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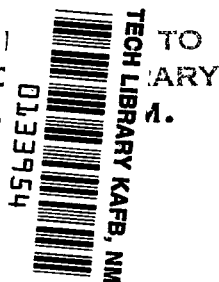
THERMODYNAMIC, TRANSPORT, AND FLOW PROPERTIES OF GASEOUS PRODUCTS RESULTING FROM COMBUSTION OF METHANE-AIR-OXYGEN MIXTURES

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16. Abstract

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THERMODYNAMIC, TRANSPORT, AND FLOW PROPERTIES
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SUMMARY

Results of calculations to determine thermodynamic, transport, and flow properties of combustion product gases are presented. The product gases are those resulting from combustion of methane-air-oxygen and methane-oxygen mixtures. The oxygen content of products resulting from the combustion of methane-air-oxygen mixtures was similar to that of air; however, the oxygen contained in products of methane-oxygen combustion ranged from 20 percent by volume to zero for stoichiometric combustion. Calculations were made for products of reactant mixtures with fuel percentages, by mass, of 7.5 to 20. Results are presented for specific mixtures for a range of pressures varying from 0.0001 to 1000 atm and for temperatures ranging from 200 to 3800 K.

INTRODUCTION

The determination of the equilibrium composition and the corresponding thermodynamic, transport, and flow properties for a gaseous chemical reaction is necessary for certain problems in thermodynamics. Typical examples of such problems are (1) the expansion of combustion gases through a nozzle to obtain thrust, as in the case of turbojet and ramjet engines, and (2) utilization of combustion gases as the test medium in ground facilities for simulating combined heating and loading in various flight regimes, such as hypersonic flight. The products resulting from the combustion of methane-air or methane-air-oxygen mixtures are often utilized as a test medium in these facilities.

Properties of the products resulting from combustion of methane-air mixtures were presented in reference 1. Addition of sufficient oxygen to the reactants to produce an oxygen content of the combustion products similar to that of air has also been considered and was included in the calculations represented by the charts and tables of reference 2. However, those calculations were limited to combustion reactants containing less than 6 percent fuel by mass. The resulting enthalpy of the combustion products, referenced to zero

at 0 K $(H - H_O)$, with ambient initial temperatures and adiabatic combustion, was less than 3.5 MJ/kg.

Simulation of local heating and pressure loads on vehicles such as the space shuttle requires greater energy in the test medium. One facility utilizing combustion products for such purposes is the Langley thermal protection system test facility (TPSTF). In this facility, methane-air-oxygen mixtures are burned at pressures ranging from 2 to 20 atm. With the reactants at ambient conditions and with adiabatic combustion, the enthalpy $(H - H_O)$ range of the combustion products is 2.3 to about 10.3 MJ/kg, with combustor temperatures ranging from about 2000 to 3400 K.

At those temperatures, the desired properties cannot be measured directly and, therefore, must be calculated. Hence, this report presents the results of a study to determine thermodynamic, transport, and flow properties of products resulting from the combustion of methane-air-oxygen and methane-oxygen mixtures with fuel percentages, by mass, of 7.5 to 20 (stoichiometric CH_4-O_2 combustion). Products from the methane-air-oxygen mixtures contained, by volume, 20 percent oxygen at the standard temperature and pressure. The oxygen content of products from methane-oxygen combustion ranged from 20 percent to zero for the stoichiometric case. The properties were calculated for a range of pressures varying from 0.0001 to 1000 atm and for a range of temperatures from 200 to 3800 K.

SYMBOLS

A	area, m^2
a	velocity of sound, m/s
c	mass fraction
c_p	specific heat at constant pressure, J/kg-K
H	enthalpy, J/kg
k	thermal conductivity, W/m-K
M	molecular weight
N_{Ma}	Mach number

N_{Pr} Prandtl number

p   pressure, atm (1 atm = 101.3 kPa)

q   dynamic pressure, Pa

s   entropy, J/kg-K

T   temperature, K

V   velocity, m/s

x   mole fraction

γ isentropic exponent $\left(\dfrac{\partial \ln p}{\partial \ln \rho}\right)_{S}$

μ viscosity, $N\text{-}s/m^2$

ρ mass density, kg/m^3

Subscripts:

e   equilibrium

f   frozen

i   ith chemical species

o   absolute zero temperature

p   products

t   total

1   conditions upstream of a shock wave

2   conditions downstream of normal shock wave

Superscript:

*   conditions at throat of nozzle

ANALYTICAL PROCEDURES

Thermodynamic and Transport Properties

Thermodynamic and transport properties of combustion products resulting from the reactants shown in figure 1 were determined through the use of a computer program (TRAN72) which is described in reference 3. That program is basically the computer program of reference 4 combined with subroutines for the calculation of transport properties.

Equilibrium chemical compositions are determined with minimization of free-energy techniques, and species thermodynamic data are derived primarily from the JANAF tables (ref. 5). Condensed, as well as gaseous, species are considered in thermodynamic calculations; however, only the major gaseous species (up to 20) with a mole fraction greater than 10^{-7} are included in the calculations of transport properties.

Transport property calculations are based on theories of references 6 and 7. A rather comprehensive list of transport data, taken from the literature, is included in the computer program. Empirical rules are utilized when data are not otherwise available.

The major assumptions for the equilibrium calculations were: (1) all gases are ideal, (2) there is complete mixing of the different species, (3) flow is one-dimensional and frictionless, and (4) expansions are isentropic. The calculations were made over a pressure range of 0.0001 to 1000 atm and for temperatures of 200 to 3800 K. These calculations were made over the pressure range at 20 K intervals in order that computer plots would result in smooth curves. The chemical species for equilibrium compositions and thermodynamic properties included all those having a mole fraction greater than 10^{-8}.

Flow Properties

Some useful ratios of inviscid flow properties of the combustion products during an isentropic expansion were also developed. This was accomplished by utilizing calculated thermodynamic properties as input data to the Aerotherm Chemical Equilibrium (ACE) computer program (refs. 8 and 9).[1] This program is based on assumptions similar to those previously listed for other equilibrium calculations, and species data are also derived from the JANAF tables. Results of similar calculations, such as equilibrium

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[1]The user's manual is available by request only from COSMIC with program LEW-11722.

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compositions and temperatures, obtained from the different computer programs are nearly equal, and the data combined to develop these ratios should be consistent.

RESULTS

Thermodynamic and Transport Properties

Equilibrium temperatures of product gases, resulting from adiabatic combustion of the reactants having an initial temperature of 298 K (fig. 1), are shown in figure 2 for several pressures. These results show that for product gases having an enthalpy $(H - H_0)$ greater than about 5 MJ/kg, temperature is a weak function of enthalpy because of dissociation of the combustion products.

Thermodynamic and transport properties were calculated for six combustion gas mixtures. For identification purposes, these are designated as product gas mixtures A to F. The reactants for the products are listed in table I.

The results of the calculations are presented in figures 3 to 8, which consist of pressure-enthalpy diagrams including lines of constant temperature and entropy, the variation of chemical composition with temperature for pressures of 0.01, 1.0, and 100 atm, and the following properties as a function of temperature for various pressures in the range considered: molecular weight, isentropic exponent, viscosity, equilibrium and frozen thermal conductivity, equilibrium and frozen specific heat at constant pressure, and Prandtl number.

It may be noted that real-gas effects due to high pressures have been neglected in the calculations. Hence, results presented for pressures greater than about 200 atm may contain some error. However, the data range above that pressure is limited. Also, the data indicate that viscosity is relatively insensitive to pressures greater than 50 atm and that variations of thermal conductivity and specific heat are similar at all pressures. Although absolute values may be in error at the higher pressures, errors will tend to cancel when ratios are taken for heat transfer parameters such as Prandtl number. Therefore, any remaining error will be much less than the errors in individually calculated properties.

