

CONVECTIVE HEAT TRANSFER FROM A HOT WIRE
TO A RAREFIED GAS BASED ON KINETIC THEORY

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LIST OF SYMBOLS

A	Surface area
a	Accommodation coefficient
D_w	Wire diameter
E_o	Average energy transport of incident molecules per unit time
E_{to}	Average energy transport per unit time, corresponding to the surrounding temperature, T_o , of incident molecules
E_w	Average energy transport per unit time, corresponding to the wire temperature, T_w , of rebounding molecules
e	Average molecular energy transport
e_o	Average molecular energy transport, corresponding to the surrounding temperature, T_o , of an incident molecule
e_r	Average molecular energy transport of a rebounding molecule
e_{to}	Average translation energy of an incident molecule at temperature, T_o
e_{tw}	Average translation energy of a rebounding molecule at temperature, T_w
e_w	Average molecular energy transport of a rebounding molecule at temperature, T_w
f	Number of degrees of freedom
k	Boltzmann constant
k'	Thermal conductivity
Kn	Knudsen number
l	Length of wire
m	Mass of a molecule
N	Number of molecules per unit volume
n	Total number of molecules
n_s	Number of molecules striking unit surface area per unit time
P	Pressure

Q	Heat transfer rate per unit time
q	Local heat transfer rate per unit surface area and unit time
T_0	Temperature of surrounding region
T_r	Temperature of the rebounding molecules
T_w	Wire temperature
V	Molecular speed
$\bar{V}$	Average speed
$\overline{V^2}$	Average value of the square of the speed of all molecules
V_m	Most probable molecular speed
γ	Ratio of specific heat at constant pressure to specific heat at constant volume
λ	Mean free path of a molecule
ρ	Radius of a molecule
σ	Collision cross section of a molecule

SYSTEM OF UNITS

MKS - System

Length	m
Mass	kg
Time	sec
Force	Newton
Energy	joule
Temperature	°K

INTRODUCTION

This theoretical paper deals with the convective heat transfer from a wire to a gas at rest. The gas is assumed to be at a very low density, the so called "Free Molecular Regime". In this regime, the heat loss from the wire is proportional to the gas pressure (1). In the "Free Molecular Regime", as compared to atmospheric pressure conditions, there is no distinct temperature gradient because the mean free path of the molecules is too big compared with the wire diameter. Therefore it is impossible to calculate the convective heat transfer by classical methods, but the use of kinetic theory is necessary.

KINETIC THEORY

Description

The kinetic theory applies the laws of mechanics to the individual molecules of a system, and from these laws derives, for example, expressions for the pressure of a gas and its internal energy. In order to apply the kinetic theory to a gas, some assumptions have to be made.

Basic Assumptions

1. Matter is composed of small discrete units known as molecules. The three states of matter differ only in the arrangement and state of motion of the molecules.
2. Molecules exert no forces on one another except when they collide. Therefore, between collisions, they move in straight lines.

The interaction of gas molecules in collisions with each other and with a surface can be treated in accordance with the conservation laws of classical mechanics.

3. Statistical methods can be used. This implies the "principle of molecular chaos", and a "smoothing out of fluctuations".

Simplifications

1. The molecule is pictured as a hard elastic sphere having no force field, the so called "billiard ball model".

2. The molecules are distributed uniformly throughout the space under consideration.

3. The number of molecules is sufficiently large that any small element of volume will still contain a sufficient number of molecules to give meaning to gas properties.

4. All directions of molecular velocities are equally probable. Velocity components are statistically independent (2).

DEFINITIONS

Free Molecular Regime

There is no unique definition of the "free molecular regime". Hirschfelder, Curtiss, and Bird (3) define it as the regime in which the mean free path is of the same order of magnitude as the dimensions of an object immersed in the gas.

Present (4) restricts the regime somewhat. His definition of the "free molecule flow" is that the mean free path, λ , of a molecule is sufficiently long that collisions between gas molecules

become negligible near the object immersed in the gas. For this reason, the energy transport into the gas is determined almost entirely by the collisions of the molecules with the object and is practically unaffected by intermolecular collisions.

Eckert and Drake (5) give nearly the same definition. They define the "free molecule flow" as one where the mean free path, λ , is very much larger than any significant body dimension, D_w . This last definition is also given by Devienne (6).

In this paper, the "free molecular regime" is defined as the region where the mean free path, λ , is five or more times bigger than the significant dimension, D_w , of the wire immersed in the gas: $\lambda \geq 5D_w$. It is important to note that the mean free path is not the distance between molecules, so that even in highly rarefied gas, there are still a sufficient number of molecules in a unit volume of the gas to give meaning to gas properties such as density and temperature.

Mean Free Path

Since the gas under consideration is composed of impenetrable elastic spheres, a collision between two molecules is well defined. This makes it possible to introduce a quantity known as the "mean free path", λ , which is the average distance traveled by a molecule between collisions (3).

Sears (2) assumes that except for the test molecule, all other molecules are stationary. The test molecule moves among the others with an average speed, $\bar{V}$. The molecules have a radius, ρ . At the instant of a collision, the center-to-center distance of the

colliding molecules is 2ρ . This results in an effective cross-sectional area of the moving molecule, called its "collision cross section", σ , of

$$\sigma = 4\pi\rho^2 \quad (3.1)$$

If there are N molecules per unit volume, the number of collisions per unit time, called the "collision frequency", z , is therefore

$$z = \sigma \cdot N \cdot \bar{v} \quad (3.2)$$

The mean free path, λ , equals the total distance covered in time, t , divided by the number of collisions in this time.

$$\lambda = \frac{\bar{v}t}{\sigma Nt}$$

or

$$\lambda = \frac{1}{\sigma N} \quad (3.3)$$

Hirschfelder, Curtiss, and Bird (3) make a different assumption to calculate the mean free path, λ . They assume that one-sixth of the total number of molecules per unit volume moves in each positive and negative direction in space. This assumption leads to a mean free path of

$$\lambda = \frac{1}{\xi \sigma N} \quad (3.4)$$

where

$$\xi = \frac{1}{3} + \frac{2}{3} \sqrt{2}$$

In this report Sear's corrected equation for λ is used, which assumes Maxwellian velocity distribution and takes into account the relative velocities and results in

$$\lambda = \frac{1}{\sqrt{2}} \cdot \frac{1}{\sigma N} \quad (3.5)$$

Knudsen Number

Gohhart (7) defines the "Knudsen number", Kn , as the number which results if one divides the mean free path, λ , by the characteristic body dimension, D_w :

$$Kn = \frac{\lambda}{D_w} \quad (3.6)$$

Average Speed

The "average speed", $\bar{v}$, is found by adding together the speeds of all molecules, and dividing by the total number of molecules, n , (2).

$$\bar{v} = \frac{\sum_{i=1}^n v_i}{n} \quad (3.7)$$

Maxwell-Boltzmann Speed Distribution

By kinetic theory, the "Maxwell-Boltzmann speed distribution" is given by (2)

$$dn_v = \left(\frac{4n}{\sqrt{\pi}} \right) \left(\frac{m}{2k T_0} \right)^{3/2} v^2 e^{-(mv^2/2kT_0)} dv \quad (3.8)$$

Figure 1 shows the graph of a Maxwell-Boltzmann speed distribution function.

Most Probable Molecular Speed

The most probable molecular speed, V_m , is the speed corresponding to the maximum point on the graph of a Maxwell-Boltzmann speed distribution function. In other words, more molecules have the speed, V_m , than have any other speed. It is found in setting the first derivative of the Maxwell-Boltzmann speed distribution function to zero, which gives (2)

$$V_m = \left(\frac{2k T_0}{m} \right)^{1/2} \quad (3.9)$$

Accommodation Coefficient

Consider a gas molecule which possesses a certain energy, e_0 , corresponding to the temperature of the surrounding gas, T_0 . Upon collision with the heated wire this molecule would ideally acquire an energy, e_w , corresponding to the wire temperature, T_w . However the molecule rebounds with an energy, e_r , which is usually different from e_w . The accommodation coefficient, a , is then given by (6), (8)

$$a = \frac{e_r - e_0}{e_w - e_0} \quad (3.10)$$

The accommodation coefficient as defined above is concerned with the total energy of a particular molecule.

Number of Degrees of Freedom and the Average Energy Connected with each Degree of Freedom

The number of "degrees of freedom" of a molecule is that number of coordinates necessary to define its geometrical location and orientation (3).

From kinetic theory, the average molecular energy for each degree of freedom is (2)

$$e = \frac{1}{2} kT \quad (3.11)$$

It follows that the average total energy of a molecule is

$$u = \frac{f}{2} kT \quad (3.12)$$

A distinction can be made between the degrees of freedom due to translation, rotation, and vibration (2), (9), (10).

DEVELOPMENT OF AN EQUATION FOR THE CONVECTIVE HEAT TRANSFER FROM A WIRE TO A RAREFIED GAS

The convective heat transfer from a wire to a gas in the free molecular regime is governed by the energy balance,

$$\frac{q}{A_s} = e_r - e_o \quad (4.1)$$

where

$$q = \frac{dQ}{dt}$$

is the convective heat transfer rate to the gas per unit surface area of the wire.

Also

$$n_s e_o = \frac{d E_o}{dA}$$

is the energy transport rate of the incident molecules to the wire per unit surface area and unit time, and n_s is the number of molecules striking unit surface area per unit time.

From the definition of the accommodation coefficient

$$a = \frac{e_r - e_o}{e_w - e_o} \quad (3.10)$$

where

$$n_s e_w = \frac{dE_w}{dA}$$

is the transport rate of energy away from the wire, corresponding to a wire temperature, T_w , of rebounding molecules.

Substitution of equation (3.10) into equation (4.1) yields

$$\frac{q}{a \cdot n_s} = e_w - e_o \quad (4.2)$$

Note that for a given temperature and a given gas the accommodation coefficient can only be determined by experiment, as it depends on the material, the structure, and the surface condition of the wire (8).

The assumption which pictures the molecule as a "billiard ball" is now dropped.

From equation (3.12), the average total energy of a molecule is

$$u = \frac{f}{2} kT \quad (3.11)$$

By definition (8)

$$\gamma = \frac{c_p}{c_v} = \frac{(\partial/\partial T)_p (u + kT)}{(\partial u/\partial T)_v} = 1 + \frac{2}{f} \quad (4.3)$$

Substituting definition (4.3) into equation (3.11) yields

$$u = \frac{1}{(\gamma - 1)} kT \quad (4.4)$$

The translational energy of a molecule rebounding from the wire at a temperature, T_w , is (8)

$$e_{tw} = 2 kT$$

This expression is $4/3$ times as great as the mean translational energy of a gas in equilibrium at the same temperature (2).

Since the translational part of energy in equilibrium is due to three degrees of freedom, it follows that

$$n_s e_w = n_s e_{tw} + \frac{f-3}{2} n_s k T_w = \frac{f+1}{2} n_s k T_w = \frac{\gamma+1}{2(\gamma-1)} n_s k T_w \quad (4.5)$$

Similarly, the energy transport rate to the wire of an incident molecule is

$$n_s e_o = n_s e_{to} + \frac{f-3}{2} n_s k T_o = n_s e_{to} + \frac{5-3\gamma}{2(\gamma-1)} n_s k T_o \quad (4.6)$$

where

$$n_s e_{to} = \frac{dE_{to}}{dA}$$

is the translational energy transport rate to the wire corresponding to a surrounding temperature, T_o .

Substitution of equations (4.5) and (4.6) into equation (4.2) gives

$$\frac{q}{a} = \frac{\gamma + 1}{2} n_s k T_w - (n_{set0} + \frac{\gamma - 3}{2} n_s k T_0)$$

or

$$\frac{q}{a} = \frac{\gamma + 1}{2(\gamma - 1)} n_s k T_w - (n_{set0} \frac{5 - 3\gamma}{2(\gamma - 1)} n_s k T_0) \quad (4.7)$$

From kinetic theory (2), (3)

$$n_s = \frac{N V_M}{2\sqrt{\pi}} \quad (4.8)$$

and

$$n_{set} = \left(\frac{5}{2} n_s - \frac{N V_M}{4\sqrt{\pi}} \right) k T_0$$

or

$$n_{set0} = 2n_s k T_0 \quad (4.9)$$

Substitution of equations (4.8) and (4.9) into equation (4.7) yields

$$\frac{q}{a} = \frac{\gamma + 1}{2(\gamma - 1)} \frac{N V_M}{2\sqrt{\pi}} k T_w - \left(2 \frac{N V_M}{2\sqrt{\pi}} k T_0 + \frac{5 - 3\gamma}{2(\gamma - 1)} \frac{N V_M}{2\sqrt{\pi}} k T_0 \right)$$

or

$$\frac{q}{a} = \frac{1}{2\sqrt{\pi}} k T_0 \cdot N \cdot V_M \left[\frac{\gamma + 1}{2(\gamma - 1)} \frac{T_w}{T_0} - \left(2 + \frac{5 - 3\gamma}{2(\gamma - 1)} \right) \right] \quad (4.10)$$

After rearrangement and putting into a dimensionless form, equation (4.10) becomes

$$\frac{2 \cdot \sqrt{\pi} \cdot q}{a \cdot k \cdot T_0 \cdot N \cdot V_M} = \frac{\gamma + 1}{2(\gamma - 1)} \frac{T_M}{T_0} - \left(2 + \frac{5 - 3\gamma}{2(\gamma - 1)} \right) \quad (4.11)$$

This equation is somewhat similar to the one Oppenheim (8) developed for the heat transfer from a body of general geometry to a moving rarefied gas.

The difference of equation (4.11) compared to Oppenheim's equation is its lack of generality and the fact that equation (4.11) is based on the assumption that the local heat transfer is the same over the entire wire. On the other hand, Oppenheim's equation does not cover the heat transfer from a wire to a gas at rest. Furthermore, Oppenheim's equation applied to a body of cylindrical shape contains an indeterminate surface integral.

Both equations have the assumption that the wire is long enough that the end effects can be neglected.

COMPARISON EQUATION FOR AIR

Baldwin (11) published the results of a study concerning heat loss from hot wires in rarefied gases. He gives an equation for the conductive heat transfer which is valid for still air with Knudsen numbers greater than five.

$$Nu = \frac{q}{\pi \cdot l \cdot k \cdot (T_W - T_0)} = 0.303 \cdot a \cdot \frac{1}{Kn} \quad (5.1)$$

For purposes of comparison, equation (5.1) can be rearranged as

$$q = 0.303 \cdot \pi \cdot a \cdot \frac{1}{K_n} \cdot 1 \cdot k' (T_w - T_o)$$

and then

$$q = 0.303 \cdot a \cdot \frac{1}{D_w \cdot K_n} \cdot k' (T_w - T_o) \quad (5.2)$$

Baldwin fails to state the assumptions made and the procedure used to obtain equation (5.1). However, he points out that the results of equation (5.1) check reasonably well with test results if the accommodation coefficient is assumed to have a value of approximately 0.3. In this paper equation (4.11) is compared with equation (5.1) and the results are shown in Figures 2 and 3.

