 01	-8.980E-03	3.548E 01	4.299E 01	5.223E-01	6.504E-01	1.297E 00	5.014E-01
2.307E 01	2.529E 01	1.502E 01	-8.575E-03	3.871E 01	4.581E 01	5.424E-01	6.444E-01	1.223E 00	5.271E-01
2.518E 01	2.774E 01	1.639E 01	-7.757E-03	3.909E 01	4.578E 01	5.604E-01	6.393E-01	1.165E 00	5.488E-01
2.738E 01	3.016E 01	1.782E 01	-6.327E-03	3.646E 01	4.277E 01	5.795E-01	6.369E-01	1.116E 00	5.706E-01
2.968E 01	3.278E 01	1.930E 01	-5.032E-03	3.149E 01	3.747E 01	5.949E-01	6.371E-01	1.085E 00	5.875E-01
3.206E 01	3.546E 01	2.084E 01	-3.557E-03	2.545E 01	3.117E 01	6.083E-01	6.398E-01	1.063E 00	6.017E-01
3.454E 01	3.820E 01	2.246E 01	-2.490E-03	1.956E 01	2.508E 01	6.200E-01	6.439E-01	1.050E 00	6.135E-01
3.709E 01	4.117E 01	2.412E 01	-1.752E-03	1.450E 01	1.987E 01	6.280E-01	6.481E-01	1.044E 00	6.208E-01
3.974E 01	4.418E 01	2.581E 01	-1.223E-03	1.054E 01	1.581E 01	6.348E-01	6.519E-01	1.040E 00	6.266E-01
4.249E 01	4.734E 01	2.762E 01	-8.545E-04	7.594E 00	1.278E 01	6.399E-01	6.551E-01	1.040E 00	6.300E-01
4.535E 01	5.053E 01	2.941E 01	-5.990E-04	5.470E 00	1.060E 01	6.449E-01	6.577E-01	1.039E 00	6.333E-01
4.824E 01	5.385E 01	3.132E 01	-3.988E-04	3.966E 00	9.056E 00	6.488E-01	6.598E-01	1.039E 00	6.353E-01
5.125E 01	5.732E 01	3.331E 01	-2.790E-04	2.899E 00	7.959E 00	6.519E-01	6.613E-01	1.040E 00	6.361E-01
5.435E 01	6.093E 01	3.538E 01	-1.966E-04	2.153E 00	7.192E 00	6.544E-01	6.625E-01	1.041E 00	6.361E-01
5.755E 01	6.452E 01	3.747E 01	-1.391E-04	1.622E 00	6.646E 00	6.567E-01	6.633E-01	1.042E 00	6.369E-01
6.084E 01	6.843E 01	3.963E 01	-9.398E-05	1.248E 00	6.260E 00	6.581E-01	6.640E-01	1.045E 00	6.357E-01
6.418E 01	7.232E 01	4.196E 01	-7.086E-05	9.705E-01	5.974E 00	6.596E-01	6.645E-01	1.046E 00	6.353E-01
6.766E 01	7.655E 01	4.421E 01	-5.406E-05	7.638E-01	5.761E 00	6.605E-01	6.649E-01	1.050E 00	6.331E-01
7.124E 01	8.075E 01	4.663E 01	-3.551E-05	6.081E-01	5.600E 00	6.614E-01	6.652E-01	1.052E 00	6.321E-01
7.488E 01	8.533E 01	4.895E 01	-2.463E-05	4.920E-01	5.480E 00	6.620E-01	6.654E-01	1.057E 00	6.292E-01
7.860E 01	8.962E 01	5.143E 01	-1.671E-05	4.042E-01	5.389E 00	6.627E-01	6.656E-01	1.058E 00	6.293E-01
8.243E 01	9.430E 01	5.400E 01	-1.080E-05	3.364E-01	5.319E 00	6.632E-01	6.657E-01	1.061E 00	6.273E-01
8.634E 01	9.916E 01	5.666E 01	-6.262E-06	2.792E-01	5.259E 00	6.636E-01	6.658E-01	1.065E 00	6.251E-01
9.034E 01	1.042E 02	5.928E 01	-2.911E-06	2.353E-01	5.214E 00	6.639E-01	6.659E-01	1.069E 00	6.228E-01
9.445E 01	1.094E 02	6.199E 01	-1.429E-06	1.985E-01	5.176E 00	6.641E-01	6.660E-01	1.074E 00	6.201E-01
9.870E 01	1.149E 02	6.490E 01	-3.102E-07	1.690E-01	5.145E 00	6.644E-01	6.661E-01	1.079E 00	6.173E-01
1.029E 02	1.201E 02	6.763E 01	1.340E-06	1.439E-01	5.119E 00	6.646E-01	6.662E-01	1.082E 00	6.158E-01
1.073E 02	1.260E 02	7.058E 01	2.575E-06	1.233E-01	5.097E 00	6.648E-01	6.662E-01	1.088E 00	6.125E-01
1.118E 02	1.316E 02	7.361E 01	3.469E-06	1.271E-01	5.100E 00	6.648E-01	6.663E-01	1.091E 00	6.108E-01
1.164E 02	1.379E 02	7.674E 01	4.137E-06	9.159E-02	5.064E 00	6.651E-01	6.663E-01	1.098E 00	6.070E-01
1.210E 02	1.439E 02	7.995E 01	4.037E-06	7.806E-02	5.050E 00	6.653E-01	6.663E-01	1.102E 00	6.049E-01

TABLE III. - Continued. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(l) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	2.022E-10	4.043E-10	7.390E-04	3.083E-04	1.047E-03	1.196E-10	1.047E-03	1.999E-04
1200	1.756E-08	3.512E-08	8.353E-04	3.803E-04	1.216E-03	8.511E-09	1.216E-03	2.260E-04
1400	4.319E-07	8.639E-07	9.286E-04	4.625E-04	1.391E-03	1.774E-07	1.391E-03	2.512E-04
1600	4.831E-06	9.662E-06	1.018E-03	5.518E-04	1.570E-03	1.718E-06	1.571E-03	2.754E-04
1800	3.181E-05	6.362E-05	1.107E-03	6.450E-04	1.752E-03	9.945E-06	1.762E-03	2.994E-04
2000	1.444E-04	2.888E-04	1.194E-03	7.421E-04	1.936E-03	4.042E-05	1.976E-03	3.229E-04
2200	4.999E-04	9.993E-04	1.281E-03	8.421E-04	2.123E-03	1.264E-04	2.249E-03	3.462E-04
2400	1.411E-03	2.819E-03	1.371E-03	9.421E-04	2.313E-03	3.255E-04	2.638E-03	3.700E-04
2600	3.406E-03	6.788E-03	1.461E-03	1.040E-03	2.501E-03	7.199E-04	3.221E-03	3.933E-04
2800	7.254E-03	1.440E-02	1.561E-03	1.136E-03	2.698E-03	1.414E-03	4.112E-03	4.176E-04
3000	1.401E-02	2.763E-02	1.669E-03	1.225E-03	2.894E-03	2.521E-03	5.415E-03	4.417E-04
3200	2.491E-02	4.862E-02	1.795E-03	1.307E-03	3.102E-03	4.144E-03	7.246E-03	4.674E-04
3400	4.142E-02	7.955E-02	1.943E-03	1.377E-03	3.320E-03	6.356E-03	9.676E-03	4.938E-04
3600	6.546E-02	1.229E-01	2.116E-03	1.430E-03	3.546E-03	9.223E-03	1.277E-02	5.206E-04
3800	9.750E-02	1.777E-01	2.321E-03	1.460E-03	3.781E-03	1.253E-02	1.631E-02	5.484E-04
4000	1.399E-01	2.454E-01	2.557E-03	1.465E-03	4.022E-03	1.628E-02	2.031E-02	5.755E-04
4200	1.931E-01	3.237E-01	2.812E-03	1.441E-03	4.253E-03	2.000E-02	2.426E-02	5.990E-04
4400	2.572E-01	4.092E-01	3.085E-03	1.387E-03	4.471E-03	2.344E-02	2.791E-02	6.195E-04
4600	3.304E-01	4.967E-01	3.360E-03	1.299E-03	4.659E-03	2.586E-02	3.052E-02	6.353E-04
4800	4.116E-01	5.832E-01	3.626E-03	1.184E-03	4.810E-03	2.711E-02	3.192E-02	6.461E-04
5000	4.952E-01	6.624E-01	3.876E-03	1.051E-03	4.927E-03	2.681E-02	3.174E-02	6.540E-04
5200	5.766E-01	7.314E-01	4.105E-03	9.104E-04	5.016E-03	2.509E-02	3.010E-02	6.609E-04
5400	6.525E-01	7.897E-01	4.317E-03	7.727E-04	5.089E-03	2.243E-02	2.752E-02	6.681E-04
5600	7.194E-01	8.368E-01	4.511E-03	6.447E-04	5.156E-03	1.921E-02	2.437E-02	6.767E-04
5800	7.760E-01	8.739E-01	4.691E-03	5.325E-04	5.223E-03	1.595E-02	2.118E-02	6.868E-04
6000	8.222E-01	9.024E-01	4.863E-03	4.367E-04	5.299E-03	1.293E-02	1.823E-02	6.990E-04
6200	8.618E-01	9.257E-01	5.028E-03	3.511E-04	5.379E-03	1.040E-02	1.578E-02	7.120E-04
6400	8.915E-01	9.427E-01	5.188E-03	2.852E-04	5.473E-03	8.269E-03	1.374E-02	7.270E-04
6600	9.144E-01	9.553E-01	5.345E-03	2.332E-04	5.578E-03	6.595E-03	1.217E-02	7.431E-04
6800	9.319E-01	9.648E-01	5.499E-03	1.916E-04	5.690E-03	5.268E-03	1.096E-02	7.600E-04
7000	9.452E-01	9.718E-01	5.652E-03	1.597E-04	5.812E-03	4.276E-03	1.009E-02	7.778E-04
7200	9.556E-01	9.773E-01	5.803E-03	1.338E-04	5.937E-03	3.479E-03	9.416E-03	7.958E-04
7400	9.635E-01	9.814E-01	5.954E-03	1.138E-04	6.068E-03	2.859E-03	8.928E-03	8.146E-04
7600	9.699E-01	9.847E-01	6.105E-03	9.714E-05	6.202E-03	2.364E-03	8.566E-03	8.335E-04
7800	9.748E-01	9.873E-01	6.256E-03	8.403E-05	6.341E-03	1.986E-03	8.327E-03	8.528E-04
8000	9.787E-01	9.893E-01	6.406E-03	7.319E-05	6.479E-03	1.682E-03	8.161E-03	8.721E-04
8200	9.818E-01	9.908E-01	6.555E-03	6.473E-05	6.620E-03	1.445E-03	8.065E-03	8.916E-04
8400	9.845E-01	9.922E-01	6.705E-03	5.708E-05	6.762E-03	1.237E-03	7.999E-03	9.113E-04
8600	9.865E-01	9.932E-01	6.856E-03	5.111E-05	6.907E-03	1.074E-03	7.980E-03	9.311E-04
8800	9.883E-01	9.941E-01	7.006E-03	4.568E-05	7.051E-03	9.323E-04	7.984E-03	9.510E-04
9000	9.898E-01	9.949E-01	7.157E-03	4.112E-05	7.198E-03	8.170E-04	8.015E-03	9.711E-04
9200	9.911E-01	9.956E-01	7.305E-03	3.688E-05	7.342E-03	7.132E-04	8.055E-03	9.908E-04
9400	9.922E-01	9.961E-01	7.457E-03	3.341E-05	7.490E-03	6.285E-04	8.119E-03	1.011E-03
9600	9.932E-01	9.966E-01	7.607E-03	3.015E-05	7.637E-03	6.635E-04	8.301E-03	1.031E-03
9800	9.940E-01	9.970E-01	7.757E-03	2.758E-05	7.785E-03	4.915E-04	8.277E-03	1.051E-03
10000	9.948E-01	9.974E-01	7.908E-03	2.464E-05	7.933E-03	4.291E-04	8.362E-03	1.071E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