Flow Properties

Ratios of free-stream properties of the combustion gases for isentropic expansions and ratios of free-stream properties behind a normal shock are presented in table II as functions of Mach number.

CONCLUDING REMARKS

Thermodynamic, transport, and flow properties for combustion products of methane-air-oxygen and methane-oxygen mixtures have been calculated. Products resulting from methane-air-oxygen mixtures contain 20 percent oxygen by volume at the standard pressure and temperature. The oxygen content of products of methane-oxygen mixtures ranged from 20 percent to zero for the stoichiometric case.

The properties were calculated for a pressure range of 0.0001 to 1000 atm and for temperatures ranging from 200 to 3800 K. Results are presented for specific combustion product mixtures for the range of calculations at intervals such that intermediate values may be readily obtained through interpolation.

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April 23, 1976

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TABLE I.- REACTANTS FOR CALCULATION OF
PROPERTIES OF COMBUSTION PRODUCTS

Mass fraction			Product gas mixture
Methane	Air	Oxygen	
0.075	0.519	0.406	A
.110	.291	.599	B
.131	.151	.718	C
.157	----	.843	D
.180	----	.820	E
.200	----	.800	F

TABLE II.- RATIOS OF ISENTROPICALLY EXPANDED AND NORMAL SHOCK PROPERTIES OF METHANE-AIR-OXYGEN COMBUSTION PRODUCTS

(a) Product mixture A

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
0.0000	1.0000 0	1.0000 0	1.00000	0.0000	0.000010	0.000						
.0248	9.9964-1	9.9969-1	.99995	.0248	.000356	24.000						
.0298	9.9948-1	9.9955-1	.99993	.0298	.000515	20.000						
.0341	9.9932-1	9.9942-1	.99991	.0341	.000674	17.500						
.0397	9.9908-1	9.9921-1	.99988	.0397	.000913	15.000						
.0477	9.9867-1	9.9886-1	.99983	.0477	.001322	12.500						
.0597	9.9793-1	9.9822-1	.99973	.0597	.002061	10.000						
.0797	9.9631-1	9.9683-1	.99952	.0797	.003681	7.500						
.1201	9.9165-1	9.9282-1	.99891	.1200	.008315	5.000						
.1337	9.8967-1	9.9111-1	.99865	.1335	.010282	4.500						
.1508	9.8688-1	9.8871-1	.99828	.1506	.013045	4.000						
.1730	9.8277-1	9.8517-1	.99774	.1728	.017100	3.500						
.2030	9.7635-1	9.7963-1	.99689	.2027	.023435	3.000						
.2461	9.6544-1	9.7023-1	.99543	.2456	.034031	2.500						
.2758	9.5684-1	9.6279-1	.99426	.2756	.042340	2.250						
.3140	9.4445-1	9.5207-1	.99256	.3128	.054190	2.000						
.3538	9.3005-1	9.3958-1	.99056	.3522	.067741	1.800						
.4067	9.0877-1	9.2110-1	.98755	.4042	.087519	1.600						
.4813	8.7462-1	8.9148-1	.98259	.4773	.118199	1.400						
.5328	8.4909-1	8.6894-1	.97871	.5273	.14652	1.300						
.5642	8.3254-1	8.5440-1	.97614	.5578	.154579	1.250						
.6012	8.1241-1	8.3666-1	.97296	.5933	.171286	1.200						
.6458	7.8717-1	8.1434-1	.96884	.6361	.191625	1.150						
.7025	7.5390-1	7.8476-1	.96321	.6901	.217324	1.100						
.7824	7.0529-1	7.4128-1	.95452	.7653	.252514	1.050						
.8428	6.6772-1	7.0741-1	.94738	.8216	.277677	1.025						
.9670	5.8932-1	6.3637-1	.93117	.9351	.323624	1.001						
1.0000	5.6923-1	6.1740-1	.92651	.9649	.334263	1.000						
1.0331	5.4874-1	5.9843-1	.92171	.9945	.344165	1.001	.9116	1.135	1.112	1.020	.997841	.549927
1.1058	5.0446-1	5.5712-1	.91069	1.0587	.363121	1.010	.9116	1.234	1.194	1.032	.997841	.505552
1.1505	4.7786-1	5.3208-1	.90358	1.0976	.372792	1.020	.8757	1.347	1.286	1.045	.995645	.479948
1.1851	4.5769-1	5.1298-1	.89792	1.1275	.379213	1.030	.8506	1.437	1.358	1.055	.992916	.460903
1.2145	4.4049-1	4.9698-1	.89301	1.1525	.383912	1.040	.8308	1.515	1.420	1.064	.989827	.445423
1.2634	4.1333-1	4.7056-1	.88453	1.1943	.393317	1.060	.8000	1.650	1.525	1.078	.982935	.420510
1.3055	3.9076-1	4.4875-1	.87714	1.2291	.396268	1.080	.7762	1.769	1.616	1.010	.975359	.400636
1.3423	3.7147-1	4.2991-1	.87048	1.2595	.396647	1.100	.7566	1.877	1.697	1.101	.967328	.384015
1.4854	3.0155-1	3.6117-1	.84319	1.3745	.396792	1.200	.6909	2.328	2.022	1.145	.924328	.326674
1.5930	2.5503-1	3.1444-1	.82142	1.4573	.386364	1.300	.6505	2.700	2.274	1.179	.880968	.290511
1.6816	2.2213-1	2.7933-1	.80279	1.5230	.376871	1.400	.6218	3.027	2.484	1.209	.839610	.264569
1.7578	1.9597-1	2.5171-1	.78636	1.5777	.364374	1.500	.5998	3.323	2.666	1.236	.800923	.244682
1.8250	1.7504-1	2.2919-1	.77159	1.6245	.351734	1.600	.5823	3.597	2.827	1.261	.765196	.228777
1.8853	1.5786-1	2.1042-1	.75815	1.6655	.339370	1.700	.5678	3.852	2.971	1.284	.731169	.215672
1.9403	1.4352-1	1.9450-1	.74581	1.7015	.327442	1.800	.5556	4.092	3.102	1.306	.701178	.204628
1.9908	1.3136-1	1.8082-1	.73435	1.7340	.316156	1.900	.5450	4.319	3.222	1.327	.673134	.195152
2.0376	1.2093-1	1.6892-1	.72376	1.7633	.305455	2.000	.5359	4.535	3.333	1.347	.646058	.186921
2.0812	1.1186-1	1.5847-1	.71385	1.7901	.295305	2.100	.5278	4.742	3.435	1.365	.622719	.179670
2.1221	1.0397-1	1.4922-1	.70455	1.8146	.285747	2.200	.5206	4.940	3.531	1.384	.600207	.173229
2.1607	9.6997-2	1.4097-1	.69578	1.8372	.276732	2.300	.5141	5.129	3.620	1.401	.579225	.167461
2.1971	9.0813-2	1.3358-1	.68751	1.8582	.268235	2.400	.5083	5.312	3.704	1.418	.559685	.162257
2.2317	8.5280-2	1.2690-1	.67967	1.8778	.260237	2.500	.5030	5.489	3.783	1.434	.541375	.157526
2.2646	8.0322-2	1.2084-1	.67223	1.8960	.252633	2.600	.4981	5.660	3.858	1.450	.524278	.153204
2.2960	7.5842-2	1.1532-1	.66515	1.9131	.245471	2.700	.4936	5.825	3.928	1.465	.508210	.149234
2.3260	7.1767-2	1.1028-1	.65841	1.9292	.238679	2.800	.4895	5.985	3.995	1.480	.493109	.145580
2.3548	6.8093-2	1.0554-1	.65196	1.9444	.232280	2.900	.4856	6.141	4.059	1.494	.478980	.142193
2.3825	6.4770-2	1.0137-1	.64579	1.9588	.226132	3.000	.4820	6.293	4.120	1.509	.465473	.139042
2.4348	5.8790-2	9.3767-2	.63423	1.9853	.214924	3.200	.4756	6.584	4.234	1.535	.440815	.133368
2.4834	5.3749-2	8.7198-2	.62354	2.0093	.204728	3.400	.4699	6.862	4.339	1.551	.418676	.128379
2.5290	4.9417-2	8.1467-2	.61363	2.0312	.195455	3.600	.4648	7.127	4.435	1.586	.398691	.123948
2.5718	4.5660-2	7.6425-2	.60443	2.0512	.186996	3.800	.4602	7.380	4.525	1.609	.380568	.119979
2.6123	4.2355-2	7.1955-2	.59577	2.0697	.179246	4.000	.4561	7.624	4.609	1.632	.364035	.116403
2.6506	3.9461-2	6.7961-2	.58766	2.0864	.172127	4.200	.4523	7.858	4.687	1.654	.348917	.113153
2.6870	3.6915-2	6.4386-2	.58003	2.1027	.165553	4.400	.4489	8.085	4.760	1.675	.335032	.110184
2.7218	3.4627-2	6.1155-2	.57283	2.1176	.159474	4.600	.4457	8.303	4.829	1.695	.322221	.107463
2.7549	3.2575-2	5.8224-2	.56601	2.1315	.153854	4.800	.4428	8.515	4.895	1.715	.310377	.104952
2.7867	3.0726-2	5.5554-2	.55956	2.1446	.148641	5.000	.4400	8.720	4.957	1.734	.299393	.102627
2.8676	2.6823-2	4.9818-2	.54471	2.1741	.136937	5.500	.4340	9.207	5.098	1.779	.275113	.097495
2.9279	2.3769-2	4.5131-2	.53149	2.1999	.127015	6.000	.4289	9.663	5.224	1.822	.254557	.093138
2.9848	2.1175-2	4.1232-2	.51958	2.2227	.118463	6.500	.4244	10.092	5.337	1.852	.236914	.089380