CALCULATION OF THE HEAT TRANSFER AND DISCUSSION OF THE RESULTS

From equation (4.10)

$$\frac{q}{a} = \frac{1}{2\sqrt{\pi}} k \cdot T_o \cdot N \cdot V_m \left[\frac{\gamma + 1}{2(\gamma - 1)} \cdot \frac{T_w}{T_o} - \left(2 + \frac{\gamma - 3\gamma}{2(\gamma - 1)} \right) \right] \quad (4.10)$$

the heat transfer rate per unit time and unit area can be calculated. To reduce the number of variables and put the above equation into a form

$$\frac{q}{a} = f(K_n, T_o, T_w, D_w, m, \rho, \gamma)$$

some substitutions have to be made.

From equation (3.9), the most probable molecular speed, v_m , is

$$v_m = \left(\frac{2 k T_0}{m} \right)^{\frac{1}{2}} \quad (3.9)$$

From kinetic theory (2), the pressure is

$$P = \frac{1}{3} N \cdot m \cdot \overline{v^2} \quad (6.1)$$

where $\overline{v^2}$ is the average value of the square of the speed of all molecules and is given by (2)

$$\overline{v^2} = \frac{3k T_0}{m} \quad (6.2)$$

Substituting equation (6.2) into equation (6.1) yields

$$P = N k T_0$$

and

$$N = \frac{P}{k T_0} \quad (6.3)$$

From equation (3.5), the mean free path, λ , is given by

$$\lambda = \frac{1}{\sqrt{2}} \cdot \frac{1}{4 \pi \rho^2 N} \quad (3.5)$$

Substituting N from equation (6.3) into equation (3.5) yields

$$\lambda = \frac{1}{4 \pi \sqrt{2}} \cdot \frac{k T_0}{P \rho^2} \quad (6.4)$$

Using equation (6.4) and the Knudsen number, Kn , from equation (3.6) to evaluate the pressure gives

$$P = \frac{1}{4 \pi \sqrt{2}} \cdot \frac{k T_0}{\rho^2 \cdot D_w \cdot K_n} \quad (6.5)$$

Equation (6.5) substituted into equation (6.3) gives the number of molecules per unit volume as

$$N = \frac{1}{4\pi\sqrt{2}} \cdot \frac{1}{\rho^2 \cdot D_W \cdot Kn} \quad (6.6)$$

Finally, using equation (6.6) for N and equation (3.5) for V_m , the heat transfer rate per unit time and unit area from equation (4.10) becomes

$$\frac{q}{a} = \frac{1}{8\pi^{3/2}} \cdot (T_0 \cdot k)^{3/2} \cdot \frac{1}{\pi^{1/2} \cdot \rho^2} \cdot \frac{1}{D_W \cdot Kn} \cdot \left[\frac{\gamma + 1}{2(\gamma - 1)} \frac{T_W}{T_0} - \left(2 + \frac{5 - 3\gamma}{2(\gamma - 1)} \right) \right] \quad (6.7)$$

Using the numerical value of $1.38 \cdot 10^{-23}$ joules/ $^{\circ}\text{K} \cdot$ molecule for the Boltzmann constant, k , the equation for the pressure, P , becomes

$$P = 0.77664 \cdot 10^{-24} \cdot \frac{T_0}{\rho^2 \cdot D_W \cdot Kn} \left[\text{Newtons/m}^2 \right] \quad (6.8)$$

and equation (6.7) yields

$$\frac{q}{a} = 0.11528 \cdot 10^{-35} \cdot T_0^{3/2} \cdot \frac{1}{\pi^{1/2} \cdot \rho^2} \cdot \frac{1}{D_W \cdot Kn} \cdot \left[\frac{\gamma + 1}{2(\gamma - 1)} \frac{T_W}{T_0} - \left(2 + \frac{5 - 3\gamma}{2(\gamma - 1)} \right) \right] \left[\frac{\text{joules}}{\text{sec} \cdot \text{m}^2} \right] \quad (6.9)$$

To compare Baldwin's equation (5.2) with equation (6.9), it too has to be rearranged into a form

$$\frac{q}{a} = f(Kn, T_0, T_W, D_W).$$

From reference (12), the conductivity, k' , of air at rest is

$$k' = 0.0189 \left[1 + 0.00228 \left(\frac{T_0 + T_W}{2} - 273 \right) \right] \left[\frac{\text{watt}}{\text{m} \cdot ^\circ\text{K}} \right] \quad (6.10)$$

The values of this equation agree reasonably well with the tabulated values given by Logan and Treanor (14). After using the numerical value for the Boltzmann constant, k , and conversion of equation (6.10) to the MKS-system, equation (5.2) for the heat transfer per unit time and unit area becomes

$$\frac{q}{A} = 0.57267 \cdot 10^{-2} \cdot \left[1 + 0.228 \cdot 10^{-2} \cdot \left(\frac{T_0 + T_W}{2} - 273 \right) \right] \cdot \frac{1}{\text{Kn} \cdot D_W} (T_W - T_0) \left[\frac{\text{joules}}{\text{sec} \cdot \text{m}^2} \right] \quad (6.11)$$

Equations (6.9) and (6.11) have been translated into Fortran language and programs have been written to permit numerical evaluation of the heat transfer by use of the IBM 1620 computer. For the programs and flow diagrams, see appendix.

The heat transfer rate per unit time and unit area has been calculated for all possible combinations of the following tabulated values of Kn , T_0 , T_W , and D_W .

Kn	T_o	T_w	D_w
	$^{\circ}\text{K}$	$^{\circ}\text{K}$	m
5	293	400	0.001
10	333	500	
15	373	600	
20		700	
25		800	
30		900	
35		1000	
40			
45			
50			

Equation (6.11) has been evaluated for air only.

Equation (6.9) has been evaluated for air, argon, helium, O_2 , and N_2 .

The molecular mass, molecular radius and the value of δ is given in the following tabulated form (3), (13):

gas	δ	m	ρ
		kg	m
air	1.40000	$4.80680 \cdot 10^{-26}$	$1.84450 \cdot 10^{-10}$
argon	1.66670	$6.63030 \cdot 10^{-26}$	$1.73250 \cdot 10^{-10}$
helium	1.66670	$6.64390 \cdot 10^{-27}$	$1.23300 \cdot 10^{-10}$
O_2	1.40000	$5.31110 \cdot 10^{-26}$	$1.77050 \cdot 10^{-10}$
N_2	1.40000	$4.64990 \cdot 10^{-26}$	$1.87450 \cdot 10^{-10}$

The tabulated results are given in the appendix and are in the form $Kn, T_0, T_M, D_M, P, \frac{q}{A}$.

A comparison of the results of Baldwin's equation and equation (6.9) developed in this paper for air shows that with a ratio of $\frac{T_M}{T_0} = 3.425$, Baldwin's equation gives a heat transfer per unit time and unit area which is approximately 34% higher than that of equation (6.9). See Figure 2.

With a ratio of $\frac{T_M}{T_0} = 1.073$, Baldwin's equation yields results which are approximately 19.5% lower than are the results of equation (6.9). See Figure 3.

Equations (6.9) and (6.11) give about the same heat transfer rate with a ratio of $\frac{T_M}{T_0}$ of approximately 1.9. See Figure 4.

This disagreement between equation (6.9) and Baldwin's equation could be due to several factors. The following two could most likely be the reasons for the difference between the two equations.

a) It can be questioned how close equation (6.11), the best available information for the thermal conductivity, is in agreement with reality at the low pressures used. It also can be asked if the concept of thermal conductivity in the free molecular regime is valid.

b) The γ in equation (6.9) was assumed to be a constant over the entire temperature range considered. However γ is a function of the degrees of freedom as given by equation (4.3). With increasing temperature the molecules activate additional degrees of freedom due to vibration (15). With additional degrees of freedom, γ would decrease according to equation (4.3) and

$\frac{q}{a}$ of equation (6.9) would increase, but never more than 25% for a diatomic gas. This would reduce the discrepancy between the two equations at higher temperature ratios.

As there could not be found any experimental data for the heat transfer from a hot wire to a rarefied gas at rest, and, as pointed out before, the procedure used to obtain Baldwin's equation has not been published, any further discussion of the results obtained by equation (6.9) could not be based on any background material.

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APPENDIX

COMPUTER PROGRAMS AND FLOW DIAGRAMS

Symbols Used to Designate the Variables

G	γ
R	ρ
O	m
u	Kn
T _O	T _O
T _W	T _W
D _W	D _W
Q ₁	$\frac{q}{a}$ by equation (6.9)
Q ₂	$\frac{q}{a}$ by equation (6.11)
P	p

Program for Q1

```

10  Read 20, I, IA, IB, IC
20  FORMAT (I3, I3, I3, I3)
30  READ 40, DELIA, DELIB, DELIC
40  FORMAT (F4.0, F4.0, F4.0)
50  READ 60, U, TO, TW, DW
60  FORMAT (E12.5, E12.5, E12.5, E12.5)
    WT = TW
    OT = TO
    AU = U
70  DO 96 J = 1, I
80  READ 90, G, O, R

```

```

90  FORMAT (E12.5, E12.5, E12.5)
100 PUNCH 110, G, 0, R
110  FORMAT (E12.5, E12.5, E12.5)
      DO 97    K = 1, IA
      DO 98    L = 1, IB
      DO 99    M = 1, IC
      P = (.77664 E - 24) * T0/((R**2) * DW * U)
      A = (.11528 E - 35) * (T0**1.5)/((O**5)*(R**2)*DW*U)
      B = ((G+1.)/(2.*(G-1.)))*(TW/T0)-(2.+(5.-(3.*G))/
          (2.*(G-1.)))
      Q1 = A * B
      PUNCH 120, U, T0, TW, DW, P, Q1
120  FORMAT (E12.5, E12.5, E12.5, E12.5, E12.5, E12.5)
99   TW = TW + DELIC
      TW = WT
98   T0 = T0 + DELIB
      T0 = OT
97   U = U + DELIA
      U = AU
96   CONTINUE
      PAUSE
      END

```

Program for Q2

```

10  READ 20, I, IA, IB, IC
20  FORMAT (I3, I3, I3, I3)
30  READ 40, DELIA, DELIB, DELIC
40  FORMAT (F4.0, F4.0, F4.0)
50  READ 60, U, T0, TW, DW
60  FORMAT (E12.5, E12.5, E12.5, E12.5)

    WT = TW
    OT = T0
    AU = U

70  READ 80, G, O, R
80  FORMAT (E12.5, E12.5, E12.5)
90  PUNCH 100, G, O, R
100 FORMAT (E12.5, E12.5, E12.5)

    DO 97  K = 1, IA
    DO 98  L = 1, IB
    DO 99  M = 1, IC

    P = (.77664E - 24) * T0/((R**2) * DW * U)
    C = (.57267E - 02) * (1. + (.228E - 02) *
        ((T0+TW)/2.) - 273.))
    D = (1./(U*DW)) * T0 * ((TW/T0) - 1.)
    Q2 = C * D

    PUNCH 110, U, T0, TW, DW, P, Q2
110 FORMAT (E12.5, E12.5, E12.5, E12.5, E12.5, E12.5)
99  TW = TW + DELIC

    TW = WT