$10^{1.5}$ atmospheres.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
6.105E-02	6.610E-02	4.679E-02	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
1.505E-01	1.564E-01	1.104E-01	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
2.742E-01	2.825E-01	1.950E-01	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
5.205E-01	5.410E-01	3.556E-01	-3.329E-11	5.739E-07	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
7.238E-01	7.582E-01	4.861E-01	-2.775E-09	3.496E-05	7.404E 00	6.828E-01	6.828E-01	1.483E 00	4.603E-01
9.572E-01	1.011E 00	6.361E-01	-6.347E-08	6.375E-04	7.610E 00	6.816E-01	6.817E-01	1.522E 00	4.479E-01
1.221E 00	1.296E 00	8.056E-01	-6.833E-07	5.504E-03	7.818E 00	6.796E-01	6.798E-01	1.553E 00	4.376E-01
1.514E 00	1.610E 00	9.933E-01	-4.231E-06	2.885E-02	8.030E 00	6.770E-01	6.784E-01	1.574E 00	4.309E-01
1.837E 00	1.964E 00	1.202E 00	-1.861E-05	1.068E-01	8.278E 00	6.710E-01	6.762E-01	1.597E 00	4.233E-01
2.190E 00	2.348E 00	1.433E 00	-6.007E-05	3.073E-01	8.629E 00	6.592E-01	6.736E-01	1.612E 00	4.177E-01
2.570E 00	2.768E 00	1.683E 00	-1.652E-04	7.324E-01	9.184E 00	6.398E-01	6.717E-01	1.624E 00	4.136E-01
2.981E 00	3.216E 00	1.950E 00	-3.722E-04	1.510E 00	1.007E 01	6.118E-01	6.696E-01	1.631E 00	4.106E-01
3.420E 00	3.701E 00	2.238E 00	-7.530E-04	2.776E 00	1.141E 01	5.792E-01	6.680E-01	1.631E 00	4.097E-01
3.890E 00	4.214E 00	2.541E 00	-1.346E-03	4.656E 00	1.334E 01	5.472E-01	6.664E-01	1.624E 00	4.104E-01
4.385E 00	4.762E 00	2.864E 00	-2.216E-03	7.226E 00	1.591E 01	5.217E-01	6.652E-01	1.605E 00	4.143E-01
4.908E 00	5.343E 00	3.205E 00	-3.288E-03	1.050E 01	1.913E 01	5.045E-01	6.637E-01	1.576E 00	4.213E-01
5.464E 00	5.955E 00	3.566E 00	-4.744E-03	1.447E 01	2.300E 01	4.955E-01	6.617E-01	1.533E 00	4.316E-01
6.046E 00	6.598E 00	3.940E 00	-5.978E-03	1.873E 01	2.709E 01	4.958E-01	6.602E-01	1.480E 00	4.462E-01
6.656E 00	7.298E 00	4.330E 00	-7.122E-03	2.316E 01	3.129E 01	5.014E-01	6.578E-01	1.421E 00	4.628E-01
7.296E 00	7.997E 00	4.749E 00	-7.718E-03	2.727E 01	3.511E 01	5.131E-01	6.536E-01	1.353E 00	4.832E-01
7.962E 00	8.772E 00	5.184E 00	-8.079E-03	3.051E 01	3.802E 01	5.263E-01	6.490E-01	1.291E 00	5.028E-01
8.659E 00	9.537E 00	5.636E 00	-7.711E-03	3.237E 01	3.953E 01	5.430E-01	6.444E-01	1.228E 00	5.247E-01
9.386E 00	1.036E 01	6.102E 00	-7.203E-03	3.258E 01	3.938E 01	5.582E-01	6.400E-01	1.177E 00	5.437E-01
1.014E 01	1.121E 01	6.590E 00	-5.920E-03	3.102E 01	3.749E 01	5.730E-01	6.371E-01	1.135E 00	5.612E-01
1.092E 01	1.208E 01	7.103E 00	-4.732E-03	2.802E 01	3.420E 01	5.871E-01	6.364E-01	1.102E 00	5.773E-01
1.173E 01	1.302E 01	7.627E 00	-3.725E-03	2.414E 01	3.006E 01	5.984E-01	6.374E-01	1.081E 00	5.895E-01
1.257E 01	1.397E 01	8.162E 00	-2.848E-03	1.998E 01	2.570E 01	6.087E-01	6.399E-01	1.066E 00	6.003E-01
1.344E 01	1.497E 01	8.734E 00	-2.135E-03	1.604E 01	2.159E 01	6.169E-01	6.431E-01	1.057E 00	6.083E-01
1.434E 01	1.598E 01	9.300E 00	-1.580E-03	1.260E 01	1.802E 01	6.246E-01	6.465E-01	1.050E 00	6.156E-01
1.526E 01	1.703E 01	9.904E 00	-1.099E-03	9.824E 00	1.514E 01	6.311E-01	6.500E-01	1.046E 00	6.212E-01
1.621E 01	1.812E 01	1.053E 01	-7.937E-04	7.577E 00	1.282E 01	6.361E-01	6.530E-01	1.045E 00	6.250E-01
1.719E 01	1.927E 01	1.119E 01	-5.727E-04	5.863E 00	1.104E 01	6.402E-01	6.555E-01	1.045E 00	6.273E-01
1.820E 01	2.040E 01	1.185E 01	-4.123E-04	4.556E 00	9.693E 00	6.442E-01	6.575E-01	1.044E 00	6.298E-01
1.924E 01	2.164E 01	1.253E 01	-2.822E-04	3.589E 00	8.693E 00	6.467E-01	6.591E-01	1.046E 00	6.299E-01
2.030E 01	2.287E 01	1.327E 01	-2.150E-04	2.842E 00	7.921E 00	6.494E-01	6.604E-01	1.047E 00	6.307E-01
2.139E 01	2.421E 01	1.398E 01	-1.653E-04	2.268E 00	7.327E 00	6.511E-01	6.614E-01	1.051E 00	6.293E-01
2.253E 01	2.553E 01	1.474E 01	-1.092E-04	1.826E 00	6.869E 00	6.531E-01	6.623E-01	1.053E 00	6.290E-01
2.368E 01	2.698E 01	1.548E 01	-7.610E-05	1.490E 00	6.521E 00	6.543E-01	6.629E-01	1.058E 00	6.266E-01
2.485E 01	2.834E 01	1.626E 01	-5.183E-05	1.232E 00	6.254E 00	6.560E-01	6.635E-01	1.058E 00	6.271E-01
2.607E 01	2.982E 01	1.708E 01	-3.358E-05	1.031E 00	6.045E 00	6.570E-01	6.639E-01	1.061E 00	6.254E-01
2.730E 01	3.136E 01	1.792E 01	-1.953E-05	8.597E-01	5.867E 00	6.580E-01	6.642E-01	1.065E 00	6.236E-01
2.857E 01	3.295E 01	1.875E 01	-9.092E-06	7.271E-01	5.729E 00	6.587E-01	6.645E-01	1.069E 00	6.214E-01
2.987E 01	3.461E 01	1.960E 01	-4.471E-06	6.152E-01	5.613E 00	6.594E-01	6.648E-01	1.074E 00	6.189E-01
3.121E 01	3.632E 01	2.052E 01	-9.719E-07	5.253E-01	5.519E 00	6.600E-01	6.650E-01	1.079E 00	6.163E-01
3.255E 01	3.799E 01	2.139E 01	4.204E-06	4.482E-01	5.439E 00	6.607E-01	6.652E-01	1.082E 00	6.149E-01
3.395E 01	3.984E 01	2.232E 01	8.086E-06	3.849E-01	5.373E 00	6.612E-01	6.653E-01	1.088E 00	6.118E-01
3.536E 01	4.162E 01	2.328E 01	1.090E-05	3.971E-01	5.383E 00	6.611E-01	6.655E-01	1.091E 00	6.102E-01
3.681E 01	4.360E 01	2.427E 01	1.301E-05	2.867E-01	5.270E 00	6.621E-01	6.656E-01	1.098E 00	6.064E-01
3.828E 01	4.551E 01	2.528E 01	1.271E-05	2.447E-01	5.226E 00	6.626E-01	6.657E-01	1.101E 00	6.044E-01

TABLE III. - Concluded. TRANSPORT

[E-01, E-02, E-03, etc. denote exponents 10^{-1}, 10^{-2}, 10^{-3}, etc., respectively;