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TABLE II.- Continued

(a) Continued

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
3.0471	1.9079-2	3.7939-2	.50878	2.2431	.111012	7.000	.4205	10.497	5.439	1.933	.221602	.086094
3.1005	1.7318-2	3.5121-2	.49989	2.2615	.104458	7.500	.4170	10.882	5.532	1.936	.208182	.083167
3.1504	1.5824-2	3.2685-2	.48981	2.2782	.098656	8.000	.4139	11.249	5.618	1.970	.196330	.080596
3.1974	1.4540-2	3.0558-2	.48142	2.2935	.093478	8.500	.4111	11.599	5.697	2.003	.185780	.078267
3.2417	1.3428-2	2.8684-2	.47361	2.3075	.088822	9.000	.4086	11.936	5.770	2.034	.176323	.076153
3.2838	1.2456-2	2.7023-2	.46633	2.3205	.084621	9.500	.4063	12.259	5.838	2.065	.167803	.074227
3.3237	1.1599-2	2.5539-2	.45952	2.3325	.080805	10.000	.4041	12.571	5.902	2.094	.160081	.072460
3.3982	1.0165-2	2.3003-2	.44709	2.3542	.074144	11.000	.4003	13.163	6.019	2.149	.146628	.069326
3.4664	9.0137-3	2.0917-2	.43600	2.3733	.068515	12.000	.3970	13.718	6.123	2.231	.135294	.066624
3.5295	8.0720-3	1.9171-2	.42600	2.3903	.063697	13.000	.3941	14.242	6.217	2.290	.125619	.064258
3.5882	7.2895-3	1.7683-2	.41693	2.4055	.059527	14.000	.3916	14.739	6.302	2.296	.117258	.062166
3.6431	6.6298-3	1.6415-2	.40862	2.4193	.055875	15.000	.3892	15.212	6.379	2.340	.109951	.060298
3.6947	6.0677-3	1.5310-2	.40098	2.4319	.052654	16.000	.3872	15.664	6.451	2.382	.103518	.058615
3.7434	5.5831-3	1.4341-2	.39392	2.4434	.049791	17.000	.3853	16.097	6.517	2.423	.097808	.057088
3.7895	5.1632-3	1.3486-2	.38736	2.4540	.047229	18.000	.3836	16.512	6.578	2.462	.092703	.055696
3.8333	4.7949-3	1.2725-2	.38123	2.4638	.044922	19.000	.3820	16.913	6.636	2.499	.088116	.054416
3.8751	4.4700-3	1.2044-2	.37549	2.4729	.042834	20.000	.3805	17.299	6.690	2.535	.083967	.053235
3.9151	4.1816-3	1.1431-2	.37010	2.4815	.040936	21.000	.3791	17.673	6.740	2.570	.080196	.052143
3.9533	3.9241-3	1.0877-2	.36502	2.4895	.039201	22.000	.3779	18.035	6.788	2.603	.076756	.051125
3.9899	3.6931-3	1.0373-2	.36022	2.4970	.037611	23.000	.3767	18.385	6.833	2.635	.073603	.050176
4.0251	3.4847-3	9.9126-3	.35567	2.5040	.036145	24.000	.3755	18.727	6.876	2.668	.070704	.049287
4.0591	3.2959-3	9.4906-3	.35136	2.5107	.034794	25.000	.3745	19.059	6.916	2.699	.068026	.048451
4.0918	3.1242-3	9.1029-3	.34725	2.5170	.033539	26.000	.3735	19.382	6.955	2.729	.065547	.047664
4.1234	2.9675-3	8.7449-3	.34333	2.5230	.032373	27.000	.3726	19.697	6.992	2.758	.063244	.046922
4.1540	2.8240-3	8.4135-3	.33959	2.5237	.031287	28.000	.3717	20.003	7.026	2.747	.061097	.046221
4.1837	2.6920-3	8.1058-3	.33601	2.5341	.030272	29.000	.3708	20.303	7.060	2.814	.059095	.045554
4.2124	2.5706-3	7.8200-3	.33259	2.5393	.029324	30.000	.3700	20.596	7.092	2.842	.057225	.044922
4.2675	2.3542-3	7.3033-3	.32614	2.5490	.027595	32.000	.3686	21.164	7.153	2.894	.053817	.043745
4.3196	2.1676-3	6.8498-3	.32016	2.5579	.026063	34.000	.3672	21.710	7.209	2.945	.050797	.042672
4.3690	2.0054-3	6.4488-3	.31462	2.5660	.024694	36.000	.3659	22.235	7.262	2.994	.048107	.041686
4.4161	1.8631-3	6.0913-3	.30945	2.5737	.023464	38.000	.3648	22.741	7.310	3.041	.045686	.040779
4.4612	1.7374-3	5.7709-3	.30460	2.5807	.022352	40.000	.3637	23.231	7.356	3.086	.043502	.039939
4.5043	1.6257-3	5.4820-3	.30004	2.5873	.021342	42.000	.3627	23.705	7.399	3.130	.041519	.039157
4.5456	1.5260-3	5.2204-3	.29575	2.5935	.020420	44.000	.3618	24.164	7.440	3.173	.039711	.038428