```


98 TO = TO + DELIB

TO = OT

99 U = U + DELLA

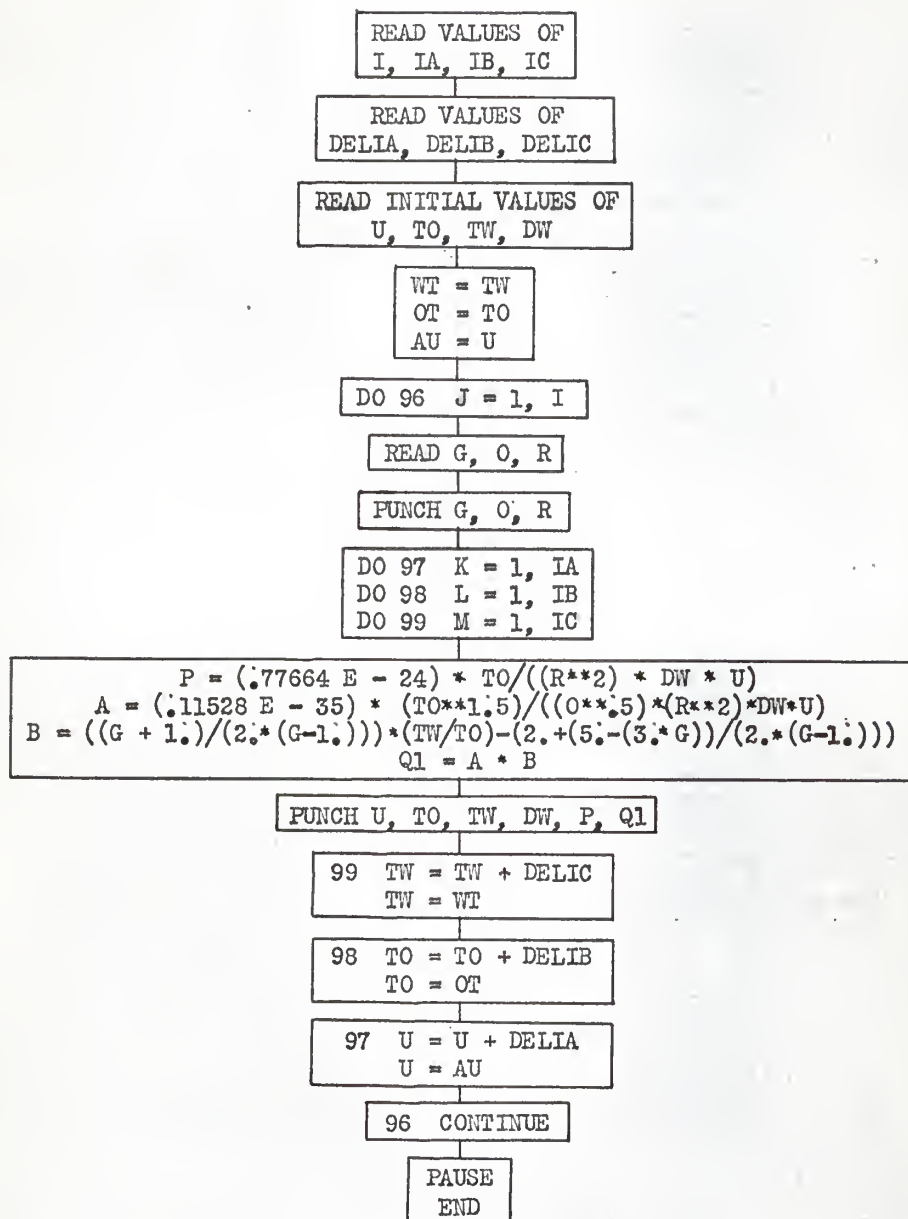
U = AU

PAUCE

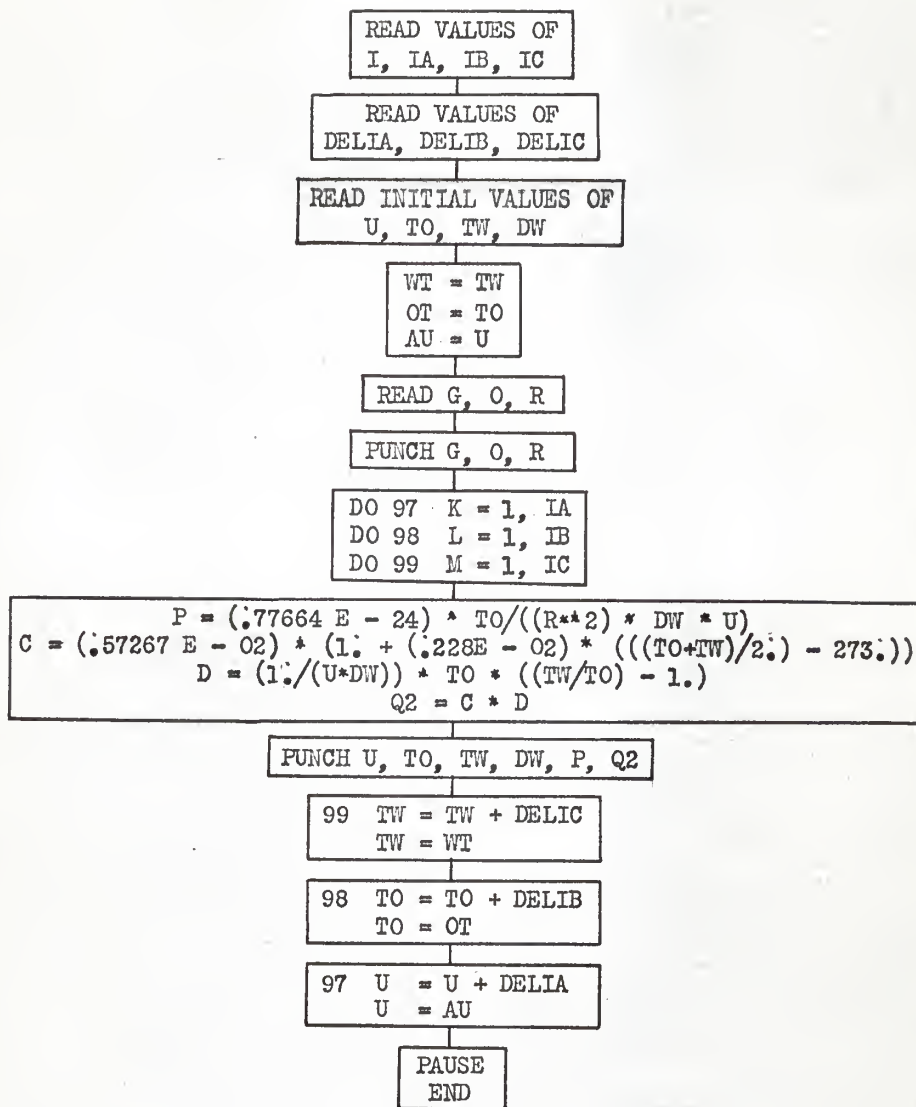
END

Flow Diagram for Q1





Flow Diagram for Q2



Results for Air from Baldwin's Equation

G O R
1.40000E-00 4.80680E-26 1.84450E-10

U	TO	TW	DW	P	Q2
5.00000E-00	2.93000E+02	4.00000E+02	1.00000E-03	1.33770E-00	1.43088E+02
5.00000E-00	2.93000E+02	5.00000E+02	1.00000E-03	1.33770E-00	3.03843E+02
5.00000E-00	2.93000E+02	6.00000E+02	1.00000E-03	1.33770E-00	4.90712E+02
5.00000E-00	2.93000E+02	7.00000E+02	1.00000E-03	1.33770E-00	7.03695E+02
5.00000E-00	2.93000E+02	8.00000E+02	1.00000E-03	1.33770E-00	9.42792E+02
5.00000E-00	2.93000E+02	9.00000E+02	1.00000E-03	1.33770E-00	1.20800E+03
5.00000E-00	2.93000E+02	1.00000E+03	1.00000E-03	1.33770E-00	1.49932E+03
5.00000E-00	3.33000E+02	4.00000E+02	1.00000E-03	1.52032E-00	9.30967E+01
5.00000E-00	3.33000E+02	5.00000E+02	1.00000E-03	1.52032E-00	2.53852E+02
5.00000E-00	3.33000E+02	6.00000E+02	1.00000E-03	1.52032E-00	4.40721E+02
5.00000E-00	3.33000E+02	7.00000E+02	1.00000E-03	1.52032E-00	6.53704E+02
5.00000E-00	3.33000E+02	8.00000E+02	1.00000E-03	1.52032E-00	8.92800E+02
5.00000E-00	3.33000E+02	9.00000E+02	1.00000E-03	1.52032E-00	1.15801E+03
5.00000E-00	3.33000E+02	1.00000E+03	1.00000E-03	1.52032E-00	1.44933E+03
5.00000E-00	3.73000E+02	4.00000E+02	1.00000E-03	1.70294E-00	3.89267E+01
5.00000E-00	3.73000E+02	5.00000E+02	1.00000E-03	1.70294E-00	1.99682E+02
5.00000E-00	3.73000E+02	6.00000E+02	1.00000E-03	1.70294E-00	3.86551E+02
5.00000E-00	3.73000E+02	7.00000E+02	1.00000E-03	1.70294E-00	5.99534E+02
5.00000E-00	3.73000E+02	8.00000E+02	1.00000E-03	1.70294E-00	8.38630E+02
5.00000E-00	3.73000E+02	9.00000E+02	1.00000E-03	1.70294E-00	1.10384E+03
5.00000E-00	3.73000E+02	1.00000E+03	1.00000E-03	1.70294E-00	1.39516E+03
1.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	6.68852E-01	7.15442E+01
1.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	6.68852E-01	1.51921E+02
1.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	6.68852E-01	2.45356E+02
1.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	6.68852E-01	3.51847E+02
1.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	6.68852E-01	4.71396E+02
1.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	6.68852E-01	6.04001E+02
1.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	6.68852E-01	7.49663E+02
1.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	7.60162E-01	4.65483E+01
1.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	7.60162E-01	1.26926E+02
1.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	7.60162E-01	2.20360E+02
1.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	7.60162E-01	3.26852E+02
1.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	7.60162E-01	4.46400E+02
1.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	7.60162E-01	5.79005E+02
1.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	7.60162E-01	7.24667E+02
1.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	8.51473E-01	1.94633E+01
1.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	8.51473E-01	9.98410E+01
1.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	8.51473E-01	1.93275E+02
1.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	8.51473E-01	2.99767E+02
1.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	8.51473E-01	4.19315E+02
1.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	8.51473E-01	5.51920E+02
1.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	8.51473E-01	6.97582E+02
1.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	4.45901E-01	4.76961E+01
1.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	4.45901E-01	1.01281E+02
1.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	4.45901E-01	1.63570E+02
1.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	4.45901E-01	2.34565E+02
1.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	4.45901E-01	3.14264E+02
1.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	4.45901E-01	4.02667E+02
1.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	4.45901E-01	4.99775E+02
1.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	5.06775E-01	3.10322E+01
1.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	5.06775E-01	8.46173E+01
1.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	5.06775E-01	1.46907E+02
1.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	5.06775E-01	2.17901E+02
1.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	5.06775E-01	2.97600E+02
1.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	5.06775E-01	3.86003E+02

U	TO	TW	DW	P	Q2
1.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	5.06775E-01	4.83111E+02
1.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	5.67649E-01	1.29755E+01
1.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	5.67649E-01	6.65606E+01
1.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	5.67649E-01	1.28850E+02
1.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	5.67649E-01	1.99844E+02
1.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	5.67649E-01	2.79543E+02
1.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	5.67649E-01	3.67946E+02
1.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	5.67649E-01	4.65054E+02
2.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.34426E-01	3.57721E+01
2.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.34426E-01	7.59609E+01
2.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.34426E-01	1.22678E+02
2.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.34426E-01	1.75923E+02
2.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.34426E-01	2.35698E+02
2.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.34426E-01	3.02000E+02
2.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.34426E-01	3.74831E+02
2.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.80081E-01	2.32741E+01
2.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.80081E-01	6.34630E+01
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.80081E-01	1.10180E+02
2.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.80081E-01	1.63426E+02
2.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.80081E-01	2.23200E+02
2.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.80081E-01	2.89502E+02
2.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.80081E-01	3.62333E+02
2.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.25736E-01	9.73167E+00
2.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.25736E-01	4.99205E+01
2.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.25736E-01	9.66377E+01
2.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.25736E-01	1.49883E+02
2.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.25736E-01	2.09657E+02
2.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.25736E-01	2.75960E+02
2.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.25736E-01	3.48791E+02
2.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.67540E-01	2.86177E+01
2.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.67540E-01	6.07687E+01
2.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.67540E-01	9.81425E+01
2.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.67540E-01	1.40739E+02
2.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.67540E-01	1.88558E+02
2.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.67540E-01	2.41600E+02
2.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.67540E-01	2.99865E+02
2.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.04065E-01	1.86193E+01
2.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.04065E-01	5.07704E+01
2.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.04065E-01	8.81442E+01
2.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.04065E-01	1.30740E+02
2.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.04065E-01	1.78560E+02
2.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.04065E-01	2.31602E+02
2.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.04065E-01	2.89867E+02
2.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.40589E-01	7.78534E+00
2.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.40589E-01	3.99364E+01
2.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.40589E-01	7.73102E+01
2.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.40589E-01	1.19906E+02
2.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.40589E-01	1.67726E+02
2.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.40589E-01	2.20768E+02
2.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.40589E-01	2.79032E+02
3.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.22950E-01	2.38480E+01
3.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.22950E-01	5.06406E+01
3.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.22950E-01	8.17854E+01
3.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.22950E-01	1.17282E+02
3.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.22950E-01	1.57132E+02
3.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.22950E-01	2.01333E+02
3.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.22950E-01	2.49887E+02
3.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.53387E-01	1.55161E+01
3.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.53387E-01	4.23086E+01

U	TO	TW	DW	P	Q2
3.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.53387E-01	7.34535E+01
3.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.53387E-01	1.08950E+02
3.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.53387E-01	1.48800E+02
3.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.53387E-01	1.93001E+02
3.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.53387E-01	2.41555E+02
3.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.83824E-01	6.48778E+00
3.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.83824E-01	3.32803E+01
3.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.83824E-01	6.44251E+01
3.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.83824E-01	9.99223E+01
3.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.83824E-01	1.39771E+02
3.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.83824E-01	1.83973E+02
3.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.83824E-01	2.32527E+02
3.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.91100E-01	2.04412E+01
3.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.91100E-01	4.34062E+01
3.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.91100E-01	7.01018E+01
3.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.91100E-01	1.00527E+02
3.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.91100E-01	1.34684E+02
3.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.91100E-01	1.72571E+02
3.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.91100E-01	2.14189E+02
3.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.17189E-01	1.32995E+01
3.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.17189E-01	3.62645E+01
3.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.17189E-01	6.29601E+01
3.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.17189E-01	9.33862E+01
3.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.17189E-01	1.27542E+02
3.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.17189E-01	1.65430E+02
3.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.17189E-01	2.07047E+02
3.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.43278E-01	5.56095E+00
3.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.43278E-01	2.85259E+01
3.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.43278E-01	5.52215E+01
3.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.43278E-01	8.56476E+01
3.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.43278E-01	1.19804E+02
3.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.43278E-01	1.57691E+02
3.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.43278E-01	1.99309E+02
4.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.67213E-01	1.78860E+01
4.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.67213E-01	3.79804E+01
4.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.67213E-01	6.13391E+01
4.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.67213E-01	8.79619E+01
4.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.67213E-01	1.17849E+02
4.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.67213E-01	1.51000E+02
4.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.67213E-01	1.87415E+02
4.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.90040E-01	1.16370E+01
4.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.90040E-01	3.17315E+01
4.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.90040E-01	5.50901E+01
4.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.90040E-01	8.17130E+01
4.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.90040E-01	1.11600E+02
4.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.90040E-01	1.44751E+02
4.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.90040E-01	1.81166E+02
4.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.12868E-01	4.86583E+00
4.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.12868E-01	2.49602E+01
4.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.12868E-01	4.83188E+01
4.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.12868E-01	7.49417E+01
4.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.12868E-01	1.04828E+02
4.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.12868E-01	1.37980E+02
4.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.12868E-01	1.74395E+02
4.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.48633E-01	1.58987E+01
4.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.48633E-01	3.37604E+01
4.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.48633E-01	5.45236E+01
4.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.48633E-01	7.81884E+01
4.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.48633E-01	1.04754E+02

U	TO	TW	DW	P	Q2
4.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.48633E-01	1.34222E+02
4.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.48633E-01	1.66591E+02
4.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.68925E-01	1.03440E+01
4.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.68925E-01	2.82057E+01
4.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.68925E-01	4.89690E+01
4.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.68925E-01	7.26337E+01
4.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.68925E-01	9.92000E+01
4.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.68925E-01	1.28667E+02
4.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.68925E-01	1.61037E+02
4.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.89216E-01	4.32518E-00
4.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.89216E-01	2.21868E+01
4.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.89216E-01	4.29501E+01
4.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.89216E-01	6.66148E+01
4.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.89216E-01	9.31811E+01
4.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.89216E-01	1.22648E+02
4.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.89216E-01	1.55018E+02
5.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.33770E-01	1.43088E+01
5.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.33770E-01	3.03843E+01
5.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.33770E-01	4.90712E+01
5.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.33770E-01	7.03695E+01
5.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.33770E-01	9.42792E+01
5.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.33770E-01	1.20800E+02
5.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.33770E-01	1.49932E+02
5.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.52032E-01	9.30967E-00
5.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.52032E-01	2.53852E+01
5.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.52032E-01	4.40721E+01
5.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.52032E-01	6.53704E+01
5.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.52032E-01	8.92800E+01
5.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.52032E-01	1.15801E+02
5.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.52032E-01	1.44933E+02
5.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.70294E-01	3.89267E-00
5.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.70294E-01	1.99682E+01
5.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.70294E-01	3.86551E+01
5.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.70294E-01	5.99534E+01
5.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.70294E-01	8.38630E+01
5.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.70294E-01	1.10384E+02
5.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.70294E-01	1.39516E+02

Results for Air from Equation (6.9)