(m) Pressure,

Temperature, T, °K	Degree of dissociation, β	Mole fraction, x_H	Thermal conductivity, cal/(cm)(sec)(°K)					Viscosity, η, g/(cm)(sec)
			Due to translational degrees of freedom, λ_{tr}	Due to internal degrees of freedom, λ_{int}	Frozen, λ_f	Due to chemical reaction, λ_R	Total, λ	
300	0.000E-00	0.000E-00	3.306E-04	1.158E-04	4.464E-04	0.000E-00	4.464E-04	8.943E-05
500	0.000E-00	0.000E-00	4.641E-04	1.722E-04	6.363E-04	0.000E-00	6.363E-04	1.256E-04
700	0.000E-00	0.000E-00	5.814E-04	2.218E-04	8.032E-04	0.000E-00	8.032E-04	1.573E-04
1000	1.137E-10	2.274E-10	7.390E-04	3.083E-04	1.047E-03	6.728E-11	1.047E-03	1.999E-04
1200	9.874E-09	1.975E-08	8.353E-04	3.803E-04	1.216E-03	4.786E-09	1.216E-03	2.260E-04
1400	2.429E-07	4.858E-07	9.286E-04	4.625E-04	1.391E-03	9.974E-08	1.391E-03	2.512E-04
1600	2.717E-06	5.433E-06	1.018E-03	5.518E-04	1.570E-03	9.661E-07	1.571E-03	2.754E-04
1800	1.789E-05	3.578E-05	1.107E-03	6.450E-04	1.752E-03	5.593E-06	1.757E-03	2.994E-04
2000	8.122E-05	1.624E-04	1.194E-03	7.421E-04	1.936E-03	2.273E-05	1.958E-03	3.229E-04
2200	2.811E-04	5.621E-04	1.280E-03	8.423E-04	2.123E-03	7.110E-05	2.194E-03	3.462E-04
2400	7.937E-04	1.586E-03	1.369E-03	9.428E-04	2.312E-03	1.832E-04	2.495E-03	3.700E-04
2600	1.915E-03	3.823E-03	1.457E-03	1.042E-03	2.499E-03	4.055E-04	2.905E-03	3.931E-04
2800	4.079E-03	8.126E-03	1.552E-03	1.141E-03	2.693E-03	7.976E-04	3.490E-03	4.172E-04
3000	7.877E-03	1.563E-02	1.649E-03	1.235E-03	2.884E-03	1.426E-03	4.310E-03	4.407E-04
3200	1.401E-02	2.764E-02	1.759E-03	1.324E-03	3.084E-03	2.357E-03	5.441E-03	4.656E-04
3400	2.331E-02	4.555E-02	1.882E-03	1.408E-03	3.290E-03	3.644E-03	6.934E-03	4.911E-04
3600	3.686E-02	7.111E-02	2.021E-03	1.482E-03	3.502E-03	5.353E-03	8.856E-03	5.168E-04
3800	5.501E-02	1.043E-01	2.182E-03	1.542E-03	3.724E-03	7.403E-03	1.113E-02	5.441E-04
4000	7.919E-02	1.468E-01	2.368E-03	1.586E-03	3.954E-03	9.870E-03	1.382E-02	5.719E-04
4200	1.100E-01	1.982E-01	2.572E-03	1.614E-03	4.186E-03	1.257E-02	1.676E-02	5.983E-04
4400	1.480E-01	2.579E-01	2.803E-03	1.621E-03	4.424E-03	1.547E-02	1.990E-02	6.249E-04
4600	1.931E-01	3.238E-01	3.050E-03	1.603E-03	4.653E-03	1.822E-02	2.287E-02	6.494E-04
4800	2.462E-01	3.951E-01	3.308E-03	1.559E-03	4.867E-03	2.077E-02	2.564E-02	6.704E-04
5000	3.052E-01	4.677E-01	3.568E-03	1.492E-03	5.060E-03	2.274E-02	2.780E-02	6.876E-04
5200	3.689E-01	5.389E-01	3.824E-03	1.404E-03	5.227E-03	2.392E-02	2.915E-02	7.018E-04
5400	4.358E-01	6.071E-01	4.072E-03	1.298E-03	5.370E-03	2.432E-02	2.969E-02	7.132E-04
5600	5.033E-01	6.696E-01	4.307E-03	1.179E-03	5.487E-03	2.380E-02	2.928E-02	7.227E-04
5800	5.690E-01	7.253E-01	4.525E-03	1.057E-03	5.582E-03	2.251E-02	2.809E-02	7.311E-04
6000	6.305E-01	7.734E-01	4.731E-03	9.334E-04	5.664E-03	2.060E-02	2.627E-02	7.400E-04
6200	6.907E-01	8.171E-01	4.926E-03	8.053E-04	5.731E-03	1.865E-02	2.438E-02	7.483E-04
6400	7.420E-01	8.519E-01	5.109E-03	6.930E-04	5.802E-03	1.637E-02	2.217E-02	7.586E-04
6600	7.856E-01	8.800E-01	5.284E-03	5.943E-04	5.878E-03	1.418E-02	2.006E-02	7.704E-04
6800	8.223E-01	9.025E-01	5.451E-03	5.078E-04	5.959E-03	1.213E-02	1.809E-02	7.834E-04
7000	8.521E-01	9.201E-01	5.614E-03	4.367E-04	6.051E-03	1.040E-02	1.645E-02	7.978E-04
7200	8.768E-01	9.344E-01	5.772E-03	3.752E-04	6.147E-03	8.855E-03	1.500E-02	8.129E-04
7400	8.966E-01	9.455E-01	5.930E-03	3.255E-04	6.255E-03	7.543E-03	1.380E-02	8.293E-04
7600	9.131E-01	9.546E-01	6.086E-03	2.825E-04	6.368E-03	6.422E-03	1.279E-02	8.463E-04
7800	9.264E-01	9.618E-01	6.240E-03	2.475E-04	6.488E-03	5.526E-03	1.201E-02	8.640E-04
8000	9.370E-01	9.675E-01	6.392E-03	2.179E-04	6.610E-03	4.769E-03	1.138E-02	8.819E-04
8200	9.456E-01	9.720E-01	6.544E-03	1.943E-04	6.738E-03	4.158E-03	1.090E-02	9.003E-04
8400	9.532E-01	9.760E-01	6.696E-03	1.726E-04	6.869E-03	3.607E-03	1.048E-02	9.190E-04
8600	9.592E-01	9.792E-01	6.848E-03	1.554E-04	7.003E-03	3.164E-03	1.017E-02	9.380E-04
8800	9.645E-01	9.819E-01	6.999E-03	1.396E-04	7.139E-03	2.773E-03	9.912E-03	9.571E-04
9000	9.689E-01	9.842E-01	7.151E-03	1.262E-04	7.278E-03	2.449E-03	9.726E-03	9.766E-04
9200	9.728E-01	9.862E-01	7.301E-03	1.136E-04	7.414E-03	2.152E-03	9.567E-03	9.958E-04
9400	9.760E-01	9.879E-01	7.453E-03	1.033E-04	7.556E-03	1.907E-03	9.464E-03	1.016E-03
9600	9.789E-01	9.894E-01	7.604E-03	9.342E-05	7.698E-03	2.024E-03	9.721E-03	1.035E-03
9800	9.813E-01	9.906E-01	7.755E-03	8.565E-05	7.841E-03	1.505E-03	9.346E-03	1.055E-03
10000	9.837E-01	9.918E-01	7.906E-03	7.670E-05	7.983E-03	1.320E-03	9.303E-03	1.075E-03

PROPERTIES OF GASEOUS HYDROGEN

E 01, E 02, E 03, etc. denote exponents 10^1, 10^2, 10^3, etc., respectively.]

10^2 atmospheres.

Diffusion coefficient, D, cm^2/sec			Thermal-diffusion ratio, k_T	Molar heat capacity, cal/(mole)(°K)		Prandtl number		Lewis number, Le	Frozen Schmidt number, Sc_f
D_{H-H}	D_{H-H_2}	$D_{H_2-H_2}$		Due to chemical reaction, $C_{p,R}$	Equilibrium, $C_{p,e}$	Equilibrium, Pr_e	Frozen, Pr_f		
1.931E-02	2.090E-02	1.480E-02	-0.000E-00	0.000E-00	6.895E 00	6.852E-01	6.852E-01	1.312E 00	5.225E-01
4.760E-02	4.945E-02	3.490E-02	-0.000E-00	0.000E-00	6.993E 00	6.845E-01	6.845E-01	1.325E 00	5.167E-01
8.671E-02	8.933E-02	6.165E-02	-0.000E-00	0.000E-00	7.035E 00	6.834E-01	6.834E-01	1.362E 00	5.017E-01
1.646E-01	1.711E-01	1.124E-01	-1.872E-11	3.227E-07	7.218E 00	6.835E-01	6.835E-01	1.437E 00	4.756E-01
2.289E-01	2.398E-01	1.537E-01	-1.560E-09	1.966E-05	7.404E 00	6.828E-01	6.828E-01	1.483E 00	4.603E-01
3.027E-01	3.196E-01	2.012E-01	-3.569E-08	3.585E-04	7.610E 00	6.817E-01	6.817E-01	1.522E 00	4.479E-01
3.860E-01	4.098E-01	2.547E-01	-3.843E-07	3.095E-03	7.815E 00	6.797E-01	6.798E-01	1.553E 00	4.376E-01
4.789E-01	5.092E-01	3.141E-01	-2.379E-06	1.622E-02	8.018E 00	6.776E-01	6.784E-01	1.574E 00	4.309E-01
5.810E-01	6.210E-01	3.801E-01	-1.047E-05	6.007E-02	8.232E 00	6.732E-01	6.762E-01	1.597E 00	4.233E-01
6.924E-01	7.426E-01	4.531E-01	-3.380E-05	1.728E-01	8.496E 00	6.653E-01	6.736E-01	1.613E 00	4.176E-01
8.128E-01	8.753E-01	5.321E-01	-9.309E-05	4.121E-01	8.868E 00	6.527E-01	6.717E-01	1.625E 00	4.132E-01
9.426E-01	1.017E 00	6.165E-01	-2.103E-04	8.506E-01	9.419E 00	6.335E-01	6.697E-01	1.634E 00	4.098E-01
1.081E 00	1.170E 00	7.077E-01	-4.277E-04	1.566E 00	1.023E 01	6.087E-01	6.682E-01	1.638E 00	4.079E-01
1.230E 00	1.333E 00	8.035E-01	-7.719E-04	2.635E 00	1.136E 01	5.808E-01	6.667E-01	1.638E 00	4.070E-01
1.387E 00	1.506E 00	9.055E-01	-1.289E-03	4.110E 00	1.288E 01	5.542E-01	6.657E-01	1.630E 00	4.084E-01
1.552E 00	1.690E 00	1.014E 00	-1.958E-03	6.018E 00	1.479E 01	5.317E-01	6.647E-01	1.615E 00	4.117E-01
1.728E 00	1.883E 00	1.128E 00	-2.921E-03	8.397E 00	1.714E 01	5.143E-01	6.632E-01	1.591E 00	4.169E-01
1.912E 00	2.086E 00	1.246E 00	-3.850E-03	1.106E 01	1.973E 01	5.049E-01	6.625E-01	1.557E 00	4.255E-01
2.105E 00	2.308E 00	1.369E 00	-4.870E-03	1.404E 01	2.258E 01	5.001E-01	6.615E-01	1.519E 00	4.355E-01
2.307E 00	2.529E 00	1.502E 00	-5.695E-03	1.713E 01	2.551E 01	5.014E-01	6.590E-01	1.468E 00	4.490E-01
2.518E 00	2.774E 00	1.639E 00	-6.537E-03	2.014E 01	2.830E 01	5.062E-01	6.565E-01	1.417E 00	4.632E-01
2.738E 00	3.016E 00	1.782E 00	-6.947E-03	2.280E 01	3.072E 01	5.161E-01	6.537E-01	1.359E 00	4.810E-01
2.968E 00	3.278E 00	1.930E 00	-7.328E-03	2.496E 01	3.260E 01	5.269E-01	6.500E-01	1.305E 00	4.980E-01
3.206E 00	3.546E 00	2.084E 00	-6.855E-03	2.631E 01	3.365E 01	5.389E-01	6.457E-01	1.254E 00	5.151E-01
3.454E 00	3.820E 00	2.246E 00	-6.244E-03	2.672E 01	3.376E 01	5.519E-01	6.419E-01	1.206E 00	5.322E-01
3.709E 00	4.117E 00	2.412E 00	-5.586E-03	2.618E 01	3.293E 01	5.634E-01	6.388E-01	1.168E 00	5.468E-01
3.974E 00	4.418E 00	2.581E 00	-4.813E-03	2.475E 01	3.123E 01	5.748E-01	6.368E-01	1.136E 00	5.605E-01
4.249E 00	4.734E 00	2.762E 00	-4.016E-03	2.263E 01	2.887E 01	5.847E-01	6.359E-01	1.112E 00	5.720E-01
4.535E 00	5.053E 00	2.941E 00	-3.261E-03	2.008E 01	2.610E 01	5.947E-01	6.366E-01	1.092E 00	5.832E-01
4.824E 00	5.385E 00	3.132E 00	-2.466E-03	1.762E 01	2.344E 01	6.036E-01	6.383E-01	1.076E 00	5.929E-01
5.125E 00	5.732E 00	3.331E 00	-1.903E-03	1.500E 01	2.067E 01	6.111E-01	6.406E-01	1.067E 00	6.006E-01
5.435E 00	6.093E 00	3.538E 00	-1.448E-03	1.261E 01	1.815E 01	6.174E-01	6.433E-01	1.061E 00	6.066E-01
5.755E 00	6.452E 00	3.747E 00	-1.088E-03	1.049E 01	1.593E 01	6.235E-01	6.462E-01	1.055E 00	6.124E-01
6.084E 00	6.843E 00	3.963E 00	-7.701E-04	8.732E 00	1.409E 01	6.275E-01	6.487E-01	1.054E 00	6.152E-01
6.418E 00	7.232E 00	4.196E 00	-6.024E-04	7.235E 00	1.252E 01	6.317E-01	6.511E-01	1.053E 00	6.183E-01
6.766E 00	7.655E 00	4.421E 00	-4.728E-04	5.984E 00	1.122E 01	6.344E-01	6.531E-01	1.055E 00	6.189E-01
7.124E 00	8.075E 00	4.663E 00	-3.178E-04	4.960E 00	1.015E 01	6.375E-01	6.549E-01	1.056E 00	6.203E-01
7.488E 00	8.533E 00	4.895E 00	-2.245E-04	4.145E 00	9.303E 00	6.393E-01	6.564E-01	1.060E 00	6.192E-01
7.860E 00	8.962E 00	5.143E 00	-1.545E-04	3.494E 00	8.625E 00	6.422E-01	6.577E-01	1.060E 00	6.207E-01
8.243E 00	9.430E 00	5.400E 00	-1.009E-04	2.967E 00	8.076E 00	6.440E-01	6.588E-01	1.063E 00	6.200E-01
8.634E 00	9.916E 00	5.666E 00	-5.912E-05	2.507E 00	7.597E 00	6.457E-01	6.597E-01	1.066E 00	6.189E-01
9.034E 00	1.042E 01	5.928E 00	-2.769E-05	2.143E 00	7.217E 00	6.471E-01	6.605E-01	1.070E 00	6.174E-01
9.445E 00	1.094E 01	6.199E 00	-1.368E-05	1.830E 00	6.891E 00	6.484E-01	6.612E-01	1.074E 00	6.154E-01
9.870E 00	1.149E 01	6.490E 00	-2.987E-06	1.574E 00	6.624E 00	6.496E-01	6.618E-01	1.079E 00	6.132E-01
1.029E 01	1.201E 01	6.763E 00	1.297E-05	1.352E 00	6.392E 00	6.511E-01	6.623E-01	1.082E 00	6.123E-01
1.073E 01	1.260E 01	7.058E 00	2.502E-05	1.168E 00	6.199E 00	6.520E-01	6.628E-01	1.087E 00	6.095E-01
1.118E 01	1.316E 01	7.361E 00	3.384E-05	1.211E 00	6.235E 00	6.517E-01	6.632E-01	1.090E 00	6.082E-01
1.164E 01	1.379E 01	7.674E 00	4.046E-05	8.779E-01	5.896E 00	6.540E-01	6.635E-01	1.097E 00	6.047E-01
1.210E 01	1.439E 01	7.995E 00	3.960E-05	7.524E-01	5.764E 00	6.552E-01	6.639E-01	1.101E 00	6.029E-01