4.5854	1.4364-3	4.9822-3	.29169	2.5993	.019576	46.000	.3609	24.611	7.478	3.214	.038055	.037745
4.6237	1.3555-3	4.7646-3	.28785	2.6048	.018805	48.000	.3601	25.045	7.515	3.254	.036534	.037104
4.6607	1.2823-3	4.5649-3	.28420	2.6100	.018084	50.000	.3593	25.468	7.549	3.293	.035131	.036500
4.7479	1.1262-3	4.1311-3	.27582	2.6218	.016514	55.000	.3575	26.480	7.629	3.387	.032058	.035131
4.8285	1.0004-3	3.7719-3	.26834	2.6322	.015194	60.000	.3560	27.436	7.700	3.475	.029484	.033930
4.9037	8.9709-4	3.4695-3	.26161	2.6415	.014078	65.000	.3546	28.343	7.765	3.559	.027297	.032864
4.9742	8.1096-4	3.2115-3	.25549	2.6499	.013114	70.000	.3533	29.207	7.824	3.637	.025415	.031909
5.0405	7.3870-4	2.9898-3	.24989	2.6575	.012275	75.000	.3522	30.033	7.877	3.715	.023773	.031046
5.1033	6.7605-4	2.7947-3	.24475	2.6645	.011559	80.000	.3512	30.826	7.927	3.788	.022341	.030261
5.1628	6.2242-4	2.6240-3	.23999	2.6709	.010865	85.000	.3502	31.588	7.973	3.858	.021069	.029542
5.2195	5.7578-4	2.4729-3	.23557	2.6767	.010304	90.000	.3493	32.323	8.016	3.926	.019936	.028881
5.2738	5.3462-4	2.3378-3	.23146	2.6822	.009781	95.000	.3485	33.034	8.056	3.991	.018919	.028270
5.3256	4.9869-4	2.2166-3	.22760	2.6873	.009319	100.000	.3478	33.721	8.094	4.054	.018002	.027702
5.3754	4.6655-4	2.1075-3	.22396	2.6920	.008882	105.000	.3471	34.388	8.129	4.116	.017173	.027173
5.4233	4.3746-4	2.0034-3	.22057	2.6965	.008493	110.000	.3464	35.035	8.162	4.175	.016413	.026678
5.4694	4.1207-4	1.9141-3	.21736	2.7007	.008135	115.000	.3458	35.665	8.194	4.233	.015720	.026214
5.5137	3.8860-4	1.8355-3	.21431	2.7046	.007808	120.000	.3452	36.278	8.224	4.269	.015083	.025777
5.5570	3.6771-4	1.7596-3	.21142	2.7083	.007505	125.000	.3446	36.876	8.252	4.344	.014497	.025365
5.5986	3.4851-4	1.6897-3	.20867	2.7119	.007227	130.000	.3441	37.461	8.280	4.397	.013955	.024979
5.6390	3.3099-4	1.6251-3	.20606	2.7152	.006965	135.000	.3436	38.030	8.306	4.449	.013451	.024606
5.6781	3.1475-4	1.5653-3	.20357	2.7184	.006727	140.000	.3431	38.587	8.331	4.500	.012985	.024255
5.7532	2.8659-4	1.4573-3	.19392	2.7243	.006292	150.000	.3423	39.666	8.377	4.598	.012141	.023604
5.7892	2.7402-4	1.4093-3	.19671	2.7271	.006095	155.000	.3418	40.183	8.399	4.645	.011759	.023302
5.8243	2.6236-4	1.3639-3	.19461	2.7297	.005910	160.000	.3414	40.703	8.420	4.693	.011401	.023011
5.8585	2.5154-4	1.3214-3	.19260	2.7323	.005747	165.000	.3411	41.205	9.440	4.739	.011065	.022734
5.8919	2.4146-4	1.2814-3	.19065	2.7347	.005573	170.000	.3407	41.701	8.460	4.784	.010747	.022467
5.9244	2.3207-4	1.2437-3	.18875	2.7371	.005419	175.000	.3404	42.186	8.479	4.829	.010448	.022212
5.9563	2.2328-4	1.2081-3	.18698	2.7393	.005272	180.000	.3400	42.663	8.497	4.871	.010164	.021967
5.9875	2.1506-4	1.1745-3	.18525	2.7415	.005134	185.000	.3397	43.131	8.515	4.914	.009897	.021731
6.0180	2.0734-4	1.1428-3	.18357	2.7436	.005003	190.000	.3394	43.595	8.532	4.956	.009642	.021503
6.0478	2.0010-4	1.1127-3	.18195	2.7456	.004878	195.000	.3391	44.048	8.549	4.997	.009401	.021284
6.0770	1.9327-4	1.0841-3	.18037	2.7475	.004759	200.000	.3388	44.497	8.565	5.038	.009172	.021072
6.1057	1.8683-4	1.0567-3	.17885	2.7494	.004646	205.000	.3385	44.937	8.581	5.078	.008953	.020868
6.1337	1.8077-4	1.0311-3	.17733	2.7512	.004539	210.000	.3382	45.373	8.596	5.117	.008745	.020672
6.1611	1.7502-4	1.0064-3	.17594	2.7530	.004436	215.000	.3379	45.799	8.611	5.156	.008546	.020480
6.1804	1.6960-4	9.8228-4	.17456	2.7547	.004335	220.000	.3377	46.220	8.625	5.174	.008355	.020296