G O R
1.40000E-00 4.80680E-26 1.84450E-10

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U	TO	TW	DW	P	Q1
5.00000E-00	2.93000E+02	4.00000E+02	1.00000E-03	1.33770E-00	1.69838E+02
5.00000E-00	2.93000E+02	5.00000E+02	1.00000E-03	1.33770E-00	3.28566E+02
5.00000E-00	2.93000E+02	6.00000E+02	1.00000E-03	1.33770E-00	4.87294E+02
5.00000E-00	2.93000E+02	7.00000E+02	1.00000E-03	1.33770E-00	6.46022E+02
5.00000E-00	2.93000E+02	8.00000E+02	1.00000E-03	1.33770E-00	8.04751E+02
5.00000E-00	2.93000E+02	9.00000E+02	1.00000E-03	1.33770E-00	9.63479E+02
5.00000E-00	2.93000E+02	1.00000E+03	1.00000E-03	1.33770E-00	1.12220E+03
5.00000E-00	3.33000E+02	4.00000E+02	1.00000E-03	1.52032E-00	1.13374E+02
5.00000E-00	3.33000E+02	5.00000E+02	1.00000E-03	1.52032E-00	2.82590E+02
5.00000E-00	3.33000E+02	6.00000E+02	1.00000E-03	1.52032E-00	4.51807E+02
5.00000E-00	3.33000E+02	7.00000E+02	1.00000E-03	1.52032E-00	6.21023E+02
5.00000E-00	3.33000E+02	8.00000E+02	1.00000E-03	1.52032E-00	7.90239E+02
5.00000E-00	3.33000E+02	9.00000E+02	1.00000E-03	1.52032E-00	9.59455E+02
5.00000E-00	3.33000E+02	1.00000E+03	1.00000E-03	1.52032E-00	1.12867E+03
5.00000E-00	3.73000E+02	4.00000E+02	1.00000E-03	1.70294E-00	4.83345E+01
5.00000E-00	3.73000E+02	5.00000E+02	1.00000E-03	1.70294E-00	2.27445E+02
5.00000E-00	3.73000E+02	6.00000E+02	1.00000E-03	1.70294E-00	4.06536E+02
5.00000E-00	3.73000E+02	7.00000E+02	1.00000E-03	1.70294E-00	5.85628E+02
5.00000E-00	3.73000E+02	8.00000E+02	1.00000E-03	1.70294E-00	7.64719E+02
5.00000E-00	3.73000E+02	9.00000E+02	1.00000E-03	1.70294E-00	9.43810E+02
5.00000E-00	3.73000E+02	1.00000E+03	1.00000E-03	1.70294E-00	1.12290E+03
1.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	6.68852E-01	8.49194E+01
1.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	6.68852E-01	1.64283E+02
1.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	6.68852E-01	2.43647E+02
1.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	6.68852E-01	3.23011E+02
1.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	6.68852E-01	4.02375E+02
1.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	6.68852E-01	4.81739E+02
1.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	6.68852E-01	5.61103E+02
1.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	7.60162E-01	5.66874E+01
1.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	7.60162E-01	1.41295E+02
1.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	7.60162E-01	2.25903E+02
1.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	7.60162E-01	3.10511E+02
1.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	7.60162E-01	3.95119E+02
1.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	7.60162E-01	4.79727E+02
1.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	7.60162E-01	5.64335E+02
1.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	8.51473E-01	2.41772E+01
1.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	8.51473E-01	1.13722E+02
1.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	8.51473E-01	2.03268E+02
1.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	8.51473E-01	2.92814E+02
1.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	8.51473E-01	3.82359E+02
1.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	8.51473E-01	4.71905E+02
1.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	8.51473E-01	5.61450E+02
1.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	4.45901E-01	5.66129E+01
1.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	4.45901E-01	1.09522E+02
1.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	4.45901E-01	1.62431E+02
1.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	4.45901E-01	2.15340E+02
1.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	4.45901E-01	2.68250E+02
1.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	4.45901E-01	3.21159E+02
1.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	4.45901E-01	3.74068E+02
1.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	5.06775E-01	3.77916E+01
1.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	5.06775E-01	9.41969E+01
1.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	5.06775E-01	1.50602E+02
1.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	5.06775E-01	2.07007E+02
1.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	5.06775E-01	2.63413E+02
1.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	5.06775E-01	3.19818E+02

U	TO	TW	DW	P	38 Q1
1.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	5.06775E-01	3.76223E+02
1.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	5.67649E-01	1.61181E+01
1.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	5.67649E-01	7.58152E+01
1.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	5.67649E-01	1.35512E+02
1.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	5.67649E-01	1.95209E+02
1.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	5.67649E-01	2.54906E+02
1.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	5.67649E-01	3.14603E+02
1.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	5.67649E-01	3.74300E+02
2.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.34426E-01	4.24597E+01
2.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.34426E-01	8.21417E+01
2.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.34426E-01	1.21823E+02
2.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.34426E-01	1.61505E+02
2.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.34426E-01	2.01187E+02
2.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.34426E-01	2.40869E+02
2.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.34426E-01	2.80551E+02
2.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.80081E-01	2.83437E+01
2.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.80081E-01	7.06477E+01
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.80081E-01	1.12951E+02
2.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.80081E-01	1.55255E+02
2.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.80081E-01	1.97559E+02
2.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.80081E-01	2.39863E+02
2.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.80081E-01	2.82167E+02
2.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.25736E-01	1.20886E+01
2.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.25736E-01	5.68614E+01
2.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.25736E-01	1.01634E+02
2.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.25736E-01	1.46407E+02
2.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.25736E-01	1.91179E+02
2.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.25736E-01	2.35952E+02
2.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.25736E-01	2.80725E+02
2.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.67540E-01	3.39677E+01
2.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.67540E-01	6.57133E+01
2.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.67540E-01	9.74589E+01
2.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.67540E-01	1.29204E+02
2.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.67540E-01	1.60950E+02
2.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.67540E-01	1.92695E+02
2.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.67540E-01	2.24441E+02
2.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.04065E-01	2.26749E+01
2.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.04065E-01	5.65181E+01
2.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.04065E-01	9.03614E+01
2.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.04065E-01	1.24204E+02
2.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.04065E-01	1.58047E+02
2.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.04065E-01	1.91891E+02
2.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.04065E-01	2.25734E+02
2.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.40589E-01	9.67091E-00
2.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.40589E-01	4.54891E+01
2.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.40589E-01	8.13073E+01
2.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.40589E-01	1.17125E+02
2.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.40589E-01	1.52943E+02
2.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.40589E-01	1.88762E+02
2.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.40589E-01	2.24580E+02
3.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.22950E-01	2.83064E+01
3.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.22950E-01	5.47611E+01
3.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.22950E-01	8.12158E+01
3.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.22950E-01	1.07670E+02
3.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.22950E-01	1.34125E+02
3.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.22950E-01	1.60579E+02
3.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.22950E-01	1.87034E+02
3.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.53387E-01	1.88958E+01
3.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.53387E-01	4.70984E+01

U	TO	TW	DW	P	Q1
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.53387E-01	7.53011E+01
3.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.53387E-01	1.03503E+02
3.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.53387E-01	1.31706E+02
3.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.53387E-01	1.59909E+02
3.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.53387E-01	1.88111E+02
3.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.83824E-01	8.05909E-00
3.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.83824E-01	3.79076E+01
3.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.83824E-01	6.77561E+01
3.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.83824E-01	9.76046E+01
3.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.83824E-01	1.27453E+02
3.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.83824E-01	1.57301E+02
3.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.83824E-01	1.87150E+02
3.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.91100E-01	2.42627E+01
3.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.91100E-01	4.69381E+01
3.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.91100E-01	6.96135E+01
3.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.91100E-01	9.22889E+01
3.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.91100E-01	1.14964E+02
3.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.91100E-01	1.37639E+02
3.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.91100E-01	1.60315E+02
3.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.17189E-01	1.61964E+01
3.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.17189E-01	4.03701E+01
3.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.17189E-01	6.45438E+01
3.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.17189E-01	8.87176E+01
3.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.17189E-01	1.12891E+02
3.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.17189E-01	1.37065E+02
3.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.17189E-01	1.61238E+02
3.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.43278E-01	6.90779E-00
3.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.43278E-01	3.24922E+01
3.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.43278E-01	5.80766E+01
3.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.43278E-01	8.36611E+01
3.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.43278E-01	1.09245E+02
3.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.43278E-01	1.34830E+02
3.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.43278E-01	1.60414E+02
4.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.67213E-01	2.12298E+01
4.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.67213E-01	4.10708E+01
4.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.67213E-01	6.09118E+01
4.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.67213E-01	8.07528E+01
4.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.67213E-01	1.00593E+02
4.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.67213E-01	1.20434E+02
4.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.67213E-01	1.40275E+02
4.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.90040E-01	1.41718E+01
4.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.90040E-01	3.53238E+01
4.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.90040E-01	5.64758E+01
4.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.90040E-01	7.76279E+01
4.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.90040E-01	9.87799E+01
4.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.90040E-01	1.19931E+02
4.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.90040E-01	1.41083E+02
4.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.12868E-01	6.04432E-00
4.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.12868E-01	2.84307E+01
4.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.12868E-01	5.08171E+01
4.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.12868E-01	7.32035E+01
4.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.12868E-01	9.55899E+01
4.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.12868E-01	1.17976E+02
4.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.12868E-01	1.40362E+02
4.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.48633E-01	1.88709E+01
4.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.48633E-01	3.65074E+01
4.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.48633E-01	5.41438E+01
4.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.48633E-01	7.17803E+01
4.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.48633E-01	8.94167E+01

U	TO	TW	DW	P	Q1
4.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.48633E-01	1.07053E+02
4.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.48633E-01	1.24689E+02
4.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.68925E-01	1.25972E+01
4.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.68925E-01	3.13989E+01
4.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.68925E-01	5.02007E+01
4.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.68925E-01	6.90025E+01
4.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.68925E-01	8.78043E+01
4.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.68925E-01	1.06606E+02
4.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.68925E-01	1.25407E+02
4.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.89216E-01	5.37273E-00
4.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.89216E-01	2.52717E+01
4.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.89216E-01	4.51707E+01
4.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.89216E-01	6.50697E+01
4.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.89216E-01	8.49688E+01
4.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.89216E-01	1.04867E+02
4.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.89216E-01	1.24766E+02
5.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.33770E-01	1.69838E+01
5.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.33770E-01	3.28566E+01
5.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.33770E-01	4.87294E+01
5.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.33770E-01	6.46022E+01
5.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.33770E-01	8.04751E+01
5.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.33770E-01	9.63479E+01
5.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.33770E-01	1.12220E+02
5.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.52032E-01	1.13374E+01
5.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.52032E-01	2.82590E+01
5.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.52032E-01	4.51807E+01
5.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.52032E-01	6.21023E+01
5.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.52032E-01	7.90239E+01
5.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.52032E-01	9.59455E+01
5.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.52032E-01	1.12867E+02
5.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.70294E-01	4.83545E-00
5.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.70294E-01	2.27445E+01
5.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.70294E-01	4.06536E+01
5.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.70294E-01	5.85628E+01
5.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.70294E-01	7.64719E+01
5.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.70294E-01	9.43810E+01
5.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.70294E-01	1.12290E+02

Results for Argon

G O R
 1.66670E-00 6.63030E-26 1.73250E-10

U	TO	TW	DW	P	Q1
5.00000E-00	2.93000E+02	4.00000E+02	1.00000E-03	1.51625E-00	1.09270E+02
5.00000E-00	2.93000E+02	5.00000E+02	1.00000E-03	1.51625E-00	2.11392E+02
5.00000E-00	2.93000E+02	6.00000E+02	1.00000E-03	1.51625E-00	3.13513E+02
5.00000E-00	2.93000E+02	7.00000E+02	1.00000E-03	1.51625E-00	4.15635E+02
5.00000E-00	2.93000E+02	8.00000E+02	1.00000E-03	1.51625E-00	5.17757E+02
5.00000E-00	2.93000E+02	9.00000E+02	1.00000E-03	1.51625E-00	6.19879E+02
5.00000E-00	2.93000E+02	1.00000E+03	1.00000E-03	1.51625E-00	7.22000E+02
5.00000E-00	3.33000E+02	4.00000E+02	1.00000E-03	1.72324E-00	7.29426E+01
5.00000E-00	3.33000E+02	5.00000E+02	1.00000E-03	1.72324E-00	1.81812E+02
5.00000E-00	3.33000E+02	6.00000E+02	1.00000E-03	1.72324E-00	2.90681E+02
5.00000E-00	3.33000E+02	7.00000E+02	1.00000E-03	1.72324E-00	3.99551E+02
5.00000E-00	3.33000E+02	8.00000E+02	1.00000E-03	1.72324E-00	5.08420E+02
5.00000E-00	3.33000E+02	9.00000E+02	1.00000E-03	1.72324E-00	6.17290E+02
5.00000E-00	3.33000E+02	1.00000E+03	1.00000E-03	1.72324E-00	7.26160E+02
5.00000E-00	3.73000E+02	4.00000E+02	1.00000E-03	1.93024E-00	3.11101E+01
5.00000E-00	3.73000E+02	5.00000E+02	1.00000E-03	1.93024E-00	1.46333E+02
5.00000E-00	3.73000E+02	6.00000E+02	1.00000E-03	1.93024E-00	2.61556E+02
5.00000E-00	3.73000E+02	7.00000E+02	1.00000E-03	1.93024E-00	3.76778E+02
5.00000E-00	3.73000E+02	8.00000E+02	1.00000E-03	1.93024E-00	4.92001E+02
5.00000E-00	3.73000E+02	9.00000E+02	1.00000E-03	1.93024E-00	6.07224E+02
5.00000E-00	3.73000E+02	1.00000E+03	1.00000E-03	1.93024E-00	7.22447E+02
1.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	7.58125E-01	5.46351E+01
1.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	7.58125E-01	1.05696E+02
1.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	7.58125E-01	1.56756E+02
1.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	7.58125E-01	2.07817E+02
1.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	7.58125E-01	2.58878E+02
1.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	7.58125E-01	3.09939E+02
1.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	7.58125E-01	3.61000E+02
1.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	8.61623E-01	3.64713E+01
1.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	8.61623E-01	9.09060E+01
1.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	8.61623E-01	1.45340E+02
1.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	8.61623E-01	1.99775E+02
1.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	8.61623E-01	2.54210E+02
1.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	8.61623E-01	3.08645E+02
1.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	8.61623E-01	3.63080E+02
1.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	9.65121E-01	1.55550E+01
1.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	9.65121E-01	7.31665E+01
1.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	9.65121E-01	1.30778E+02
1.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	9.65121E-01	1.88389E+02
1.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	9.65121E-01	2.46000E+02
1.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	9.65121E-01	3.03612E+02
1.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	9.65121E-01	3.61223E+02
1.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	5.05416E-01	3.64234E+01
1.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	5.05416E-01	7.04640E+01
1.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	5.05416E-01	1.04504E+02
1.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	5.05416E-01	1.38545E+02
1.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	5.05416E-01	1.72585E+02
1.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	5.05416E-01	2.06626E+02
1.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	5.05416E-01	2.40666E+02
1.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	5.74415E-01	2.43142E+01
1.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	5.74415E-01	6.06040E+01
1.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	5.74415E-01	9.68939E+01
1.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	5.74415E-01	1.33183E+02
1.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	5.74415E-01	1.69473E+02
1.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	5.74415E-01	2.05763E+02