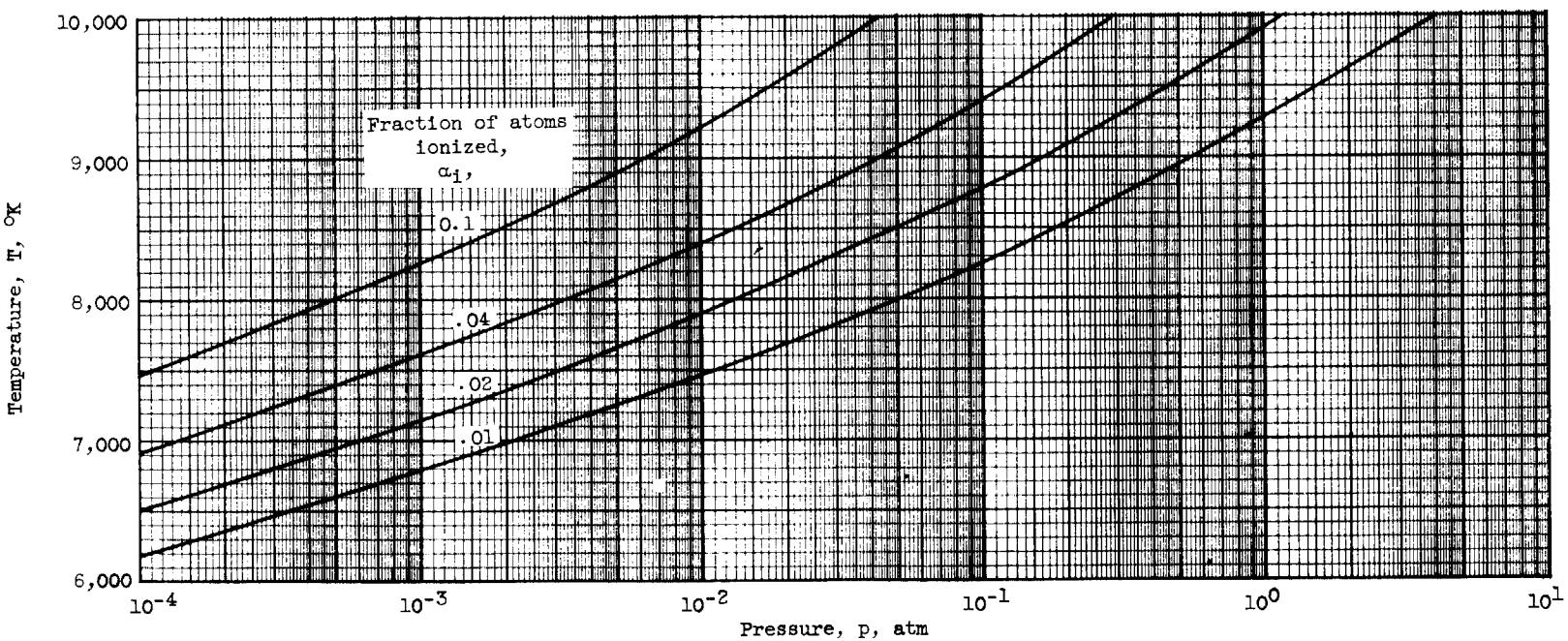


Figure 1. - Temperature and pressure for constant percentage of ionized atoms.

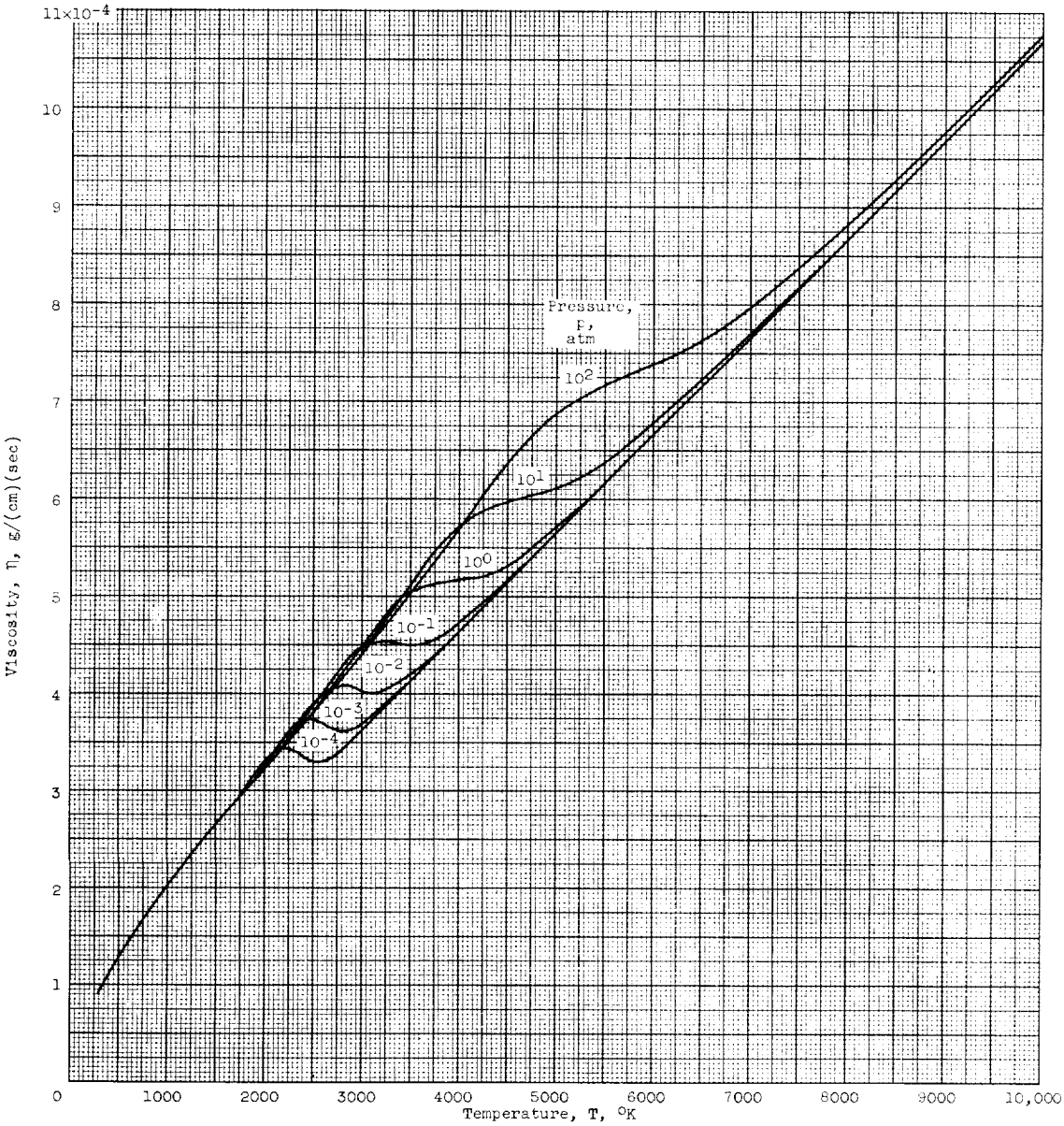


Figure 2. - Viscosity of gaseous hydrogen for temperatures from 300° to 10,000° K and pressures from 10^{-4} to 10^{2} atmospheres.