TABLE II. - Continued

(a) Concluded

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	$A/A^\bullet$	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
6.2150	1.6444-4	9.6054-4	.17321	2.7563	.004244	225.000	.3374	46.636	8.639	5.232	.008174	.020117
6.2410	1.5956-4	9.3913-4	.17190	2.7579	.004154	230.000	.3372	47.048	8.653	5.269	.008001	.019943
6.2667	1.5492-4	9.1861-4	.17063	2.7595	.004068	235.000	.3369	47.453	8.666	5.306	.007834	.019774
6.2919	1.5051-4	8.9900-4	.16939	2.7610	.003985	240.000	.3367	47.854	8.679	5.342	.007675	.019611
6.3167	1.4631-4	8.8017-4	.16818	2.7625	.003906	245.000	.3365	48.251	8.692	5.378	.007522	.019451
6.3411	1.4231-4	8.6214-4	.16700	2.7639	.003830	250.000	.3363	48.639	8.704	5.413	.007375	.019297
6.3652	1.3849-4	8.4479-4	.16586	2.7653	.003757	255.000	.3361	49.025	8.716	5.448	.007233	.019147
6.3888	1.3485-4	8.2815-4	.15474	2.7666	.003686	260.000	.3359	49.405	8.727	5.482	.007097	.019002
6.4121	1.3136-4	8.1212-4	.16365	2.7680	.003619	265.000	.3356	49.783	8.739	5.516	.006966	.018859
6.4350	1.2803-4	7.9672-4	.16259	2.7692	.003553	270.000	.3355	50.158	8.751	5.550	.006840	.018720
6.4576	1.2485-4	7.8189-4	.16155	2.7705	.003490	275.000	.3353	50.523	8.761	5.583	.006718	.018586
6.4799	1.2180-4	7.6758-4	.16054	2.7718	.003429	280.000	.3351	50.890	8.772	5.616	.006600	.018453
6.5018	1.1887-4	7.5380-4	.15955	2.7729	.003371	285.000	.3349	51.250	8.783	5.649	.006487	.018325
6.5235	1.1606-4	7.4047-4	.15858	2.7741	.003314	290.000	.3347	51.606	8.793	5.681	.006377	.018200
6.5448	1.1337-4	7.2764-4	.15763	2.7752	.003259	295.000	.3345	51.960	8.803	5.713	.006271	.018077
6.5659	1.1078-4	7.1521-4	.15671	2.7763	.003206	300.000	.3344	52.309	8.813	5.744	.006169	.017958
6.6072	1.0590-4	6.9163-4	.15492	2.7785	.003105	310.000	.3340	53.000	8.832	5.806	.005974	.017726
6.6475	1.0137-4	6.6920-4	.15320	2.7805	.003010	320.000	.3337	53.677	8.851	5.867	.005791	.017505
6.6867	9.7177-5	6.4870-4	.15154	2.7825	.002921	330.000	.3334	54.338	8.869	5.927	.005619	.017294
6.7251	9.3263-5	6.2924-4	.14996	2.7844	.002837	340.000	.3331	54.989	8.886	5.935	.005457	.017092
6.7625	8.9621-5	6.1068-4	.14843	2.7862	.002751	350.000	.3328	55.628	8.902	6.042	.005304	.016897
6.7991	8.6209-5	5.9352-4	.14695	2.7880	.002683	360.000	.3325	56.257	8.918	6.099	.005159	.016710
6.8349	8.3019-5	5.7714-4	.14554	2.7896	.002617	370.000	.3323	56.876	8.934	6.154	.005022	.016530
6.8700	8.0010-5	5.6164-4	.14417	2.7913	.002545	380.000	.3320	57.464	8.949	6.209	.004893	.016357
6.9043	7.7215-5	5.4632-4	.14284	2.7929	.002461	390.000	.3318	58.083	8.964	6.263	.004769	.016190
6.9379	7.4573-5	5.3247-4	.14156	2.7943	.002423	400.000	.3315	58.673	8.978	6.315	.004653	.016029
7.0033	6.9723-5	5.0705-4	.13912	2.7972	.002307	420.000	.3311	59.828	9.005	6.419	.004435	.015722
7.0662	6.5396-5	4.8355-4	.13683	2.7999	.002205	440.000	.3306	60.950	9.031	6.519	.004237	.015435
7.1268	6.1510-5	4.6211-4	.13467	2.8024	.002111	460.000	.3302	62.041	9.055	6.616	.004056	.015166
7.1854	5.8005-5	4.4243-4	.13263	2.8048	.002024	480.000	.3298	63.104	9.078	6.711	.003890	.014913
7.2421	5.4831-5	4.2444-4	.13070	2.8070	.001945	500.000	.3295	64.141	9.100	6.803	.003737	.014674
7.3105	5.1263-5	4.0385-4	.12842	2.8097	.001854	525.000	.3290	65.403	9.126	6.916	.003561	.014394
7.3764	4.8077-5	3.8516-4	.12629	2.8121	.001771	550.000	.3286	66.630	9.151	7.024	.003402	.014131
7.4399	4.5216-5	3.6811-4	.12428	2.8145	.001645	575.000	.3282	67.823	9.174	7.130	.003257	.013885
7.5012	4.2637-5	3.5249-4	.12239	2.8167	.001626	600.000	.3279	68.985	9.197	7.233	.003123	.013653
7.6181	3.8176-5	3.2491-4	.11848	2.8207	.001503	650.000	.3272	71.226	9.238	7.432	.002886	.013227
7.7281	3.4462-5	3.0132-4	.11571	2.8243	.001378	700.000	.3266	73.368	9.276	7.621	.002683	.012944
7.8314	3.1310-5	2.8091-4	.11294	2.8275	.001316	750.000	.3260	75.418	9.311	7.802	.002507	.012497
7.9305	2.7656-5	2.6308-4	.11021	2.8305	.001225	800.000	.3255	77.388	9.343	7.975	.002352	.012182
8.0242	2.6352-5	2.4736-4	.10776	2.8333	.001155	850.000	.3251	79.286	9.373	8.142	.002216	.011893
8.1137	2.4344-5	2.3341-4	.10555	2.8358	.001092	900.000	.3246	81.117	9.401	8.302	.002094	.011626
8.2815	2.1047-5	2.0973-4	.10153	2.8404	.000969	1000.000	.3238	84.606	9.453	8.608	.001888	.011150
8.3604	1.9673-5	1.9960-4	.09972	2.8424	.000939	1050.000	.3234	86.270	9.476	8.753	.001799	.010937
8.4364	1.8446-5	1.9040-4	.09802	2.8443	.000896	1100.000	.3231	87.889	9.498	8.895	.001718	.010737
8.5096	1.7346-5	1.8201-4	.09642	2.8461	.000857	1150.000	.3227	89.466	9.519	9.032	.001644	.010549
8.5804	1.6353-5	1.7432-4	.09491	2.8477	.000822	1200.000	.3224	91.000	9.533	9.165	.001577	.010373
8.6489	1.5454-5	1.6726-4	.09348	2.8494	.000790	1250.000	.3221	92.495	9.558	9.296	.001514	.010206