U	TO	TW	DW	P	Q1
1.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	5.74415E-01	2.42053E+02
1.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	6.43414E-01	1.03700E+01
1.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	6.43414E-01	4.87776E+01
1.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	6.43414E-01	8.71853E+01
1.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	6.43414E-01	1.25592E+02
1.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	6.43414E-01	1.64000E+02
1.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	6.43414E-01	2.02408E+02
1.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	6.43414E-01	2.40815E+02
2.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.79062E-01	2.73175E+01
2.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.79062E-01	5.28480E+01
2.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.79062E-01	7.83784E+01
2.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.79062E-01	1.03908E+02
2.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.79062E-01	1.29439E+02
2.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.79062E-01	1.54969E+02
2.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.79062E-01	1.80500E+02
2.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	4.30811E-01	1.82356E+01
2.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	4.30811E-01	4.54530E+01
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	4.30811E-01	7.26704E+01
2.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	4.30811E-01	9.98878E+01
2.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	4.30811E-01	1.27105E+02
2.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	4.30811E-01	1.54322E+02
2.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	4.30811E-01	1.81540E+02
2.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.82560E-01	7.77753E-00
2.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.82560E-01	3.65832E+01
2.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.82560E-01	6.53890E+01
2.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.82560E-01	9.41947E+01
2.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.82560E-01	1.23000E+02
2.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.82560E-01	1.51806E+02
2.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.82560E-01	1.80611E+02
2.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.03250E-01	2.18540E+01
2.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.03250E-01	4.22784E+01
2.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.03250E-01	6.27027E+01
2.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.03250E-01	8.31271E+01
2.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.03250E-01	1.03551E+02
2.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.03250E-01	1.23975E+02
2.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.03250E-01	1.44400E+02
2.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.44649E-01	1.45885E+01
2.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.44649E-01	3.63624E+01
2.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.44649E-01	5.81363E+01
2.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.44649E-01	7.99102E+01
2.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.44649E-01	1.01684E+02
2.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.44649E-01	1.23458E+02
2.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.44649E-01	1.45232E+02
2.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.86048E-01	6.22203E-00
2.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.86048E-01	2.92666E+01
2.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.86048E-01	5.23112E+01
2.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.86048E-01	7.53557E+01
2.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.86048E-01	9.84003E+01
2.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.86048E-01	1.21444E+02
2.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.86048E-01	1.44489E+02
3.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.52708E-01	1.82117E+01
3.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.52708E-01	3.52320E+01
3.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.52708E-01	5.22523E+01
3.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.52708E-01	6.92725E+01
3.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.52708E-01	8.62928E+01
3.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.52708E-01	1.03313E+02
3.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.52708E-01	1.20333E+02
3.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.87207E-01	1.21571E+01
3.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.87207E-01	3.03020E+01

U	TO	TW	DW	P	Q1
3.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.87207E-01	4.84469E+01
3.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.87207E-01	6.65918E+01
3.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.87207E-01	8.47368E+01
3.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.87207E-01	1.02881E+02
3.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.87207E-01	1.21026E+02
3.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.21707E-01	5.18502E+00
3.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.21707E-01	2.43888E+01
3.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.21707E-01	4.35926E+01
3.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.21707E-01	6.27964E+01
3.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.21707E-01	8.20003E+01
3.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.21707E-01	1.01204E+02
3.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.21707E-01	1.20407E+02
3.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.16607E-01	1.56100E+01
3.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.16607E-01	3.01988E+01
3.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.16607E-01	4.47876E+01
3.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.16607E-01	5.93765E+01
3.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.16607E-01	7.39653E+01
3.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.16607E-01	8.85541E+01
3.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.16607E-01	1.03142E+02
3.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.46178E-01	1.04203E+01
3.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.46178E-01	2.59731E+01
3.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.46178E-01	4.15259E+01
3.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.46178E-01	5.70787E+01
3.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.46178E-01	7.26315E+01
3.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.46178E-01	8.81843E+01
3.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.46178E-01	1.03737E+02
3.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.75749E-01	4.44430E+00
3.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.75749E-01	2.09047E+01
3.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.75749E-01	3.73651E+01
3.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.75749E-01	5.38255E+01
3.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.75749E-01	7.02859E+01
3.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.75749E-01	8.67464E+01
3.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.75749E-01	1.03206E+02
4.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.89531E-01	1.36587E+01
4.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.89531E-01	2.64240E+01
4.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.89531E-01	3.91892E+01
4.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.89531E-01	5.19544E+01
4.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.89531E-01	6.47196E+01
4.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.89531E-01	7.74848E+01
4.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.89531E-01	9.02501E+01
4.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.15405E-01	9.11782E+00
4.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.15405E-01	2.27265E+01
4.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.15405E-01	3.63352E+01
4.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.15405E-01	4.99439E+01
4.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.15405E-01	6.35526E+01
4.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.15405E-01	7.71613E+01
4.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.15405E-01	9.07700E+01
4.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.41280E-01	3.88876E+00
4.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.41280E-01	1.82916E+01
4.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.41280E-01	3.26945E+01
4.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.41280E-01	4.70973E+01
4.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.41280E-01	6.15002E+01
4.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.41280E-01	7.59031E+01
4.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.41280E-01	9.03059E+01
4.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.68472E-01	1.21411E+01
4.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.68472E-01	2.34880E+01
4.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.68472E-01	3.48348E+01
4.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.68472E-01	4.61817E+01
4.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.68472E-01	5.75285E+01

U	TO	TW	DW	P	Q1
4.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.68472E-01	6.88754E+01
4.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.68472E-01	8.02223E+01
4.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.91471E-01	8.10473E-00
4.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.91471E-01	2.02013E+01
4.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.91471E-01	3.22979E+01
4.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.91471E-01	4.43945E+01
4.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.91471E-01	5.64912E+01
4.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.91471E-01	6.85878E+01
4.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.91471E-01	8.06844E+01
4.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.14471E-01	3.45668E-00
4.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.14471E-01	1.62592E+01
4.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.14471E-01	2.90617E+01
4.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.14471E-01	4.18643E+01
4.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.14471E-01	5.46668E+01
4.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.14471E-01	6.74694E+01
4.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.14471E-01	8.02719E+01
5.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.51625E-01	1.09270E+01
5.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.51625E-01	2.11392E+01
5.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.51625E-01	3.13513E+01
5.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.51625E-01	4.15635E+01
5.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.51625E-01	5.17757E+01
5.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.51625E-01	6.19879E+01
5.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.51625E-01	7.22000E+01
5.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.72324E-01	7.29426E-00
5.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.72324E-01	1.81812E+01
5.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.72324E-01	2.90681E+01
5.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.72324E-01	3.99551E+01
5.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.72324E-01	5.08420E+01
5.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.72324E-01	6.17290E+01
5.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.72324E-01	7.26160E+01
5.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.93024E-01	3.11101E-00
5.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.93024E-01	1.46333E+01
5.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.93024E-01	2.61556E+01
5.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.93024E-01	3.76778E+01
5.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.93024E-01	4.92001E+01
5.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.93024E-01	6.07224E+01
5.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.93024E-01	7.22447E+01

Results for Helium

G O R
1.66670E-00 6.64390E-27 1.28800E-10

U	TO	TW	DW	P	Q1
5.00000E-00	2.93000E+02	4.00000E+02	1.00000E-03	2.74337E-00	6.24556E+02
5.00000E-00	2.93000E+02	5.00000E+02	1.00000E-03	2.74337E-00	1.20825E+03
5.00000E-00	2.93000E+02	6.00000E+02	1.00000E-03	2.74337E-00	1.79195E+03
5.00000E-00	2.93000E+02	7.00000E+02	1.00000E-03	2.74337E-00	2.37565E+03
5.00000E-00	2.93000E+02	8.00000E+02	1.00000E-03	2.74337E-00	2.95934E+03
5.00000E-00	2.93000E+02	9.00000E+02	1.00000E-03	2.74337E-00	3.54304E+03
5.00000E-00	2.93000E+02	1.00000E+03	1.00000E-03	2.74337E-00	4.12674E+03
5.00000E-00	3.33000E+02	4.00000E+02	1.00000E-03	3.11790E-00	4.16918E+02
5.00000E-00	3.33000E+02	5.00000E+02	1.00000E-03	3.11790E-00	1.03918E+03
5.00000E-00	3.33000E+02	6.00000E+02	1.00000E-03	3.11790E-00	1.66145E+03
5.00000E-00	3.33000E+02	7.00000E+02	1.00000E-03	3.11790E-00	2.28371E+03
5.00000E-00	3.33000E+02	8.00000E+02	1.00000E-03	3.11790E-00	2.90598E+03
5.00000E-00	3.33000E+02	9.00000E+02	1.00000E-03	3.11790E-00	3.52825E+03
5.00000E-00	3.33000E+02	1.00000E+03	1.00000E-03	3.11790E-00	4.15051E+03
5.00000E-00	3.73000E+02	4.00000E+02	1.00000E-03	3.49242E-00	1.77816E+02
5.00000E-00	3.73000E+02	5.00000E+02	1.00000E-03	3.49242E-00	8.36396E+02
5.00000E-00	3.73000E+02	6.00000E+02	1.00000E-03	3.49242E-00	1.49497E+03
5.00000E-00	3.73000E+02	7.00000E+02	1.00000E-03	3.49242E-00	2.15355E+03
5.00000E-00	3.73000E+02	8.00000E+02	1.00000E-03	3.49242E-00	2.81213E+03
5.00000E-00	3.73000E+02	9.00000E+02	1.00000E-03	3.49242E-00	3.47071E+03
5.00000E-00	3.73000E+02	1.00000E+03	1.00000E-03	3.49242E-00	4.12929E+03
1.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.37168E-00	3.12278E+02
1.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.37168E-00	6.04127E+02
1.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.37168E-00	8.95976E+02
1.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.37168E-00	1.18782E+03
1.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.37168E-00	1.47967E+03
1.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.37168E-00	1.77152E+03
1.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.37168E-00	2.06337E+03
1.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.55895E-00	2.08459E+02
1.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.55895E-00	5.19592E+02
1.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.55895E-00	8.30725E+02
1.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.55895E-00	1.14185E+03
1.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.55895E-00	1.45299E+03
1.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.55895E-00	1.76412E+03
1.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.55895E-00	2.07525E+03
1.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.74621E-00	8.89082E+01
1.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.74621E-00	4.18198E+02
1.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.74621E-00	7.47488E+02
1.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.74621E-00	1.07677E+03
1.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.74621E-00	1.40606E+03
1.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.74621E-00	1.73535E+03
1.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.74621E-00	2.06464E+03
1.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	9.14459E-01	2.08185E+02
1.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	9.14459E-01	4.02751E+02
1.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	9.14459E-01	5.97317E+02
1.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	9.14459E-01	7.91883E+02
1.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	9.14459E-01	9.86449E+02
1.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	9.14459E-01	1.18101E+03
1.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	9.14459E-01	1.37558E+03
1.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.03930E-00	1.38972E+02
1.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.03930E-00	3.46394E+02
1.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.03930E-00	5.53817E+02
1.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.03930E-00	7.61239E+02
1.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.03930E-00	9.68661E+02
1.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.03930E-00	1.17608E+03

U	TO	TW	DW	P	Q1
1.500000E+01	3.330000E+02	1.000000E+03	1.000000E-03	1.03930E-00	1.38350E+03
1.500000E+01	3.730000E+02	4.000000E+02	1.000000E-03	1.16414E-00	5.92721E+01
1.500000E+01	3.730000E+02	5.000000E+02	1.000000E-03	1.16414E-00	2.78798E+02
1.500000E+01	3.730000E+02	6.000000E+02	1.000000E-03	1.16414E-00	4.98325E+02
1.500000E+01	3.730000E+02	7.000000E+02	1.000000E-03	1.16414E-00	7.17852E+02
1.500000E+01	3.730000E+02	8.000000E+02	1.000000E-03	1.16414E-00	9.37379E+02
1.500000E+01	3.730000E+02	9.000000E+02	1.000000E-03	1.16414E-00	1.15690E+03
1.500000E+01	3.730000E+02	1.000000E+03	1.000000E-03	1.16414E-00	1.37643E+03
2.000000E+01	2.930000E+02	4.000000E+02	1.000000E-03	6.85844E-01	1.56139E+02
2.000000E+01	2.930000E+02	5.000000E+02	1.000000E-03	6.85844E-01	3.02063E+02
2.000000E+01	2.930000E+02	6.000000E+02	1.000000E-03	6.85844E-01	4.47988E+02
2.000000E+01	2.930000E+02	7.000000E+02	1.000000E-03	6.85844E-01	5.93912E+02
2.000000E+01	2.930000E+02	8.000000E+02	1.000000E-03	6.85844E-01	7.39837E+02
2.000000E+01	2.930000E+02	9.000000E+02	1.000000E-03	6.85844E-01	8.85761E+02
2.000000E+01	2.930000E+02	1.000000E+03	1.000000E-03	6.85844E-01	1.03168E+03
2.000000E+01	3.330000E+02	4.000000E+02	1.000000E-03	7.79475E-01	1.04229E+02
2.000000E+01	3.330000E+02	5.000000E+02	1.000000E-03	7.79475E-01	2.59796E+02
2.000000E+01	3.330000E+02	6.000000E+02	1.000000E-03	7.79475E-01	4.15362E+02
2.000000E+01	3.330000E+02	7.000000E+02	1.000000E-03	7.79475E-01	5.70929E+02
2.000000E+01	3.330000E+02	8.000000E+02	1.000000E-03	7.79475E-01	7.26496E+02
2.000000E+01	3.330000E+02	9.000000E+02	1.000000E-03	7.79475E-01	8.82062E+02
2.000000E+01	3.330000E+02	1.000000E+03	1.000000E-03	7.79475E-01	1.03762E+03
2.000000E+01	3.730000E+02	4.000000E+02	1.000000E-03	8.73105E-01	4.44541E+01
2.000000E+01	3.730000E+02	5.000000E+02	1.000000E-03	8.73105E-01	2.09099E+02
2.000000E+01	3.730000E+02	6.000000E+02	1.000000E-03	8.73105E-01	3.73744E+02
2.000000E+01	3.730000E+02	7.000000E+02	1.000000E-03	8.73105E-01	5.38389E+02
2.000000E+01	3.730000E+02	8.000000E+02	1.000000E-03	8.73105E-01	7.03034E+02
2.000000E+01	3.730000E+02	9.000000E+02	1.000000E-03	8.73105E-01	8.67679E+02
2.000000E+01	3.730000E+02	1.000000E+03	1.000000E-03	8.73105E-01	1.03232E+03
2.500000E+01	2.930000E+02	4.000000E+02	1.000000E-03	5.48675E-01	1.24911E+02
2.500000E+01	2.930000E+02	5.000000E+02	1.000000E-03	5.48675E-01	2.41650E+02
2.500000E+01	2.930000E+02	6.000000E+02	1.000000E-03	5.48675E-01	3.58390E+02
2.500000E+01	2.930000E+02	7.000000E+02	1.000000E-03	5.48675E-01	4.75130E+02
2.500000E+01	2.930000E+02	8.000000E+02	1.000000E-03	5.48675E-01	5.91869E+02
2.500000E+01	2.930000E+02	9.000000E+02	1.000000E-03	5.48675E-01	7.08609E+02
2.500000E+01	2.930000E+02	1.000000E+03	1.000000E-03	5.48675E-01	8.25348E+02
2.500000E+01	3.330000E+02	4.000000E+02	1.000000E-03	6.23580E-01	8.33836E+01
2.500000E+01	3.330000E+02	5.000000E+02	1.000000E-03	6.23580E-01	2.07836E+02
2.500000E+01	3.330000E+02	6.000000E+02	1.000000E-03	6.23580E-01	3.32290E+02
2.500000E+01	3.330000E+02	7.000000E+02	1.000000E-03	6.23580E-01	4.56743E+02
2.500000E+01	3.330000E+02	8.000000E+02	1.000000E-03	6.23580E-01	5.81196E+02
2.500000E+01	3.330000E+02	9.000000E+02	1.000000E-03	6.23580E-01	7.05650E+02
2.500000E+01	3.330000E+02	1.000000E+03	1.000000E-03	6.23580E-01	8.30103E+02
2.500000E+01	3.730000E+02	4.000000E+02	1.000000E-03	6.98484E-01	3.55632E+01
2.500000E+01	3.730000E+02	5.000000E+02	1.000000E-03	6.98484E-01	1.67279E+02
2.500000E+01	3.730000E+02	6.000000E+02	1.000000E-03	6.98484E-01	2.98995E+02
2.500000E+01	3.730000E+02	7.000000E+02	1.000000E-03	6.98484E-01	4.30711E+02
2.500000E+01	3.730000E+02	8.000000E+02	1.000000E-03	6.98484E-01	5.62427E+02
2.500000E+01	3.730000E+02	9.000000E+02	1.000000E-03	6.98484E-01	6.94143E+02
2.500000E+01	3.730000E+02	1.000000E+03	1.000000E-03	6.98484E-01	8.25859E+02
3.000000E+01	2.930000E+02	4.000000E+02	1.000000E-03	4.57229E-01	1.04092E+02
3.000000E+01	2.930000E+02	5.000000E+02	1.000000E-03	4.57229E-01	2.01375E+02
3.000000E+01	2.930000E+02	6.000000E+02	1.000000E-03	4.57229E-01	2.98658E+02
3.000000E+01	2.930000E+02	7.000000E+02	1.000000E-03	4.57229E-01	3.95941E+02
3.000000E+01	2.930000E+02	8.000000E+02	1.000000E-03	4.57229E-01	4.93224E+02
3.000000E+01	2.930000E+02	9.000000E+02	1.000000E-03	4.57229E-01	5.90507E+02
3.000000E+01	2.930000E+02	1.000000E+03	1.000000E-03	4.57229E-01	6.87790E+02
3.000000E+01	3.330000E+02	4.000000E+02	1.000000E-03	5.19650E-01	6.94864E+01
3.000000E+01	3.330000E+02	5.000000E+02	1.000000E-03	5.19650E-01	1.73197E+02