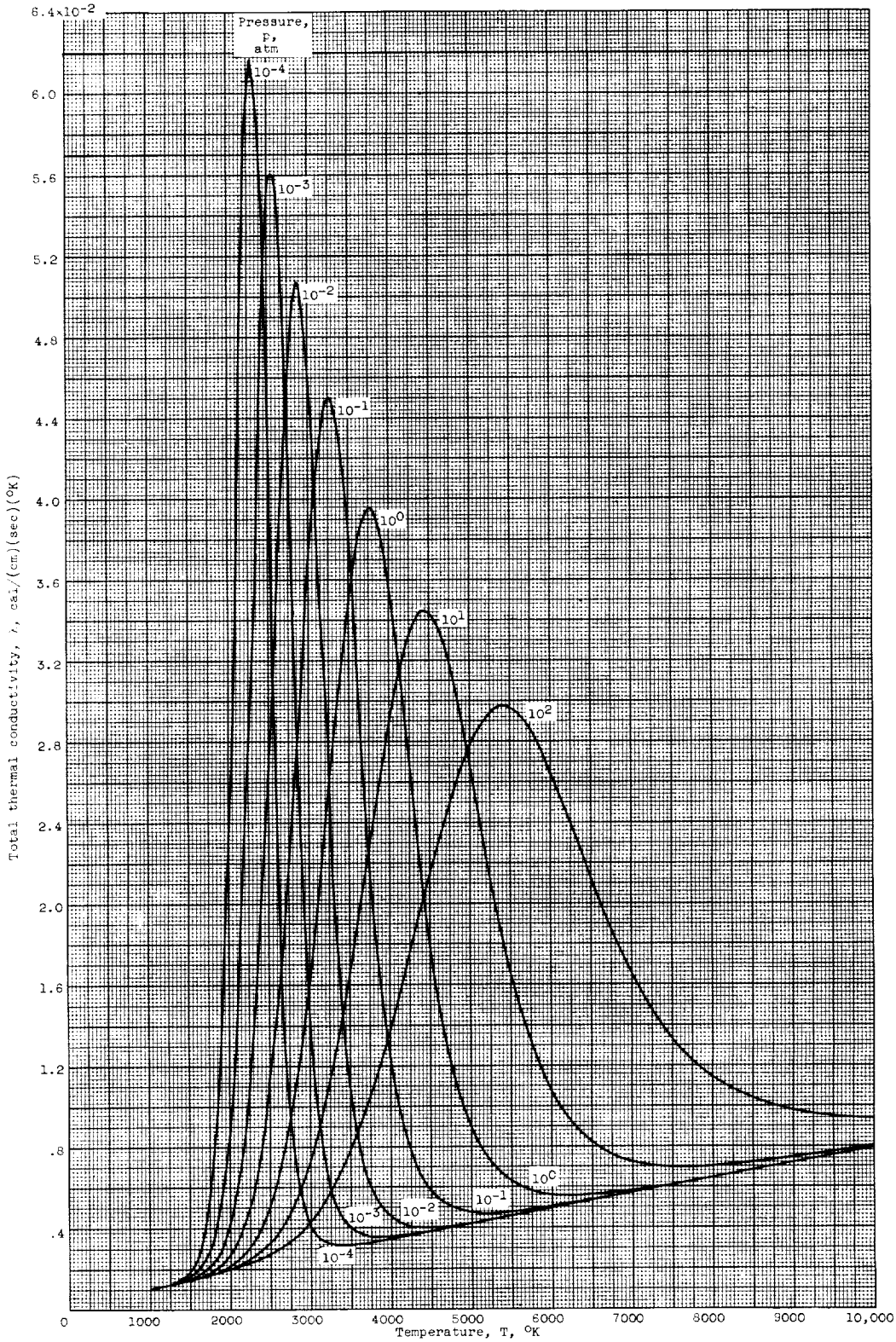
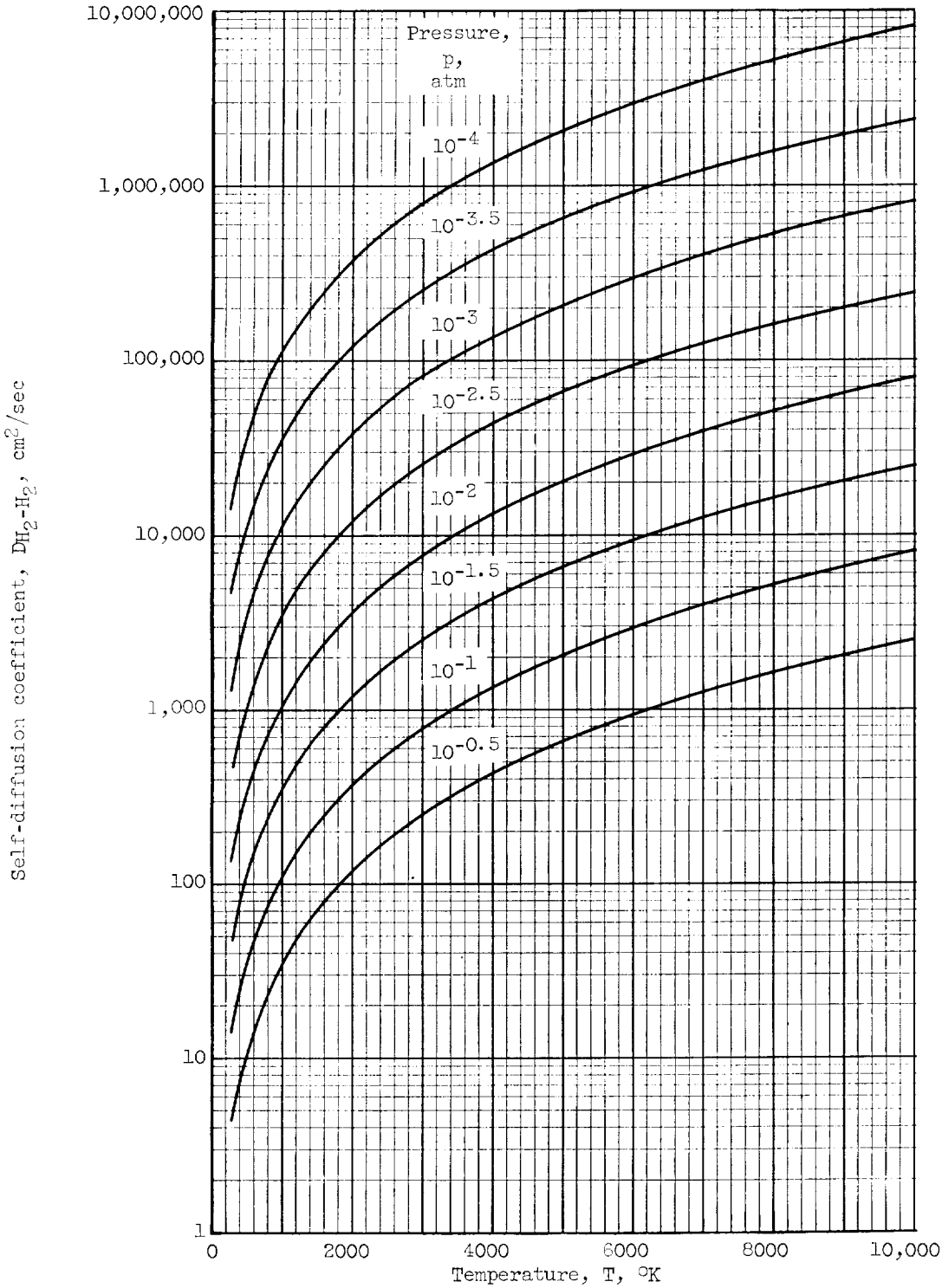
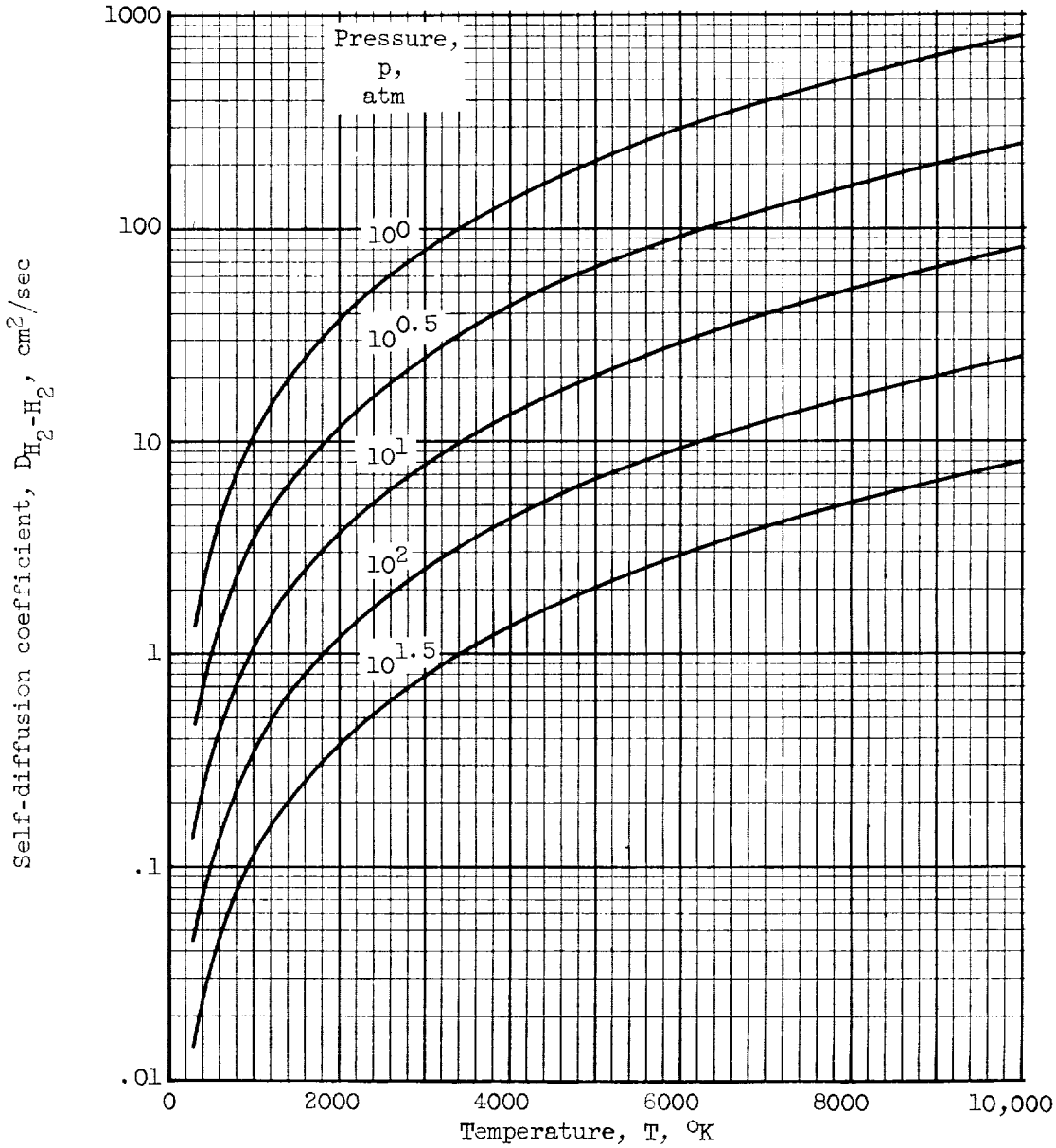


Figure 3. - Total thermal conductivity of gaseous hydrogen for temperatures from 300° to 10,000° K and pressures from 10^{-4} to 10^{2} atmospheres.



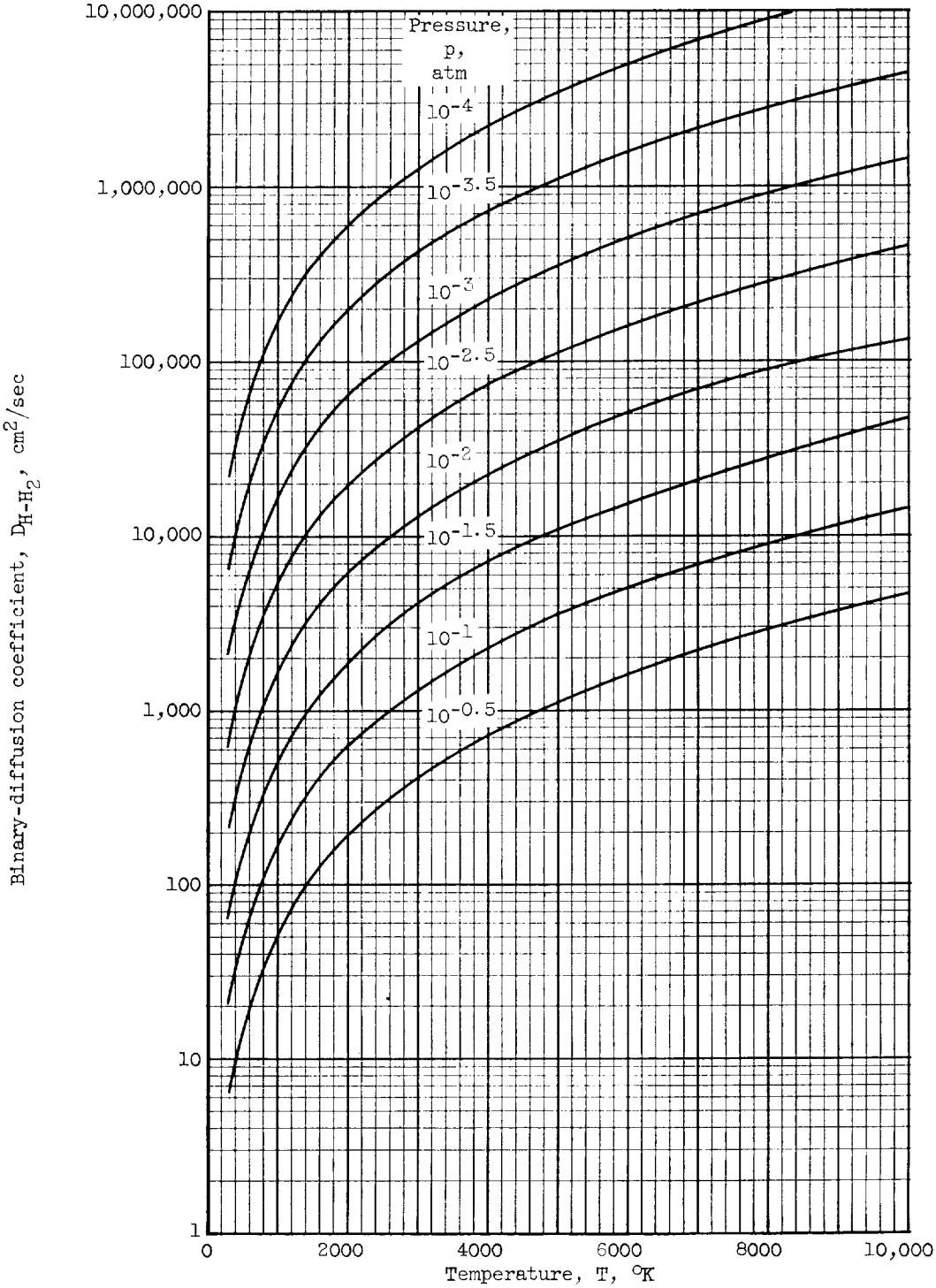
(a) Pressure, 10^{-4} to $10^{-0.5}$ atmosphere.

Figure 4. - Self-diffusion coefficient of molecular hydrogen for temperatures from 300° to 10,000° K.