TABLE II.- Continued

(b) Product mixture B

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
0.0000	1.0000 0	1.0000 0	1.0000	0.0000	0.000000	0.000						
.0249	9.9985-1	9.9995-1	.99995	.0249	.000393	24.000						
.0299	9.9949-1	9.9955-1	.91995	.0299	.000504	20.000						
.0341	9.9934-1	9.9942-1	.99954	.0341	.000658	17.500						
.0393	9.9910-1	9.9920-1	.99951	.0393	.000876	15.000						
.0478	9.9871-1	9.9886-1	.99986	.0478	.001271	12.500						
.0598	9.9798-1	9.9821-1	.99941	.0598	.002018	10.000						
.0799	9.9640-1	9.9682-1	.99506	.0799	.003593	7.500						
.1203	9.9175-1	9.9272-1	.97722	.1202	.006117	5.000						
.1359	9.8941-1	9.9106-1	.99703	.1358	.010036	4.500						
.1510	9.8719-1	9.8867-1	.94677	.1509	.012735	4.000						
.1733	9.8318-1	9.8538-1	.99638	.1731	.016695	3.500						
.2034	9.7691-1	9.7956-1	.99776	.2031	.022849	3.000						
.2466	9.6626-1	9.7011-1	.99671	.2451	.033225	2.500						
.2763	9.5786-1	9.6265-1	.99588	.2756	.041347	2.250						
.3145	9.4576-1	9.5187-1	.99466	.3135	.052904	2.000						
.3545	9.3169-1	9.3730-1	.77323	.3530	.066141	1.800						
.4073	9.1060-1	9.2035-1	.99135	.4251	.083402	1.600						
.4821	8.7772-1	8.9107-1	.94750	.4764	.115347	1.400						
.5336	8.5215-1	8.6844-1	.78480	.5287	.137262	1.300						
.5650	8.3536-1	8.5356-1	.98295	.5572	.156959	1.250						
.6020	8.1619-1	8.3636-1	.99073	.5945	.167324	1.200						
.6466	7.9146-1	8.1365-1	.97794	.6379	.187214	1.150						
.7032	7.5942-1	7.8400-1	.67306	.6921	.212359	1.100						
.7831	7.1174-1	7.4035-1	.76781	.7675	.246804	1.050						
.8434	6.7496-1	7.0655-1	.96249	.8244	.271455	1.025						
.9671	5.9849-1	6.3512-1	.75162	.9330	.316534	1.001						
1.0000	5.7424-1	6.1502-1	.94350	.9688	.329947	1.000						
1.0330	5.5964-1	5.9702-1	.74523	.9967	.336750	1.001	.9653	1.074	1.066	1.006	.999993	.558049
1.1093	5.1442-1	5.5536-1	.53772	1.0637	.355440	1.010	.9051	1.236	1.206	1.020	.998681	.515099
1.1496	4.8822-1	5.3347-1	.73292	1.1030	.364993	1.020	.8711	1.343	1.297	1.029	.996513	.489994
1.1857	4.6843-1	5.1152-1	.92512	1.1356	.371335	1.030	.8468	1.428	1.369	1.035	.993824	.471242
1.2129	4.5178-1	4.9532-1	.92583	1.1566	.376011	1.040	.8274	1.502	1.432	1.041	.990812	.455967
1.2617	4.2405-1	4.6844-1	.92016	1.2209	.382345	1.060	.7960	1.630	1.538	1.050	.984051	.431431
1.3028	4.0223-1	4.4700-1	.91525	1.2363	.386366	1.080	.7731	1.743	1.631	1.057	.976638	.411854
1.3330	3.8313-1	4.2319-1	.91080	1.2672	.388411	1.100	.7535	1.845	1.713	1.064	.968790	.395469
1.4794	3.1416-1	3.5926-1	.39293	1.3448	.385314	1.200	.6872	2.269	2.048	1.089	.926667	.338910
1.5840	2.6812-1	3.1248-1	.17356	1.4043	.38147	1.300	.6460	2.613	2.309	1.109	.884136	.303255
1.6636	2.3422-1	2.7738-1	.55639	1.5570	.370550	1.400	.6164	2.913	2.530	1.125	.843461	.277678
1.7425	2.0760-1	2.4570-1	.65565	1.5935	.356565	1.500	.5938	3.182	2.722	1.139	.805446	.258073
1.8065	1.8668-1	2.2711-1	.1459t	1.6421	.346404	1.600	.5756	3.428	2.893	1.152	.770122	.242398
1.8635	1.6923-1	2.0440-1	.43711	1.6847	.334484	1.700	.5609	3.656	3.048	1.164	.737447	.229479
1.9150	1.5490-1	1.9247-1	.82094	1.7229	.323012	1.800	.5477	3.869	3.190	1.175	.707257	.218584
1.9621	1.4214-1	1.7332-1	.42133	1.7567	.312069	1.900	.5367	4.068	3.320	1.185	.679312	.209243
2.0054	1.3141-1	1.6694-1	.81421	1.7877	.301653	2.000	.5270	4.257	3.441	1.195	.653426	.201114
2.0456	1.2237-1	1.5650-1	.80756	1.8160	.291877	2.100	.5185	4.436	3.554	1.204	.629394	.193953
2.0830	1.1368-1	1.4728-1	.80116	1.8421	.282616	2.200	.5109	4.607	3.659	1.213	.607082	.187587
2.1180	1.0663-1	1.3905-1	.77514	1.8663	.273877	2.300	.5040	4.770	3.759	1.222	.586270	.181879
2.1510	1.0017-1	1.3167-1	.75540	1.8680	.265625	2.400	.4978	4.926	3.852	1.230	.566862	.176714
2.1821	9.4370-2	1.2501-1	.73393	1.9091	.257834	2.500	.4921	5.077	3.941	1.238	.548694	.172022
2.2115	8.9176-2	1.1843-1	.77865	1.9294	.250473	2.600	.4869	5.222	4.025	1.245	.531682	.167725
2.2396	8.4174-2	1.1343-1	.77165	1.9477	.243506	2.700	.4821	5.361	4.105	1.252	.515694	.163780
2.2663	8.0174-2	1.0846-1	.76861	1.9654	.236901	2.800	.4777	5.496	4.182	1.259	.500674	.160132
2.2918	7.6202-2	1.0385-1	.76415	1.9815	.230607	2.900	.4735	5.627	4.254	1.266	.486478	.156762
2.3162	7.2677-2	9.9594-2	.75965	1.9975	.224733	3.000	.4697	5.754	4.324	1.273	.473124	.153612
2.3620	6.6347-2	9.2035-2	.75193	2.0266	.213759	3.200	.4627	5.997	4.456	1.286	.448498	.147933
2.4044	6.0936-2	8.5505-2	.74306	2.0536	.203834	3.400	.4565	6.227	4.577	1.299	.426384	.142913
2.4433	5.6265-2	7.9815-2	.73545	2.0772	.194755	3.600	.4510	6.446	4.690	1.310	.406409	.138444
2.4807	5.2145-2	7.4813-2	.72833	2.0995	.186413	3.800	.4460	6.655	4.795	1.322	.388249	.134438
2.5155	4.8617-2	7.0378-2	.72152	2.1202	.178903	4.000	.4415	6.855	4.894	1.333	.371676	.130804
2.5492	4.5494-2	6.6420-2	.71504	2.1394	.171951	4.200	.4374	7.048	4.987	1.343	.356511	.127496
2.5792	4.2636-2	6.2478-2	.70885	2.1573	.165465	4.400	.4336	7.233	5.075	1.354	.342557	.124464
2.6037	4.0114-2	5.9650-2	.70293	2.1741	.159527	4.600	.4301	7.411	5.158	1.364	.329689	.121674
2.6368	3.7844-2	5.6780-2	.69726	2.1899	.153930	4.800	.4269	7.584	5.237	1.374	.317771	.119092
2.6637	3.5742-2	5.4141-2	.69182	2.2043	.148581	5.000	.4239	7.750	5.312	1.383	.306714	.116696
2.7260	3.1424-2	4.8474-2	.67507	2.2337	.137377	5.500	.4172	8.146	5.494	1.406	.282238	.111374
2.7827	2.7933-2	4.3451-2	.56741	2.2684	.127603	6.000	.4115	8.516	5.639	1.423	.261477	.106830
2.8346	2.5066-2	4.0010-2	.65667	2.2941	.119164	6.500	.4066	8.862	5.779	1.449	.243633	.102884