U	TO	TW	W	P	Q1
3.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	5.19650E-01	2.76908E+02
3.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	5.19650E-01	3.80619E+02
3.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	5.19650E-01	4.84330E+02
3.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	5.19650E-01	5.88041E+02
3.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	5.19650E-01	6.91752E+02
3.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	5.82070E-01	2.96360E+01
3.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	5.82070E-01	1.39399E+02
3.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	5.82070E-01	2.49162E+02
3.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	5.82070E-01	3.58926E+02
3.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	5.82070E-01	4.68689E+02
3.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	5.82070E-01	5.78453E+02
3.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	5.82070E-01	6.88216E+02
3.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.91911E-01	8.92223E+01
3.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.91911E-01	1.72607E+02
3.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.91911E-01	2.55993E+02
3.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.91911E-01	3.39378E+02
3.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.91911E-01	4.22764E+02
3.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.91911E-01	5.06149E+02
3.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.91911E-01	5.89534E+02
3.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	4.45414E-01	5.95597E+01
3.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	4.45414E-01	1.48454E+02
3.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	4.45414E-01	2.37350E+02
3.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	4.45414E-01	3.26245E+02
3.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	4.45414E-01	4.15140E+02
3.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	4.45414E-01	5.04035E+02
3.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	4.45414E-01	5.92931E+02
3.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.98917E-01	2.54023E+01
3.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.98917E-01	1.19485E+02
3.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.98917E-01	2.13568E+02
3.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.98917E-01	3.07651E+02
3.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.98917E-01	4.01733E+02
3.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.98917E-01	4.95816E+02
3.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.98917E-01	5.89899E+02
4.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.42922E-01	7.80695E+01
4.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.42922E-01	1.51031E+02
4.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.42922E-01	2.23994E+02
4.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.42922E-01	2.96956E+02
4.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.42922E-01	3.69918E+02
4.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.42922E-01	4.42880E+02
4.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.42922E-01	5.15842E+02
4.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.89737E-01	5.21148E+01
4.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.89737E-01	1.29898E+02
4.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.89737E-01	2.07681E+02
4.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.89737E-01	2.85464E+02
4.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.89737E-01	3.63248E+02
4.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.89737E-01	4.41031E+02
4.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.89737E-01	5.18814E+02
4.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.36552E-01	2.22270E+01
4.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.36552E-01	1.04549E+02
4.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.36552E-01	1.86872E+02
4.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.36552E-01	2.69194E+02
4.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.36552E-01	3.51517E+02
4.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.36552E-01	4.33839E+02
4.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.36552E-01	5.16162E+02
4.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.04819E-01	6.93951E+01
4.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.04819E-01	1.34250E+02
4.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.04819E-01	1.99105E+02
4.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.04819E-01	2.63961E+02
4.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.04819E-01	3.28816E+02

U	TO	TW	DW	P	Q1
4.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.04819E-01	3.93671E+02
4.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.04819E-01	4.58527E+02
4.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.46433E-01	4.63242E+01
4.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.46433E-01	1.15464E+02
4.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.46433E-01	1.84605E+02
4.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.46433E-01	2.53746E+02
4.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.46433E-01	3.22887E+02
4.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.46433E-01	3.92027E+02
4.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.46433E-01	4.61168E+02
4.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.88047E-01	1.97573E+01
4.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.88047E-01	9.29329E+01
4.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.88047E-01	1.66108E+02
4.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.88047E-01	2.39284E+02
4.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.88047E-01	3.12459E+02
4.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.88047E-01	3.85635E+02
4.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.88047E-01	4.58810E+02
5.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.74337E-01	6.24556E+01
5.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.74337E-01	1.20825E+02
5.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.74337E-01	1.79195E+02
5.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.74337E-01	2.37565E+02
5.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.74337E-01	2.95934E+02
5.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.74337E-01	3.54304E+02
5.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.74337E-01	4.12674E+02
5.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.11790E-01	4.16918E+01
5.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.11790E-01	1.03918E+02
5.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.11790E-01	1.66145E+02
5.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.11790E-01	2.28371E+02
5.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.11790E-01	2.90598E+02
5.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.11790E-01	3.52825E+02
5.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.11790E-01	4.15051E+02
5.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.49242E-01	1.77816E+01
5.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.49242E-01	8.36396E+01
5.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.49242E-01	1.49497E+02
5.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.49242E-01	2.15355E+02
5.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.49242E-01	2.81213E+02
5.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.49242E-01	3.47071E+02
5.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.49242E-01	4.12929E+02

Results for O₂

1.40000E-00 5.31110E-26 1.77050E-10

U	TO	TW	DW	P	Q1
5.00000E-00	2.93000E+02	4.00000E+02	1.00000E-03	1.45186E-00	1.75363E+02
5.00000E-00	2.93000E+02	5.00000E+02	1.00000E-03	1.45186E-00	3.39254E+02
5.00000E-00	2.93000E+02	6.00000E+02	1.00000E-03	1.45186E-00	5.03145E+02
5.00000E-00	2.93000E+02	7.00000E+02	1.00000E-03	1.45186E-00	6.67036E+02
5.00000E-00	2.93000E+02	8.00000E+02	1.00000E-03	1.45186E-00	8.30927E+02
5.00000E-00	2.93000E+02	9.00000E+02	1.00000E-03	1.45186E-00	9.94818E+02
5.00000E-00	2.93000E+02	1.00000E+03	1.00000E-03	1.45186E-00	1.15870E+03
5.00000E-00	3.33000E+02	4.00000E+02	1.00000E-03	1.65006E-00	1.17062E+02
5.00000E-00	3.33000E+02	5.00000E+02	1.00000E-03	1.65006E-00	2.91782E+02
5.00000E-00	3.33000E+02	6.00000E+02	1.00000E-03	1.65006E-00	4.66503E+02
5.00000E-00	3.33000E+02	7.00000E+02	1.00000E-03	1.65006E-00	6.41223E+02
5.00000E-00	3.33000E+02	8.00000E+02	1.00000E-03	1.65006E-00	8.15943E+02
5.00000E-00	3.33000E+02	9.00000E+02	1.00000E-03	1.65006E-00	9.90664E+02
5.00000E-00	3.33000E+02	1.00000E+03	1.00000E-03	1.65006E-00	1.16538E+03
5.00000E-00	3.73000E+02	4.00000E+02	1.00000E-03	1.84827E-00	4.99274E+01
5.00000E-00	3.73000E+02	5.00000E+02	1.00000E-03	1.84827E-00	2.34843E+02
5.00000E-00	3.73000E+02	6.00000E+02	1.00000E-03	1.84827E-00	4.19760E+02
5.00000E-00	3.73000E+02	7.00000E+02	1.00000E-03	1.84827E-00	6.04677E+02
5.00000E-00	3.73000E+02	8.00000E+02	1.00000E-03	1.84827E-00	7.89593E+02
5.00000E-00	3.73000E+02	9.00000E+02	1.00000E-03	1.84827E-00	9.74510E+02
5.00000E-00	3.73000E+02	1.00000E+03	1.00000E-03	1.84827E-00	1.15942E+03
1.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	7.25931E-01	8.76816E+01
1.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	7.25931E-01	1.69627E+02
1.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	7.25931E-01	2.51572E+02
1.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	7.25931E-01	3.33518E+02
1.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	7.25931E-01	4.15463E+02
1.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	7.25931E-01	4.97409E+02
1.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	7.25931E-01	5.79354E+02
1.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	8.25034E-01	5.85313E+01
1.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	8.25034E-01	1.45891E+02
1.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	8.25034E-01	2.33251E+02
1.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	8.25034E-01	3.20611E+02
1.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	8.25034E-01	4.07971E+02
1.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	8.25034E-01	4.95332E+02
1.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	8.25034E-01	5.82692E+02
1.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	9.24137E-01	2.49637E+01
1.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	9.24137E-01	1.17421E+02
1.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	9.24137E-01	2.09880E+02
1.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	9.24137E-01	3.02338E+02
1.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	9.24137E-01	3.94796E+02
1.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	9.24137E-01	4.87255E+02
1.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	9.24137E-01	5.79713E+02
1.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	4.83954E-01	5.84544E+01
1.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	4.83954E-01	1.13084E+02
1.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	4.83954E-01	1.67715E+02
1.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	4.83954E-01	2.22345E+02
1.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	4.83954E-01	2.76975E+02
1.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	4.83954E-01	3.31606E+02
1.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	4.83954E-01	3.86236E+02
1.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	5.50023E-01	3.90208E+01
1.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	5.50023E-01	9.72609E+01
1.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	5.50023E-01	1.55501E+02
1.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	5.50023E-01	2.13741E+02
1.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	5.50023E-01	2.71981E+02
1.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	5.50023E-01	3.30221E+02

U	TO	TW	DW	P	53 Q1
1.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	5.50023E-01	3.88461E+02
1.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	6.16091E-01	1.66424E+01
1.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	6.16091E-01	7.82813E+01
1.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	6.16091E-01	1.39920E+02
1.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	6.16091E-01	2.01559E+02
1.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	6.16091E-01	2.63197E+02
1.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	6.16091E-01	3.24836E+02
1.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	6.16091E-01	3.86475E+02
2.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.62965E-01	4.38408E+01
2.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.62965E-01	8.48136E+01
2.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.62965E-01	1.25786E+02
2.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.62965E-01	1.66759E+02
2.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.62965E-01	2.07731E+02
2.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.62965E-01	2.48704E+02
2.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.62965E-01	2.89677E+02
2.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	4.12517E-01	2.92656E+01
2.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	4.12517E-01	7.29457E+01
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	4.12517E-01	1.16625E+02
2.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	4.12517E-01	1.60305E+02
2.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	4.12517E-01	2.03985E+02
2.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	4.12517E-01	2.47666E+02
2.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	4.12517E-01	2.91346E+02
2.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.62068E-01	1.24818E+01
2.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.62068E-01	5.87109E+01
2.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.62068E-01	1.04940E+02
2.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.62068E-01	1.51169E+02
2.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.62068E-01	1.97398E+02
2.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.62068E-01	2.43627E+02
2.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.62068E-01	2.89856E+02
2.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.90372E-01	3.50726E+01
2.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.90372E-01	6.78508E+01
2.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.90372E-01	1.00629E+02
2.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.90372E-01	1.33407E+02
2.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.90372E-01	1.66185E+02
2.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.90372E-01	1.98963E+02
2.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.90372E-01	2.31741E+02
2.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.30013E-01	2.34125E+01
2.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.30013E-01	5.83565E+01
2.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.30013E-01	9.33006E+01
2.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.30013E-01	1.28244E+02
2.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.30013E-01	1.63188E+02
2.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.30013E-01	1.98132E+02
2.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.30013E-01	2.33076E+02
2.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.69655E-01	9.98548E+00
2.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.69655E-01	4.69687E+01
2.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.69655E-01	8.39520E+01
2.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.69655E-01	1.20935E+02
2.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.69655E-01	1.57918E+02
2.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.69655E-01	1.94902E+02
2.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.69655E-01	2.31885E+02
3.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.41977E-01	2.92272E+01
3.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.41977E-01	5.65424E+01
3.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.41977E-01	8.38575E+01
3.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.41977E-01	1.11172E+02
3.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.41977E-01	1.38487E+02
3.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.41977E-01	1.65803E+02
3.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.41977E-01	1.93118E+02
3.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.75011E-01	1.95104E+01
3.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.75011E-01	4.86304E+01