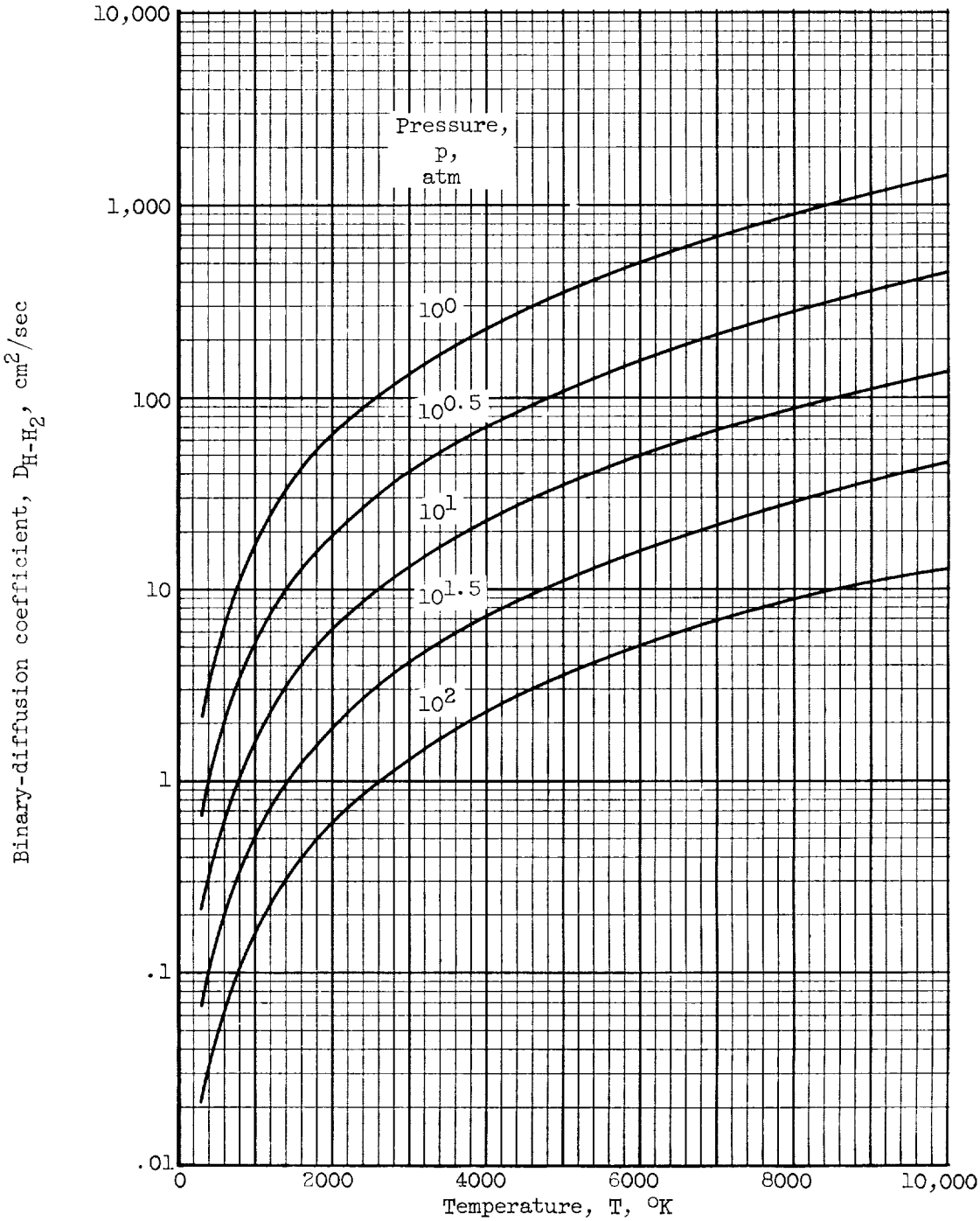
(b) Pressure, 10^0 to 10^2 atmospheres.

Figure 4. - Concluded. Self-diffusion coefficient of molecular hydrogen for temperatures from 300° to 10,000° K.



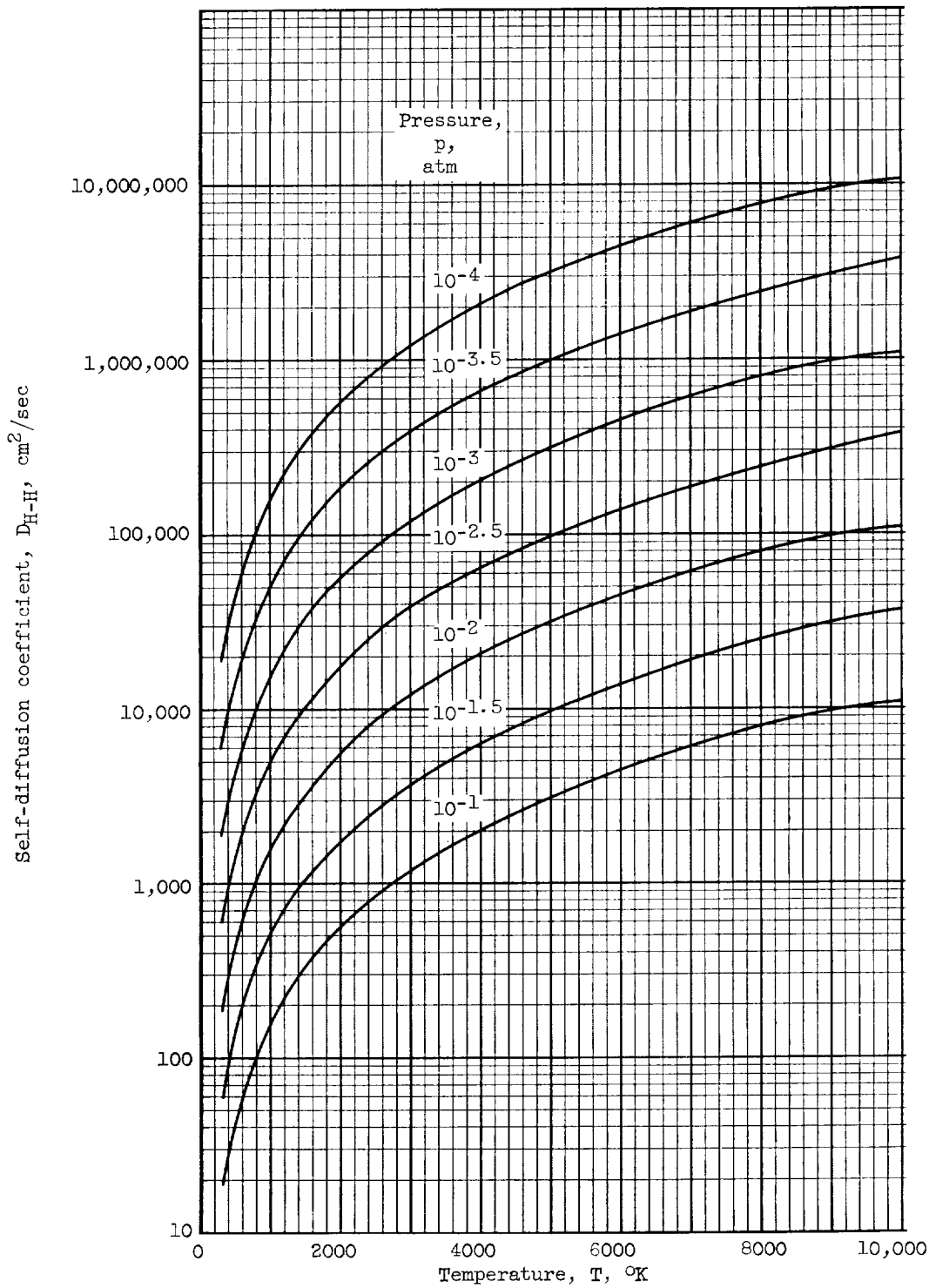
(a) Pressure, 10^{-4} to $10^{-0.5}$ atmosphere.

Figure 5. - Binary-diffusion coefficient of mixture of hydrogen atoms and molecules for temperatures from 300° to 10,000 °K.



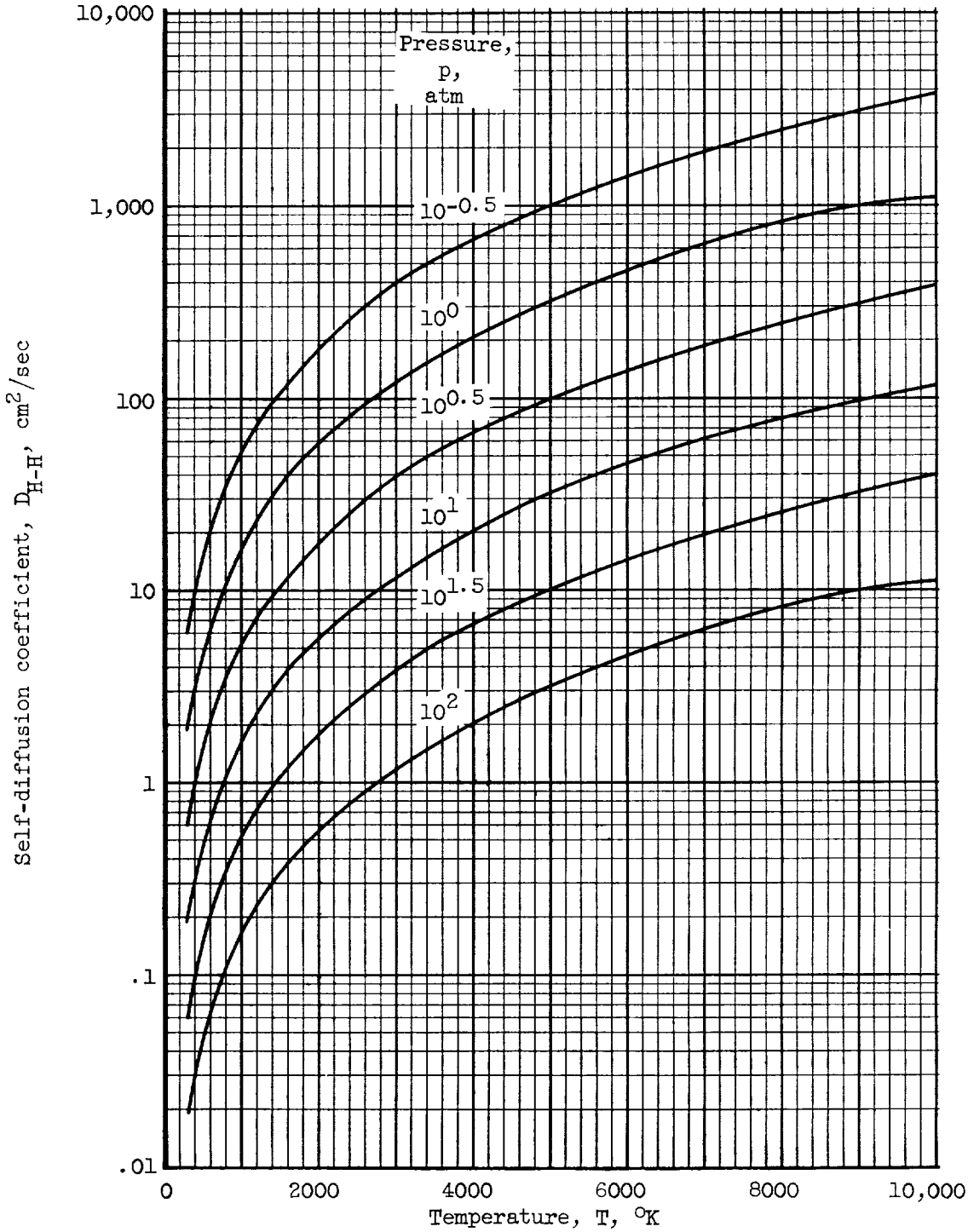
(b) Pressure, 10^0 to 10^2 atmospheres.

Figure 5. - Concluded. Binary-diffusion coefficient of mixture of hydrogen atoms and molecules for temperatures from 300° to 10,000° K.