TABLE II.- Continued

(b) Continued

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
2.8827	2.2619-2	3.6776-2	.64673	2.3198	.111801	7.000	.4022	9.190	5.907	1.468	.228125	.099416
2.9275	2.0666-2	3.4002-2	.63747	2.3404	.105322	7.500	.3983	9.500	6.024	1.487	.214520	.096336
2.9674	1.8947-2	3.1511-2	.62882	2.3601	.099570	8.000	.3948	9.796	6.133	1.505	.202487	.093572
3.0089	1.7465-2	2.9525-2	.62070	2.3782	.094434	8.500	.3917	10.079	6.234	1.522	.191764	.091076
3.0463	1.6175-2	2.7690-2	.61307	2.3944	.089813	9.000	.3888	10.349	6.328	1.539	.182141	.088807
3.0817	1.5045-2	2.6064-2	.60586	2.4104	.085617	9.500	.3862	10.609	6.416	1.555	.173467	.086729
3.1154	1.4046-2	2.4614-2	.59905	2.4248	.081842	10.000	.3838	10.859	6.498	1.571	.165597	.084819
3.1784	1.2365-2	2.2138-2	.58644	2.4509	.075203	11.000	.3795	11.334	6.650	1.600	.151866	.081419
3.2362	1.1008-2	2.0104-2	.57502	2.4740	.069584	12.000	.3758	11.778	6.786	1.628	.140280	.078474
3.2898	9.8937-3	1.8404-2	.56459	2.4946	.064757	13.000	.3725	12.197	6.909	1.655	.130376	.075886
3.3393	8.9637-3	1.6953-2	.55502	2.5132	.060585	14.000	.3695	12.592	7.021	1.680	.121801	.073593
3.3860	8.1774-3	1.5727-2	.54618	2.5301	.056930	15.000	.3669	12.968	7.125	1.704	.114312	.071536
3.4300	7.5052-3	1.4655-2	.53799	2.5455	.053697	16.000	.3646	13.327	7.220	1.727	.107709	.069681
3.4721	6.9249-3	1.3717-2	.53035	2.5596	.050821	17.000	.3624	13.669	7.309	1.749	.101840	.067998
3.5110	6.4165-3	1.2838-2	.52321	2.5723	.048242	18.000	.3604	13.997	7.392	1.770	.096582	.066457
3.5490	5.9744-3	1.2152-2	.51651	2.5849	.045913	19.000	.3586	14.313	7.469	1.790	.091860	.065038
3.5847	5.5818-3	1.1494-2	.51020	2.5963	.043814	20.000	.3569	14.616	7.542	1.810	.087584	.063731
3.6188	5.2326-3	1.0932-2	.50425	2.6069	.041899	21.000	.3553	14.909	7.611	1.829	.083697	.062518
3.6515	4.9201-3	1.0367-2	.49862	2.6165	.040145	22.000	.3539	15.192	7.676	1.847	.080145	.061390
3.6823	4.6392-3	9.8811-3	.49328	2.6262	.038534	23.000	.3525	15.466	7.737	1.865	.076887	.060337
3.7129	4.3833-3	9.4377-3	.48121	2.6350	.037056	24.000	.3512	15.731	7.796	1.882	.073689	.059350
3.7419	4.1550-3	9.0315-3	.48330	2.6434	.035687	25.000	.3500	15.989	7.852	1.898	.071120	.058423
3.7698	3.9453-3	8.6582-3	.47877	2.6515	.034417	26.000	.3489	16.239	7.905	1.914	.068556	.057548
3.7958	3.7535-3	8.3140-3	.47436	2.6593	.033237	27.000	.3478	16.482	7.955	1.930	.066172	.056723
3.8229	3.5776-3	7.9755-3	.47014	2.6665	.032136	28.000	.3468	16.720	8.004	1.945	.063953	.055941
3.8481	3.4158-3	7.7002-3	.46610	2.6723	.031103	29.000	.3458	16.950	8.051	1.960	.061880	.055201
3.8725	3.2665-3	7.4254-3	.46222	2.6794	.030145	30.000	.3449	17.176	8.096	1.975	.059940	.054495
3.9194	3.0000-3	6.9297-3	.45425	2.6915	.028367	32.000	.3431	17.611	8.180	2.003	.056408	.053185
3.9636	2.7648-3	6.4490-3	.44809	2.7026	.026831	34.000	.3416	18.027	8.259	2.030	.053275	.051989
4.0095	2.5569-3	6.1116-3	.44174	2.7132	.025434	36.000	.3401	18.426	8.332	2.055	.050478	.050862
4.0453	2.3925-3	5.7654-3	.43581	2.7229	.024185	38.000	.3388	18.809	8.401	2.080	.047964	.049881
4.0833	2.2364-3	5.4611-3	.43023	2.7317	.023052	40.000	.3375	19.179	8.465	2.104	.045692	.048944
4.1176	2.0974-3	5.1650-3	.42497	2.7403	.022027	42.000	.3363	19.535	8.526	2.127	.043630	.048072
4.1543	1.9729-3	4.9351-3	.42061	2.7483	.021092	44.000	.3352	19.880	8.584	2.149	.041747	.047259
4.1872	1.8610-3	4.7034-3	.41531	2.7557	.020220	46.000	.3342	20.213	8.638	2.170	.040024	.046497
4.2197	1.7596-3	4.5007-3	.41085	2.7627	.019427	48.000	.3333	20.537	8.690	2.191	.038438	.045782
4.2506	1.6679-3	4.3103-3	.40660	2.7694	.018645	50.000	.3323	20.851	8.740	2.211	.036976	.045108
4.3232	1.4717-3	3.8973-3	.39662	2.7847	.017089	55.000	.3303	21.599	8.854	2.260	.033771	.043579
4.3901	1.3129-3	3.5550-3	.38804	2.7982	.015741	60.000	.3284	22.300	8.957	2.305	.031083	.042238
4.4521	1.1820-3	3.2675-3	.38011	2.8103	.014593	65.000	.3268	22.962	9.050	2.347	.028797	.041046
4.5101	1.0715-3	3.0223-3	.37287	2.8212	.013613	70.000	.3253	23.589	9.135	2.387	.026827	.039977
4.5644	9.7769-4	2.8109-3	.36620	2.8312	.012741	75.000	.3240	24.185	9.214	2.425	.025114	.039010
4.6157	9.0019-4	2.6267-3	.36010	2.8403	.011983	80.000	.3228	24.754	9.286	2.462	.023608	.038130
4.6641	8.3141-4	2.4649-3	.35442	2.8487	.011312	85.000	.3217	25.300	9.354	2.497	.022276	.037324
4.7101	7.7103-4	2.3217-3	.34912	2.8565	.010713	90.000	.3206	25.823	9.417	2.530	.021087	.036582
4.7539	7.1851-4	2.1941-3	.34417	2.8637	.010175	95.000	.3197	26.327	9.476	2.562	.020020	.035894
4.7957	6.7144-4	2.0793-3	.33952	2.8705	.009698	100.000	.3188	26.813	9.532	2.593	.019057	.035255
4.8350	6.3026-4	1.9760-3	.33515	2.8768	.009254	105.000	.3179	27.281	9.584	2.623	.018184	.034661
4.8740	5.9254-4	1.8822-3	.33101	2.8827	.008845	110.000	.3171	27.736	9.634	2.652	.017387	.034102
4.9100	5.5957-4	1.7969-3	.32710	2.8883	.008477	115.000	.3164	28.176	9.681	2.680	.016659	.033579
4.9463	5.2902-4	1.7131-3	.32339	2.8935	.008133	120.000	.3157	28.604	9.726	2.707	.015990	.033085
4.9805	5.0145-4	1.6473-3	.31984	2.8986	.007827	125.000	.3150	29.019	9.768	2.734	.015373	.032619
5.0135	4.7610-4	1.5814-3	.31645	2.9034	.007533	130.000	.3144	29.423	9.809	2.759	.014802	.032178
5.0454	4.5301-4	1.5205-3	.31326	2.9078	.007273	135.000	.3138	29.817	9.848	2.784	.014273	.031760
5.0763	4.3219-4	1.4543-3	.31020	2.9121	.007021	140.000	.3132	30.200	9.885	2.809	.013780	.031363
5.1353	3.9479-4	1.3625-3	.30444	2.9202	.006571	150.000	.3122	30.941	9.955	2.856	.012862	.030624
5.1635	3.7817-4	1.3170-3	.30172	2.9239	.006357	155.000	.3117	31.301	9.989	2.879	.012490	.030278
5.1910	3.6273-4	1.2743-3	.29912	2.9275	.006157	160.000	.3112	31.651	10.021	2.901	.012112	.029948
5.2177	3.4818-4	1.2342-3	.29661	2.9310	.005996	165.000	.3108	31.993	10.051	2.923	.011757	.029632
5.2438	3.3499-4	1.1965-3	.29416	2.9343	.005825	170.000	.3103	32.330	10.081	2.944	.011422	.029378
5.2692	3.2248-4	1.1611-3	.29185	2.9375	.005668	175.000	.3099	32.659	10.110	2.965	.011106	.029037
5.2940	3.1077-4	1.1275-3	.28959	2.9406	.005514	180.000	.3095	32.982	10.138	2.985	.010807	.028757
5.3132	2.5574-4	1.0961-3	.28740	2.9435	.005370	185.000	.3091	33.301	10.165	3.005	.010524	.028485
5.3418	2.8947-4	1.0662-3	.28529	2.9464	.005233	190.000	.3087	33.611	10.191	3.025	.010255	.028226
5.3649	2.7716-4	1.0375-3	.28324	2.9492	.005105	195.000	.3083	33.917	10.216	3.044	.010000	.027975
5.3875	2.7081-4	1.0110-3	.28126	2.9519	.004982	200.000	.3080	34.219	10.241	3.063	.009758	.027732
5.4097	2.6157-4	9.8547-4	.27933	2.9545	.004864	205.000	.3076	34.515	10.265	3.082	.009527	.027497
5.4313	2.5351-4	9.6113-4	.27746	2.9569	.004753	210.000	.3073	34.807	10.288	3.101	.009307	.027270
5.4526	2.4608-4	9.3806-4	.27564	2.9594	.004645	215.000	.3070	35.094	10.310	3.119	.009097	.027050
5.4734	2.3875-4	9.1602-4	.27387	2.9617	.004547	220.000	.3067	35.376	10.332	3.137	.008896	.026838