U	TO	TW	DW	P	Q1
3.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.75011E-01	7.77505E+01
3.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.75011E-01	1.06870E+02
3.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.75011E-01	1.35990E+02
3.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.75011E-01	1.65110E+02
3.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.75011E-01	1.94230E+02
3.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.08045E-01	8.32123E-00
3.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.08045E-01	3.91406E+01
3.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.08045E-01	6.99600E+01
3.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.08045E-01	1.00779E+02
3.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.08045E-01	1.31598E+02
3.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.08045E-01	1.62418E+02
3.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.08045E-01	1.93237E+02
3.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.07408E-01	2.50519E+01
3.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.07408E-01	4.84649E+01
3.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.07408E-01	7.18779E+01
3.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.07408E-01	9.52909E+01
3.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.07408E-01	1.18703E+02
3.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.07408E-01	1.42116E+02
3.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.07408E-01	1.65529E+02
3.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.35724E-01	1.67232E+01
3.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.35724E-01	4.16832E+01
3.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.35724E-01	6.66433E+01
3.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.35724E-01	9.16033E+01
3.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.35724E-01	1.16563E+02
3.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.35724E-01	1.41523E+02
3.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.35724E-01	1.66483E+02
3.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.64039E-01	7.13248E-00
3.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.64039E-01	3.35491E+01
3.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.64039E-01	5.99657E+01
3.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.64039E-01	8.63824E+01
3.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.64039E-01	1.12799E+02
3.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.64039E-01	1.39215E+02
3.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.64039E-01	1.65632E+02
4.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.81482E-01	2.19204E+01
4.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.81482E-01	4.24068E+01
4.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.81482E-01	6.28931E+01
4.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.81482E-01	8.33795E+01
4.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.81482E-01	1.03865E+02
4.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.81482E-01	1.24352E+02
4.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.81482E-01	1.44838E+02
4.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.06258E-01	1.46328E+01
4.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.06258E-01	3.64728E+01
4.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.06258E-01	5.83129E+01
4.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.06258E-01	8.01529E+01
4.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.06258E-01	1.01992E+02
4.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.06258E-01	1.23833E+02
4.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.06258E-01	1.45673E+02
4.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.31034E-01	6.24092E-00
4.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.31034E-01	2.93554E+01
4.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.31034E-01	5.24700E+01
4.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.31034E-01	7.55846E+01
4.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.31034E-01	9.86992E+01
4.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.31034E-01	1.21813E+02
4.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.31034E-01	1.44928E+02
4.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.61318E-01	1.94848E+01
4.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.61318E-01	3.76949E+01
4.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.61318E-01	5.59050E+01
4.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.61318E-01	7.41151E+01
4.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.61318E-01	9.23252E+01

U	TO	TW	DW	P	Q1
4.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.61318E-01	1.10535E+02
4.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.61318E-01	1.28745E+02
4.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.83341E-01	1.30069E+01
4.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.83341E-01	3.24203E+01
4.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.83341E-01	5.18336E+01
4.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.83341E-01	7.12470E+01
4.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.83341E-01	9.06604E+01
4.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.83341E-01	1.10073E+02
4.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.83341E-01	1.29487E+02
4.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.05363E-01	5.54749E-00
4.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.05363E-01	2.60937E+01
4.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.05363E-01	4.66400E+01
4.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.05363E-01	6.71863E+01
4.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.05363E-01	8.77326E+01
4.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.05363E-01	1.08278E+02
4.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.05363E-01	1.28825E+02
5.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.45186E-01	1.75363E+01
5.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.45186E-01	3.39254E+01
5.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.45186E-01	5.03145E+01
5.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.45186E-01	6.67036E+01
5.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.45186E-01	8.30927E+01
5.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.45186E-01	9.94818E+01
5.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.45186E-01	1.15870E+02
5.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.65006E-01	1.17062E+01
5.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.65006E-01	2.91782E+01
5.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.65006E-01	4.66503E+01
5.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.65006E-01	6.41223E+01
5.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.65006E-01	8.15943E+01
5.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.65006E-01	9.90664E+01
5.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.65006E-01	1.16538E+02
5.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.84827E-01	4.99274E-00
5.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.84827E-01	2.34843E+01
5.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.84827E-01	4.19760E+01
5.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.84827E-01	6.04677E+01
5.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.84827E-01	7.89593E+01
5.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.84827E-01	9.74510E+01
5.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.84827E-01	1.15942E+02

Results for N_2

G O R
1.40000E-00 4.64990E-26 1.87450E-10

U	TO	TW	DW	P	Q1
5.00000E-00	2.93000E+02	4.00000E+02	1.00000E-03	1.29522E-00	1.67197E+02
5.00000E-00	2.93000E+02	5.00000E+02	1.00000E-03	1.29522E-00	3.23457E+02
5.00000E-00	2.93000E+02	6.00000E+02	1.00000E-03	1.29522E+00	4.79716E+02
5.00000E-00	2.93000E+02	7.00000E+02	1.00000E-03	1.29522E-00	6.35975E+02
5.00000E-00	2.93000E+02	8.00000E+02	1.00000E-03	1.29522E-00	7.92235E+02
5.00000E-00	2.93000E+02	9.00000E+02	1.00000E-03	1.29522E-00	9.48494E+02
5.00000E-00	2.93000E+02	1.00000E+03	1.00000E-03	1.29522E-00	1.10475E+03
5.00000E-00	3.33000E+02	4.00000E+02	1.00000E-03	1.47205E-00	1.11611E+02
5.00000E-00	3.33000E+02	5.00000E+02	1.00000E-03	1.47205E-00	2.78196E+02
5.00000E-00	3.33000E+02	6.00000E+02	1.00000E-03	1.47205E-00	4.44780E+02
5.00000E-00	3.33000E+02	7.00000E+02	1.00000E-03	1.47205E-00	6.11364E+02
5.00000E-00	3.33000E+02	8.00000E+02	1.00000E-03	1.47205E-00	7.77949E+02
5.00000E-00	3.33000E+02	9.00000E+02	1.00000E-03	1.47205E-00	9.44533E+02
5.00000E-00	3.33000E+02	1.00000E+03	1.00000E-03	1.47205E-00	1.11111E+03
5.00000E-00	3.73000E+02	4.00000E+02	1.00000E-03	1.64887E-00	4.76025E+01
5.00000E-00	3.73000E+02	5.00000E+02	1.00000E-03	1.64887E-00	2.23908E+02
5.00000E-00	3.73000E+02	6.00000E+02	1.00000E-03	1.64887E-00	4.00214E+02
5.00000E-00	3.73000E+02	7.00000E+02	1.00000E-03	1.64887E-00	5.76520E+02
5.00000E-00	3.73000E+02	8.00000E+02	1.00000E-03	1.64887E-00	7.52826E+02
5.00000E-00	3.73000E+02	9.00000E+02	1.00000E-03	1.64887E-00	9.29132E+02
5.00000E-00	3.73000E+02	1.00000E+03	1.00000E-03	1.64887E-00	1.10543E+03
1.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	6.47614E-01	8.35987E+01
1.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	6.47614E-01	1.61728E+02
1.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	6.47614E-01	2.39858E+02
1.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	6.47614E-01	3.17987E+02
1.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	6.47614E-01	3.96117E+02
1.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	6.47614E-01	4.74247E+02
1.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	6.47614E-01	5.52377E+02
1.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	7.36025E-01	5.58057E+01
1.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	7.36025E-01	1.39098E+02
1.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	7.36025E-01	2.22390E+02
1.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	7.36025E-01	3.05682E+02
1.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	7.36025E-01	3.88974E+02
1.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	7.36025E-01	4.72266E+02
1.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	7.36025E-01	5.55559E+02
1.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	8.24437E-01	2.38012E+01
1.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	8.24437E-01	1.11954E+02
1.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	8.24437E-01	2.00107E+02
1.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	8.24437E-01	2.88260E+02
1.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	8.24437E-01	3.76413E+02
1.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	8.24437E-01	4.64566E+02
1.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	8.24437E-01	5.52718E+02
1.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	4.31742E-01	5.57325E+01
1.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	4.31742E-01	1.07819E+02
1.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	4.31742E-01	1.59905E+02
1.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	4.31742E-01	2.11991E+02
1.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	4.31742E-01	2.64078E+02
1.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	4.31742E-01	3.16164E+02
1.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	4.31742E-01	3.68251E+02
1.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	4.90683E-01	3.72038E+01
1.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	4.90683E-01	9.27320E+01
1.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	4.90683E-01	1.48260E+02
1.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	4.90683E-01	2.03788E+02
1.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	4.90683E-01	2.59316E+02
1.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	4.90683E-01	3.14844E+02

U	TO	TW	DW	P	Q1
1.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	4.90683E-01	3.70372E+02
1.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	5.49624E-01	1.58675E+01
1.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	5.49624E-01	7.46361E+01
1.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	5.49624E-01	1.33404E+02
1.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	5.49624E-01	1.92173E+02
1.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	5.49624E-01	2.50942E+02
1.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	5.49624E-01	3.09710E+02
1.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	5.49624E-01	3.68479E+02
2.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	3.23807E-01	4.17993E+01
2.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	3.23807E-01	8.08642E+01
2.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	3.23807E-01	1.19929E+02
2.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	3.23807E-01	1.58993E+02
2.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	3.23807E-01	1.98058E+02
2.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	3.23807E-01	2.37123E+02
2.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	3.23807E-01	2.76188E+02
2.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	3.68012E-01	2.79028E+01
2.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	3.68012E-01	6.95490E+01
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	3.68012E-01	1.11195E+02
2.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	3.68012E-01	1.52841E+02
2.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	3.68012E-01	1.94487E+02
2.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	3.68012E-01	2.36133E+02
2.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	3.68012E-01	2.77779E+02
2.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	4.12218E-01	1.19006E+01
2.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	4.12218E-01	5.59771E+01
2.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	4.12218E-01	1.00053E+02
2.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	4.12218E-01	1.44130E+02
2.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	4.12218E-01	1.88206E+02
2.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	4.12218E-01	2.32283E+02
2.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	4.12218E-01	2.76359E+02
2.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.59045E-01	3.34395E+01
2.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.59045E-01	6.46914E+01
2.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.59045E-01	9.59432E+01
2.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.59045E-01	1.27195E+02
2.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.59045E-01	1.58447E+02
2.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.59045E-01	1.89698E+02
2.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.59045E-01	2.20950E+02
2.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.94410E-01	2.23223E+01
2.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.94410E-01	5.56392E+01
2.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.94410E-01	8.89561E+01
2.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.94410E-01	1.22273E+02
2.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.94410E-01	1.55589E+02
2.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.94410E-01	1.88906E+02
2.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.94410E-01	2.22223E+02
2.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	3.29774E-01	9.52051E-00
2.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	3.29774E-01	4.47816E+01
2.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	3.29774E-01	8.00428E+01
2.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	3.29774E-01	1.15304E+02
2.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	3.29774E-01	1.50565E+02
2.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	3.29774E-01	1.85826E+02
2.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	3.29774E-01	2.21087E+02
3.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	2.15871E-01	2.78662E+01
3.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	2.15871E-01	5.39095E+01
3.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	2.15871E-01	7.99527E+01
3.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	2.15871E-01	1.05995E+02
3.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	2.15871E-01	1.32039E+02
3.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	2.15871E-01	1.58082E+02
3.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	2.15871E-01	1.84125E+02
3.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.45341E-01	1.86019E+01
3.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.45341E-01	4.63660E+01

U	TO	TW	DW	P	Q1
2.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.45341E-01	7.41300E+01
3.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.45341E-01	1.01894E+02
3.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.45341E-01	1.29658E+02
3.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.45341E-01	1.57422E+02
3.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.45341E-01	1.85186E+02
3.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.74812E-01	7.93375E+00
3.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.74812E-01	3.73180E+01
3.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.74812E-01	6.67023E+01
3.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.74812E-01	9.60867E+01
3.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.74812E-01	1.25471E+02
3.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.74812E-01	1.54855E+02
3.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.74812E-01	1.84239E+02
3.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.85032E-01	2.38853E+01
3.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.85032E-01	4.62081E+01
3.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.85032E-01	6.85309E+01
3.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.85032E-01	9.08536E+01
3.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.85032E-01	1.13176E+02
3.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.85032E-01	1.35499E+02
3.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.85032E-01	1.57822E+02
3.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	2.10293E-01	1.59445E+01
3.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	2.10293E-01	3.97422E+01
3.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	2.10293E-01	6.35400E+01
3.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	2.10293E-01	8.73378E+01
3.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	2.10293E-01	1.11135E+02
3.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	2.10293E-01	1.34933E+02
3.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	2.10293E-01	1.58731E+02
3.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.35553E-01	6.80036E+00
3.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.35553E-01	3.19869E+01
3.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.35553E-01	5.71734E+01
3.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.35553E-01	8.23600E+01
3.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.35553E-01	1.07546E+02
3.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.35553E-01	1.32733E+02
3.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.35553E-01	1.57919E+02
4.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.61903E-01	2.08996E+01
4.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.61903E-01	4.04321E+01
4.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.61903E-01	5.99645E+01
4.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.61903E-01	7.94969E+01
4.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.61903E-01	9.90294E+01
4.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.61903E-01	1.18561E+02
4.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.61903E-01	1.38094E+02
4.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.84006E-01	1.39514E+01
4.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.84006E-01	3.47745E+01
4.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.84006E-01	5.55975E+01
4.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.84006E-01	7.64206E+01
4.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.84006E-01	9.72436E+01
4.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.84006E-01	1.18066E+02
4.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.84006E-01	1.38889E+02
4.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	2.06109E-01	5.95031E+00
4.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	2.06109E-01	2.79885E+01
4.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	2.06109E-01	5.00267E+01
4.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	2.06109E-01	7.20650E+01
4.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	2.06109E-01	9.41032E+01
4.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	2.06109E-01	1.16141E+02
4.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	2.06109E-01	1.38179E+02
4.50000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.43914E-01	1.85775E+01
4.50000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.43914E-01	3.59396E+01
4.50000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.43914E-01	5.33018E+01
4.50000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.43914E-01	7.06639E+01
4.50000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.43914E-01	8.80261E+01