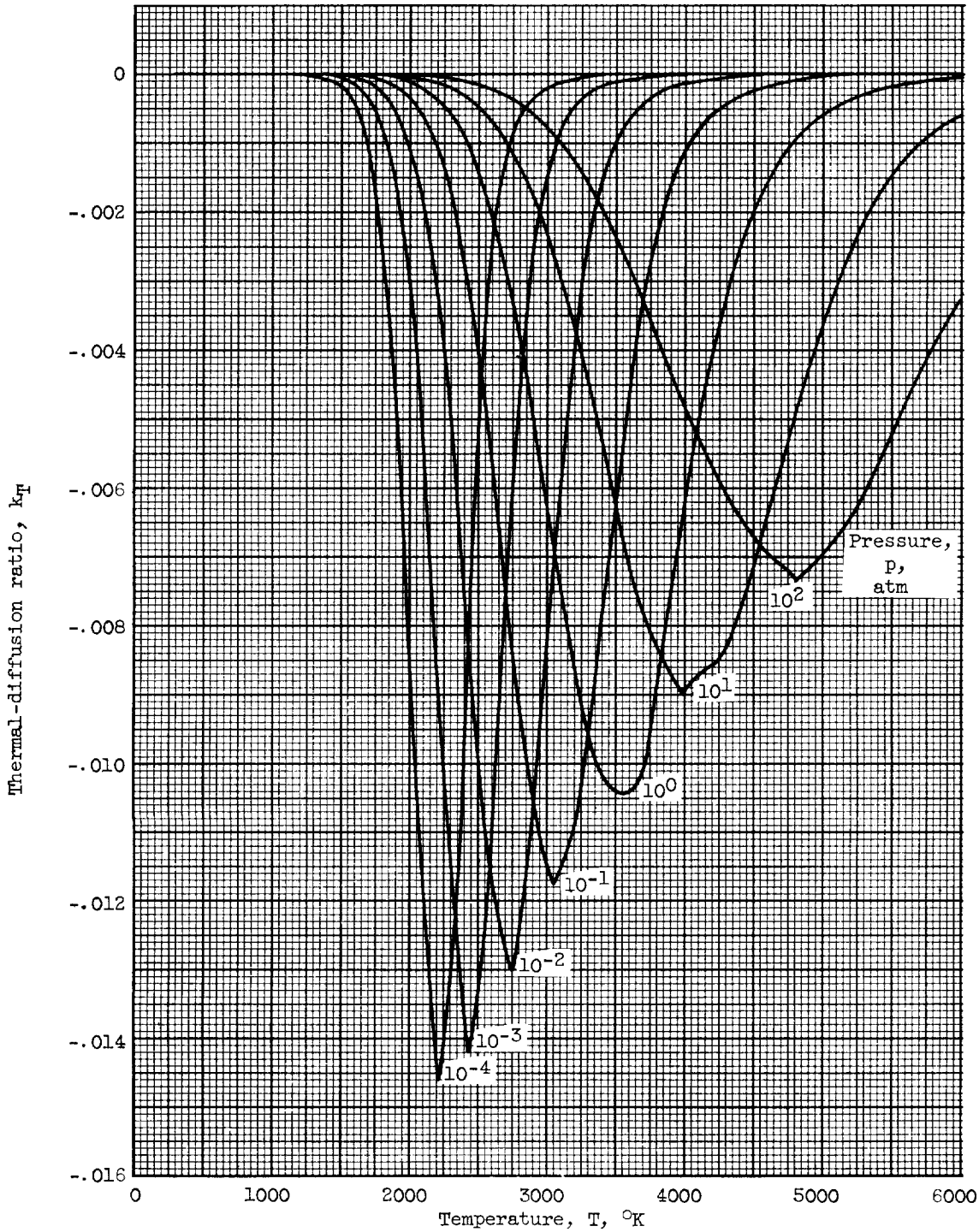
(a) Pressure, 10^{-4} to 10^{-1} atmosphere.

Figure 6. - Self-diffusion coefficient of atomic hydrogen for temperatures from 300° to 10,000° K.



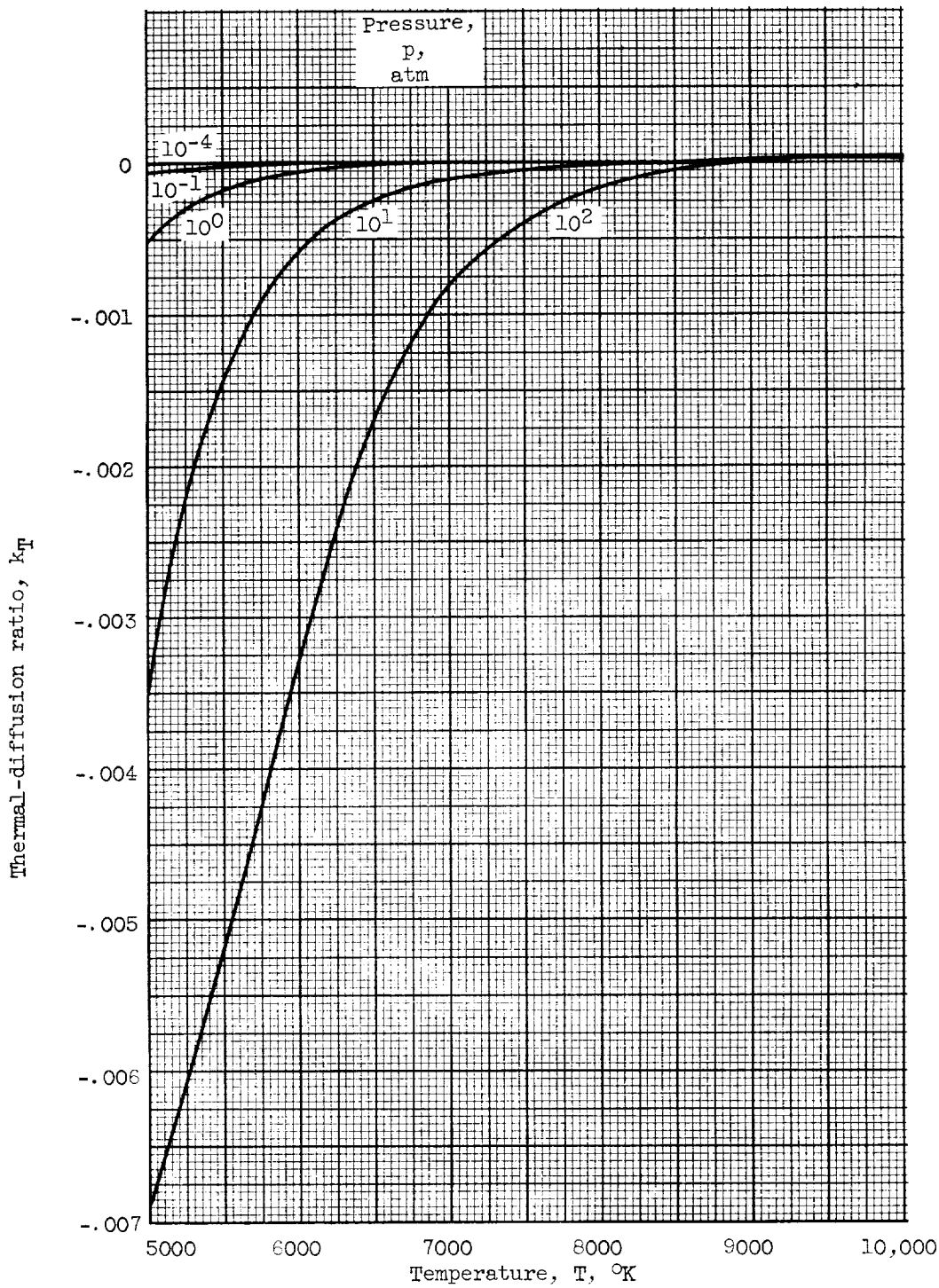
(b) Pressure, $10^{-0.5}$ to 10^{2} atmospheres.

Figure 6. - Concluded. Self-diffusion coefficient of atomic hydrogen for temperatures from 300° to 10,000° K.



(a) Temperature, 300° to 6000° K.

Figure 7. - Thermal-diffusion ratio of gaseous hydrogen for pressures from 10^{-4} to 10^2 atmospheres.



(b) Temperature, 5000° to 10,000° K.

Figure 7. - Concluded. Thermal-diffusion ratio of hydrogen for pressures from 10^{-4} to 10^{2} atmospheres.

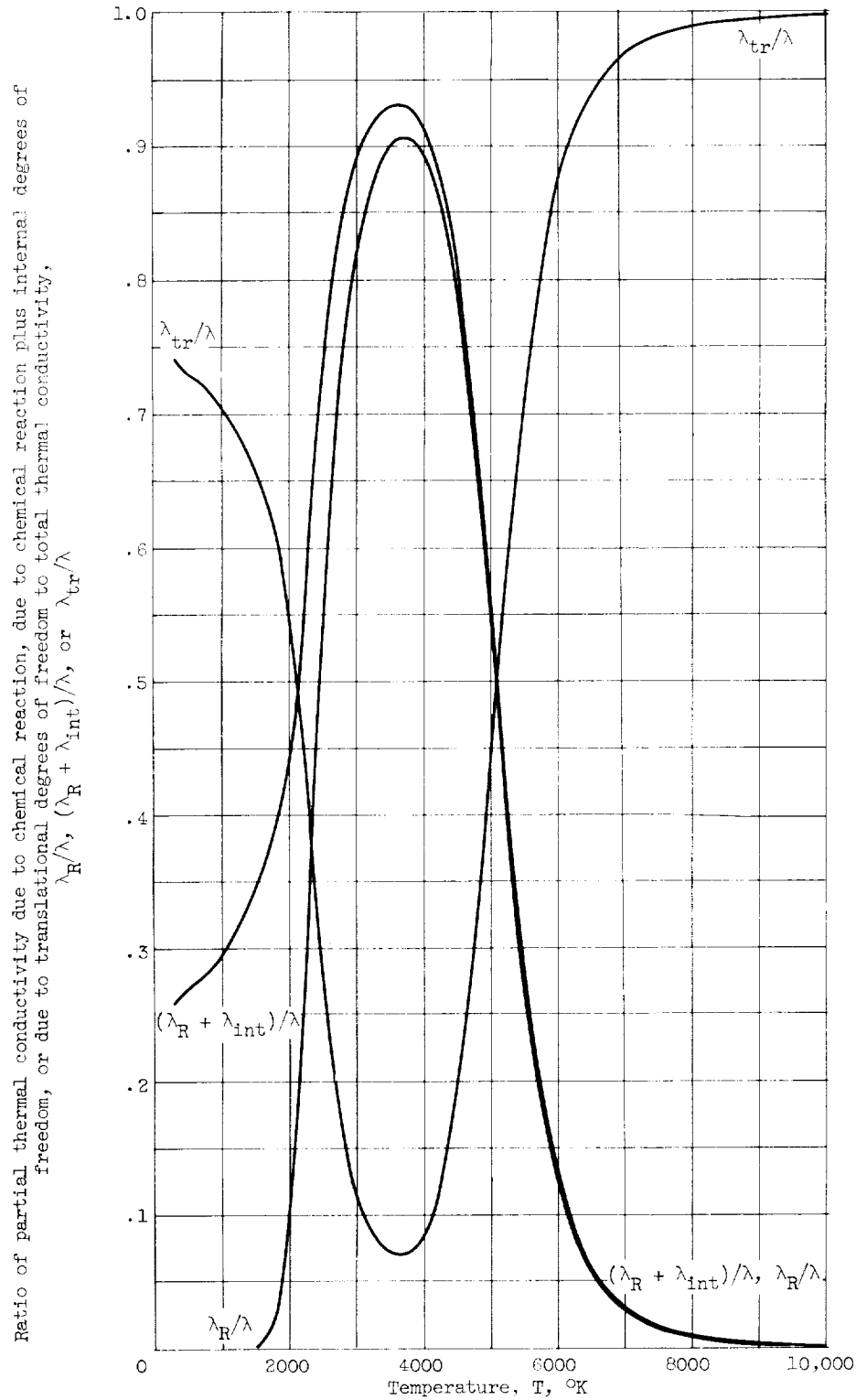


Figure 8. - Ratios of partial thermal conductivities of hydrogen to total thermal conductivity as functions of temperature from 300° to 10,000° K at pressure of 1 atmosphere.

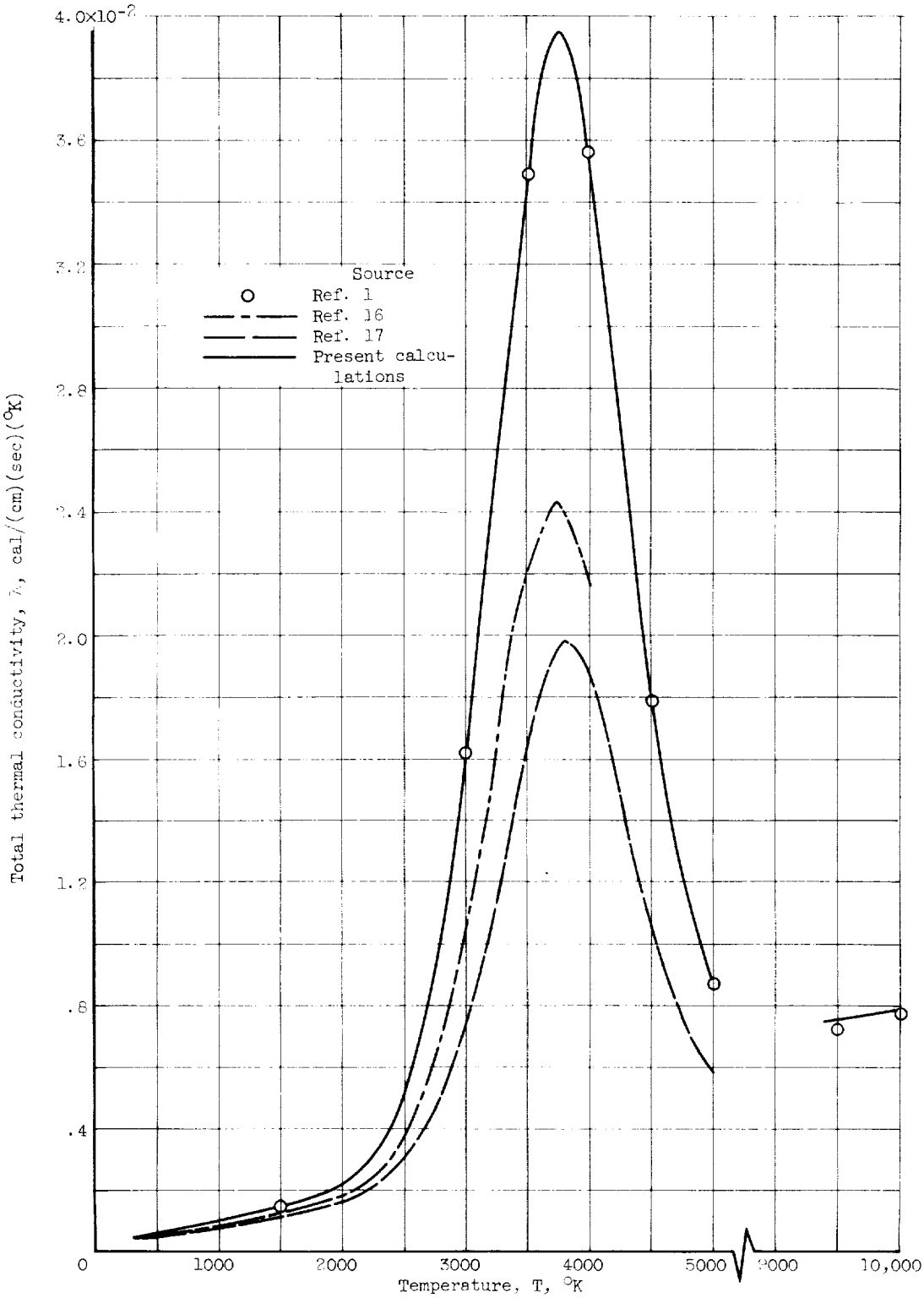


Figure 9. - Comparison of calculated values of total thermal conductivities with those of references 1, 16, and 17 as functions of temperature from 300° to 10,000° K at pressure of 1 atmosphere.

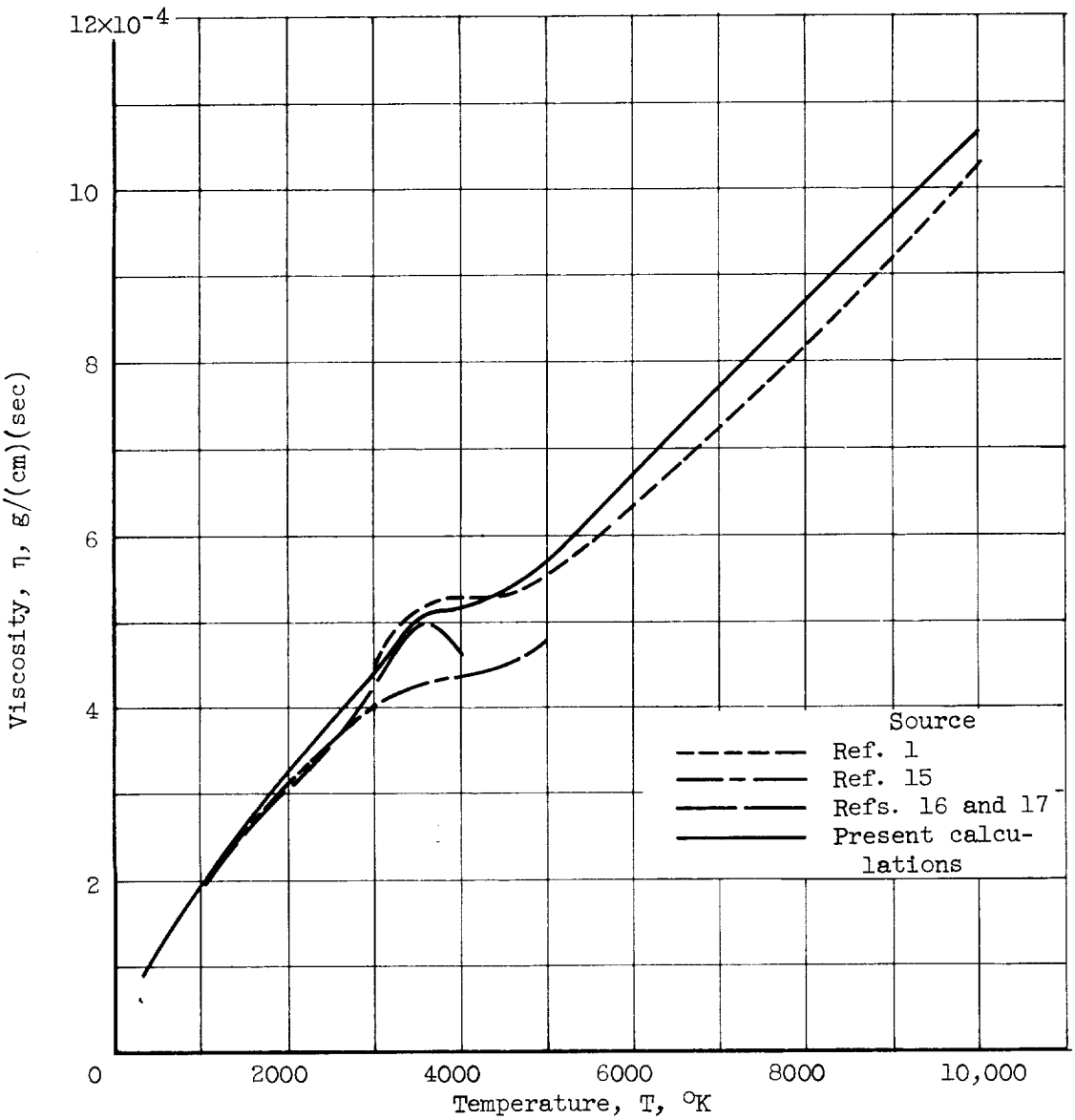


Figure 10. - Comparison of calculated values for viscosity with those of references 1, 15, 16, and 17 at pressure of 1 atmosphere.

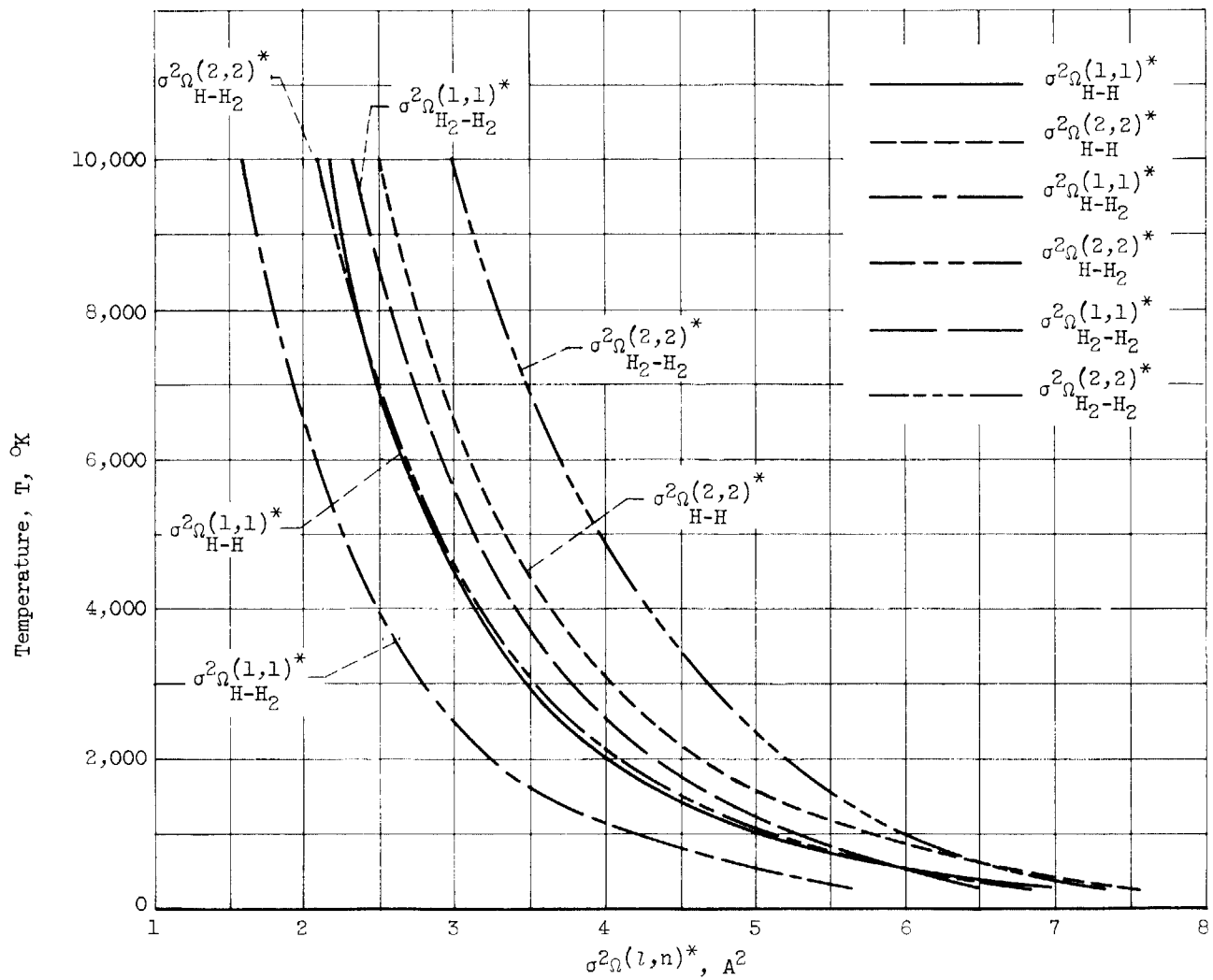


Figure 11. - The quantities $\sigma^2\Omega(1,1)^*$ and $\sigma^2\Omega(2,2)^*$ for H_2-H_2, H-H_2, and H-H interactions at temperatures from 300° to 10,000° K.