U	TO	TW	DW	P	Q1
4.50000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.43914E-01	1.05388E+02
4.50000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.43914E-01	1.22750E+02
4.50000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.63561E-01	1.24012E+01
4.50000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.63561E-01	3.09106E+01
4.50000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.63561E-01	4.94200E+01
4.50000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.63561E-01	6.79294E+01
4.50000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.63561E-01	8.64388E+01
4.50000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.63561E-01	1.04948E+02
4.50000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.63561E-01	1.23457E+02
4.50000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.83208E-01	5.28917E-00
4.50000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.83208E-01	2.48787E+01
4.50000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.83208E-01	4.44682E+01
4.50000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.83208E-01	6.40578E+01
4.50000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.83208E-01	8.36473E+01
4.50000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.83208E-01	1.03236E+02
4.50000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.83208E-01	1.22826E+02
5.00000E+01	2.93000E+02	4.00000E+02	1.00000E-03	1.29522E-01	1.67197E+01
5.00000E+01	2.93000E+02	5.00000E+02	1.00000E-03	1.29522E-01	3.23457E+01
5.00000E+01	2.93000E+02	6.00000E+02	1.00000E-03	1.29522E-01	4.79716E+01
5.00000E+01	2.93000E+02	7.00000E+02	1.00000E-03	1.29522E-01	6.35975E+01
5.00000E+01	2.93000E+02	8.00000E+02	1.00000E-03	1.29522E-01	7.92235E+01
5.00000E+01	2.93000E+02	9.00000E+02	1.00000E-03	1.29522E-01	9.48494E+01
5.00000E+01	2.93000E+02	1.00000E+03	1.00000E-03	1.29522E-01	1.10475E+02
5.00000E+01	3.33000E+02	4.00000E+02	1.00000E-03	1.47205E-01	1.11611E+01
5.00000E+01	3.33000E+02	5.00000E+02	1.00000E-03	1.47205E-01	2.78196E+01
5.00000E+01	3.33000E+02	6.00000E+02	1.00000E-03	1.47205E-01	4.44780E+01
5.00000E+01	3.33000E+02	7.00000E+02	1.00000E-03	1.47205E-01	6.11364E+01
5.00000E+01	3.33000E+02	8.00000E+02	1.00000E-03	1.47205E-01	7.77949E+01
5.00000E+01	3.33000E+02	9.00000E+02	1.00000E-03	1.47205E-01	9.44533E+01
5.00000E+01	3.33000E+02	1.00000E+03	1.00000E-03	1.47205E-01	1.11111E+02
5.00000E+01	3.73000E+02	4.00000E+02	1.00000E-03	1.64887E-01	4.76025E-00
5.00000E+01	3.73000E+02	5.00000E+02	1.00000E-03	1.64887E-01	2.23908E+01
5.00000E+01	3.73000E+02	6.00000E+02	1.00000E-03	1.64887E-01	4.00214E+01
5.00000E+01	3.73000E+02	7.00000E+02	1.00000E-03	1.64887E-01	5.76520E+01
5.00000E+01	3.73000E+02	8.00000E+02	1.00000E-03	1.64887E-01	7.52826E+01
5.00000E+01	3.73000E+02	9.00000E+02	1.00000E-03	1.64887E-01	9.29132E+01
5.00000E+01	3.73000E+02	1.00000E+03	1.00000E-03	1.64887E-01	1.10543E+02



Fig. 1 Maxwell-Boltzmann Speed Distribution Function

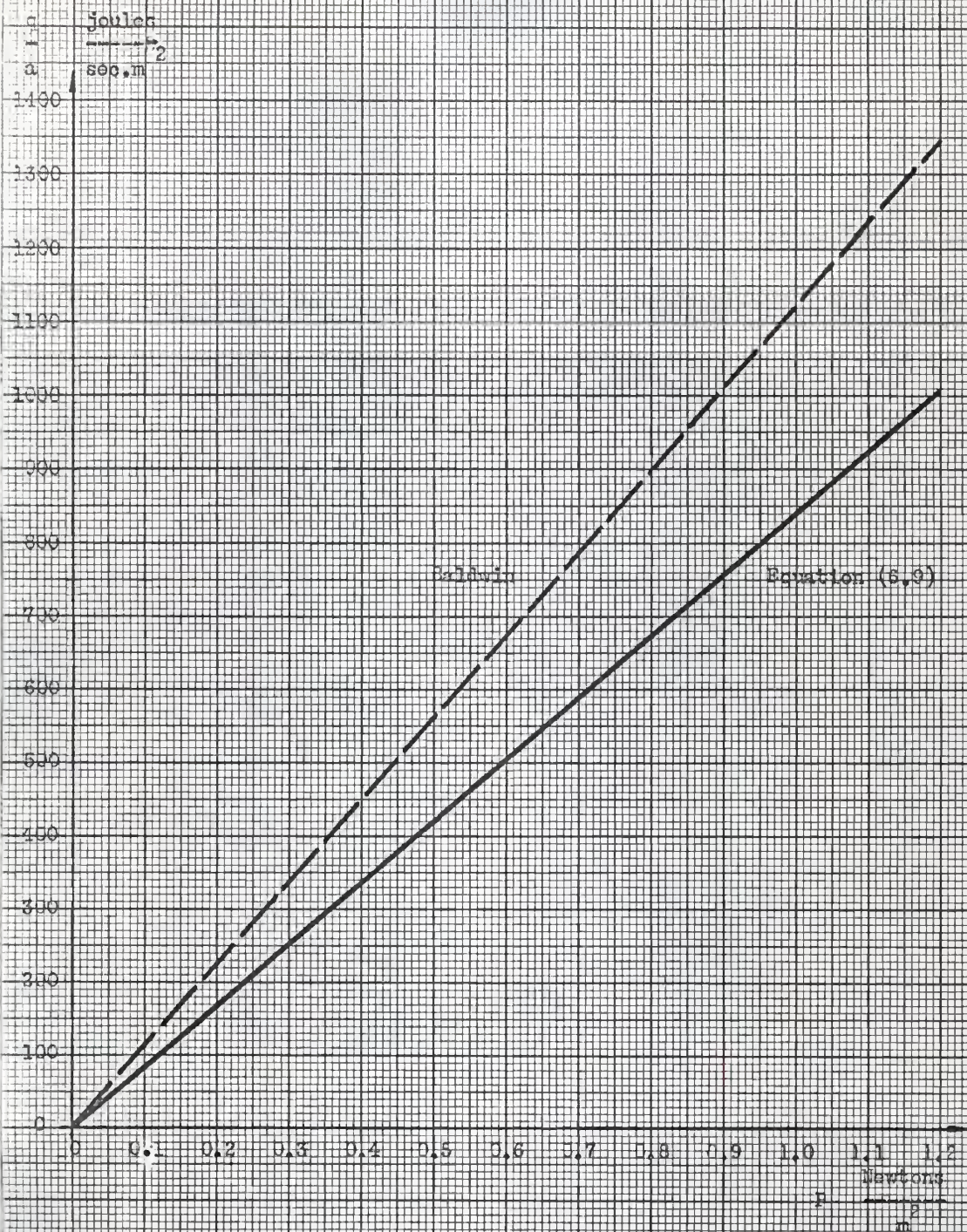


Fig. 2 Heat Transfer Rate per Unit Surface Area vs. Pressure
 for $\frac{W}{\rho} = 8.415$

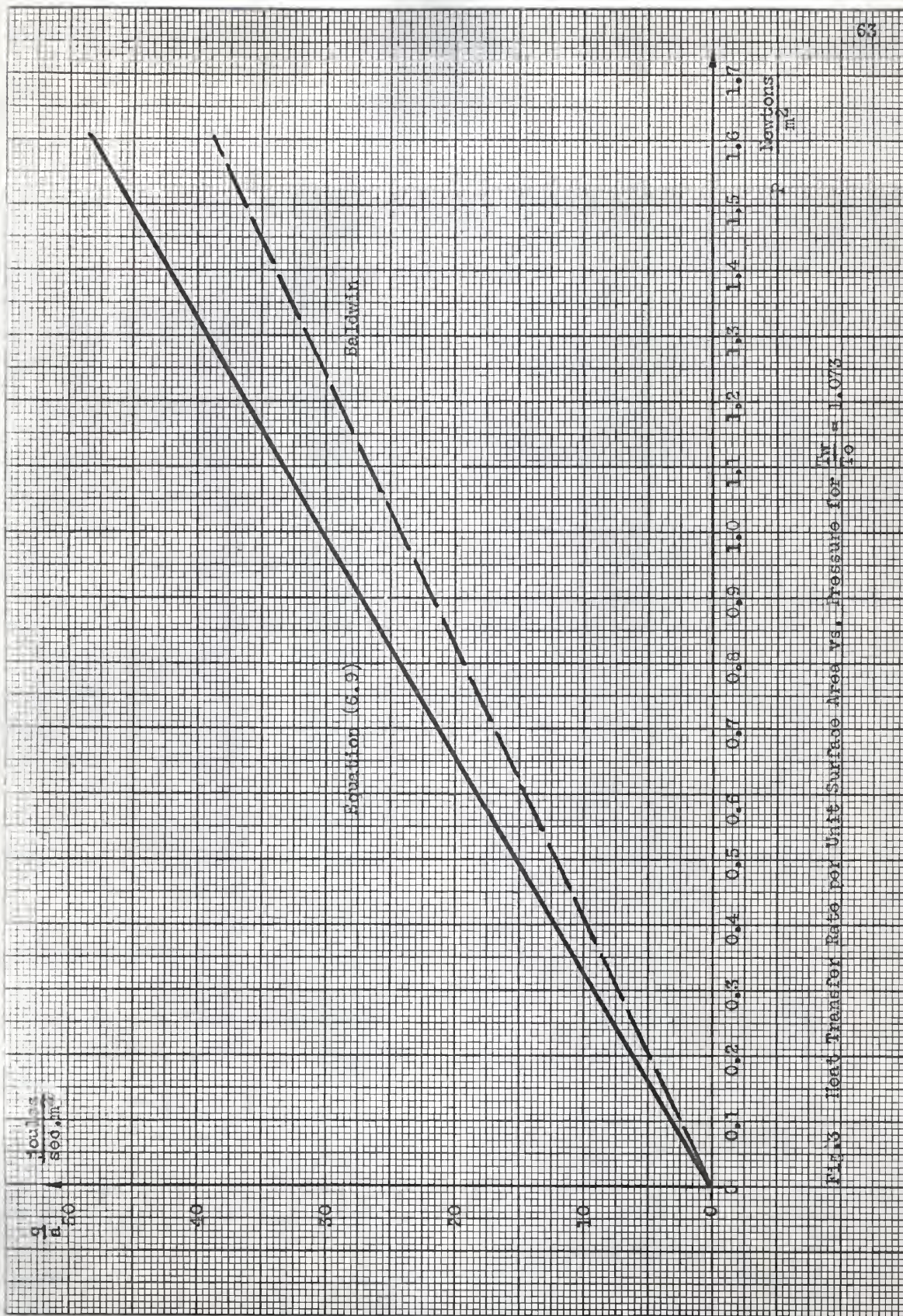


Fig. 3 Heat Transfer Rate per Unit Surface Area vs. Pressure for $\frac{Pr}{10} = 1.073$

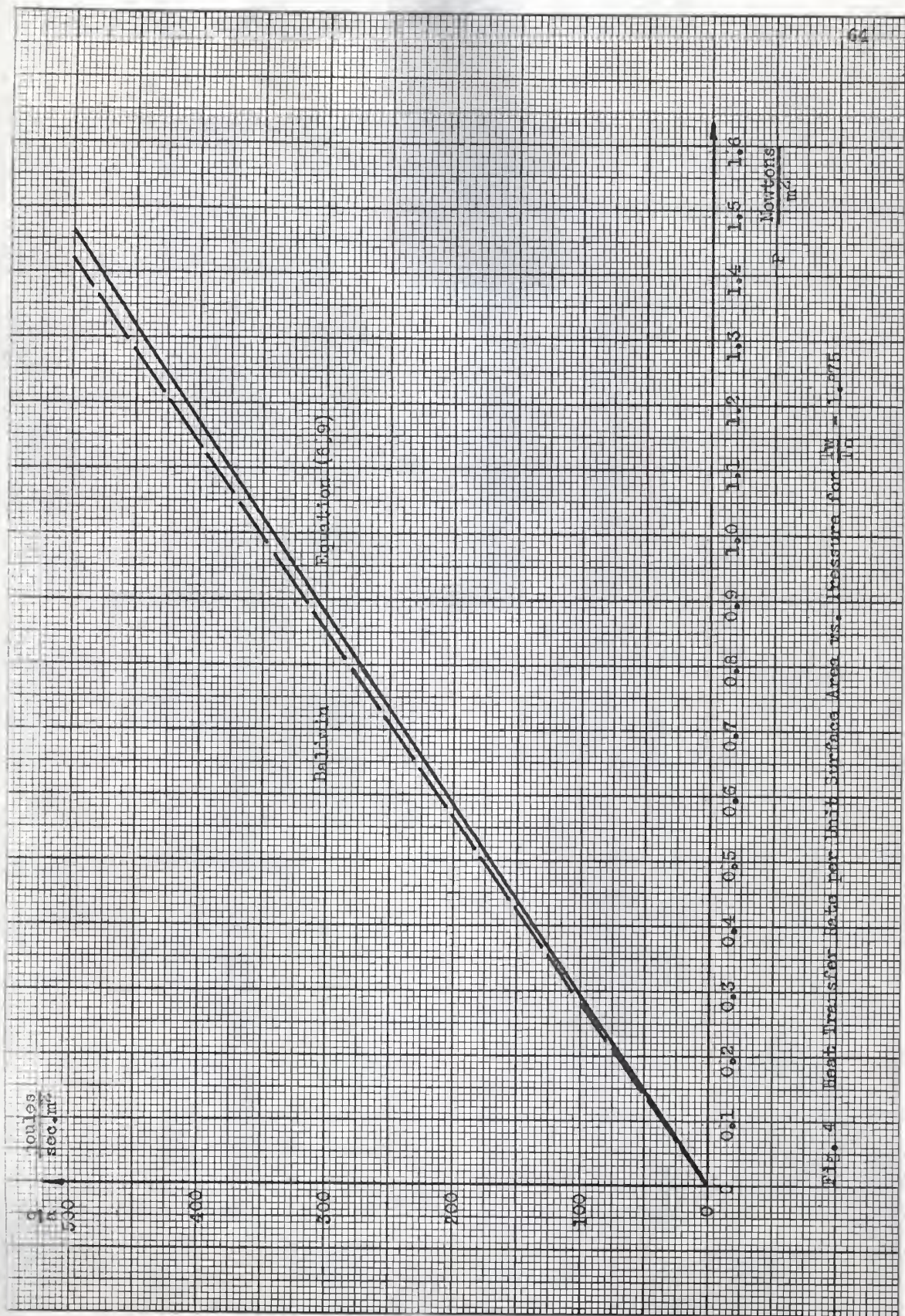


Fig. 4 Heat Transfer Rate per Unit Surface Area vs. Pressure for $M = 1.075$

CONVECTIVE HEAT TRANSFER FROM A HOT WIRE
TO A RAREFIED GAS BASED ON KINETIC THEORY

by

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B. S., Technical College of the State of
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The purpose of the study was to find an equation for the convective heat transfer in the free molecular regime from a hot wire to a gas at rest. In free molecule flow the characteristic dimension of a body immersed into a gas, the wire diameter in the case considered, is small compared to the mean free path of the molecules. This implies that there is no distinct temperature gradient and therefore the use of kinetic theory to calculate the convective heat transfer is necessary. Kinetic theory allows application of the laws of classical mechanics to the individual molecules of a system and treatment of the molecules statistically.

The convective heat transfer rate from a hot wire to a rarefied gas is then given by the average increase in energy of a molecule after collision with the wire multiplied by the number of impacts between molecules and wire per unit time. The assumption was made that the local heat transfer is the same over the entire wire which led to a relatively simple expression for the heat transfer rate.

With the help of an IBM 1620 computer, numerical values were obtained for different gases, different ratios of wire temperature to free stream temperature, and various Knudsen numbers. The values of the heat transfer rates obtained for air have been compared with the heat transfer rate from a wire to air at rest, published recently by L. V. Baldwin.

The comparison of the results of the two equations showed that, at a ratio of the wire temperature to the free stream temperature of approximately 1.9, the two equations yield nearly the same values for the heat transfer rates. At a higher

ratio, the equation developed by the author gives lower heat transfer rates than does Baldwin's equation, whereas at a temperature ratio lower than 1.9, Baldwin's equation yields lower heat transfer rates.