TABLE II.- Continued

(b) Concluded

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
5.4938	2.3100-4	8.9497-4	.27216	2.9540	.004446	225.000	.3064	35.656	10.354	3.154	.008705	.026629
5.5139	2.2520-4	8.7485-4	.27049	2.9603	.004353	230.000	.3061	35.929	10.375	3.171	.008521	.026430
5.5335	2.1892-4	8.5562-4	.26896	2.9684	.004264	235.000	.3058	36.199	10.395	3.188	.008345	.026235
5.5529	2.1294-4	8.3720-4	.26727	2.9705	.004178	240.000	.3055	36.466	10.415	3.205	.008176	.026046
5.5719	2.0725-4	8.1955-4	.26572	2.9726	.004095	245.000	.3052	36.730	10.435	3.222	.008014	.025861
5.5905	2.0181-4	8.0262-4	.26421	2.9745	.004016	250.000	.3050	36.989	10.454	3.238	.007858	.025683
5.6089	1.9662-4	7.8637-4	.26273	2.9765	.003940	255.000	.3047	37.244	10.472	3.254	.007708	.025509
5.6269	1.9166-4	7.7076-4	.26129	2.9784	.003867	260.000	.3045	37.499	10.491	3.270	.007564	.025338
5.6447	1.8692-4	7.5574-4	.25989	2.9802	.003796	265.000	.3042	37.747	10.508	3.286	.007425	.025173
5.6621	1.8237-4	7.4130-4	.25851	2.9820	.003728	270.000	.3040	37.994	10.526	3.302	.007292	.025012
5.6793	1.7802-4	7.2739-4	.25717	2.9838	.003662	275.000	.3037	38.237	10.543	3.317	.007163	.024854
5.6963	1.7385-4	7.1400-4	.25585	2.9855	.003599	280.000	.3035	38.478	10.559	3.332	.007038	.024701
5.7129	1.6984-4	7.0108-4	.25456	2.9872	.003538	285.000	.3033	38.716	10.576	3.347	.006918	.024551
5.7294	1.6600-4	6.8861-4	.25330	2.9888	.003479	290.000	.3031	38.951	10.592	3.362	.006802	.024405
5.7456	1.6230-4	6.7653-4	.25207	2.9904	.003422	295.000	.3029	39.184	10.607	3.376	.006690	.024262
5.7616	1.5875-4	6.6495-4	.25086	2.9920	.003356	300.000	.3027	39.414	10.623	3.391	.006581	.024122
5.7928	1.5204-4	6.4246-4	.24852	2.9950	.003251	310.000	.3022	39.866	10.653	3.419	.006374	.023851
5.8233	1.4581-4	6.2216-4	.24626	2.9979	.003152	320.000	.3019	40.309	10.681	3.447	.006180	.023593
5.8529	1.4001-4	6.0275-4	.24409	3.0007	.003064	330.000	.3015	40.743	10.709	3.474	.005998	.023344
5.8819	1.3461-4	5.8449-4	.24199	3.0034	.002982	340.000	.3011	41.170	10.736	3.501	.005826	.023105
5.9101	1.2956-4	5.6731-4	.23997	3.0060	.002816	350.000	.3008	41.587	10.762	3.527	.005664	.022876
5.9376	1.2483-4	5.5109-4	.23803	3.0085	.002821	360.000	.3004	41.997	10.787	3.553	.005510	.022655
5.9645	1.2040-4	5.3577-4	.23614	3.0109	.002747	370.000	.3001	42.400	10.812	3.578	.005365	.022443
5.9903	1.1624-4	5.2127-4	.23431	3.0131	.002676	380.000	.2998	42.795	10.835	3.603	.005227	.022238
6.0166	1.1232-4	5.0753-4	.23255	3.0154	.002610	390.000	.2995	43.185	10.858	3.627	.005096	.022040
6.0416	1.0863-4	4.9454-4	.23083	3.0176	.002549	400.000	.2992	43.558	10.880	3.651	.004972	.021848
6.0907	1.0185-4	4.7041-4	.22756	3.0217	.002435	420.000	.2987	44.315	10.923	3.698	.004741	.021484
6.1377	9.5710-5	4.4855-4	.22447	3.0255	.002321	440.000	.2981	45.040	10.963	3.743	.004530	.021142
6.1829	9.0314-5	4.2855-4	.22155	3.0292	.002223	460.000	.2976	45.744	11.002	3.787	.004338	.020820
6.2266	8.5371-5	4.1003-4	.21878	3.0326	.002131	480.000	.2972	46.428	11.038	3.830	.004161	.020516
6.2687	8.0913-5	3.9321-4	.21614	3.0359	.002044	500.000	.2967	47.096	11.073	3.872	.003998	.020229
6.3195	7.5825-5	3.7401-4	.21303	3.0397	.001945	525.000	.2962	47.905	11.114	3.922	.003812	.019891
6.3684	7.1265-5	3.5651-4	.21005	3.0433	.001836	550.000	.2957	48.691	11.153	3.971	.003643	.019573
6.4154	6.7217-5	3.4070-4	.20731	3.0467	.001782	575.000	.2952	49.454	11.190	4.019	.003488	.019274
6.4609	6.3569-5	3.2615-4	.20467	3.0497	.001716	600.000	.2945	50.197	11.225	4.065	.003345	.018991
6.5473	5.7130-5	3.0049-4	.19978	3.0553	.001517	650.000	.2940	51.626	11.291	4.154	.003093	.018471
6.6284	5.1778-5	2.7454-4	.19534	3.0612	.001475	700.000	.2932	52.987	11.352	4.238	.002876	.018001
6.7049	4.7214-5	2.5555-4	.19126	3.0661	.001335	750.000	.2926	54.288	11.408	4.319	.002688	.017574
6.7774	4.3310-5	2.4298-4	.18751	3.0705	.001270	800.000	.2919	55.536	11.459	4.376	.002523	.017182
6.8463	4.0002-5	2.2337-4	.18414	3.0747	.001221	850.000	.2914	56.735	11.507	4.473	.002378	.016823
6.9120	3.7071-5	2.1543-4	.18081	3.0784	.001155	900.000	.2908	57.891	11.552	4.541	.002248	.016489
7.0351	3.2214-5	1.9346-4	.17477	3.0892	.001041	1000.000	.2898	60.089	11.634	4.677	.002027	.015891
7.0929	3.0106-5	1.6490-4	.17232	3.0933	.000933	1050.000	.2894	61.137	11.672	4.741	.001932	.015621
7.1435	2.8319-5	1.7503-4	.16962	3.0947	.000945	1100.000	.2890	62.153	11.707	4.834	.001846	.015368
7.2022	2.6754-5	1.6775-4	.16746	3.0940	.000907	1150.000	.2886	63.142	11.741	4.865	.001767	.015130
7.2541	2.5237-5	1.5063-4	.16572	3.0965	.000871	1200.000	.2882	64.105	11.773	4.924	.001695	.014904
7.3042	2.3916-5	1.5409-4	.16309	3.0987	.000837	1250.000	.2879	65.045	11.804	4.981	.001628	.014691

TABLE II.- Continued

(c) Product mixture C

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
0.0000	1.0000	1.0000	1.0000	0.0000	0.000000	∞						
.0249	9.9965-1	9.9969-1	.99997	.0249	.000346	24.003						
.0279	9.9950-1	9.9955-1	.99995	.0279	.000302	20.000						
.0341	9.9934-1	9.9942-1	.99994	.0341	.000633	17.500						
.0398	9.9911-1	9.9921-1	.99992	.0398	.000492	15.000						
.0478	9.9871-1	9.9886-1	.99989	.0478	.001233	12.500						
.0598	9.9799-1	9.9821-1	.99982	.0598	.002009	10.000						
.0799	9.9641-1	9.9682-1	.99968	.0799	.003577	7.500						
.1203	9.9169-1	9.9279-1	.99928	.1203	.000081	5.000						
.1559	9.8656-1	9.9107-1	.97911	.1559	.009994	4.500						
.1511	9.8725-1	9.8865-1	.97687	.1510	.012673	4.000						
.1733	9.8325-1	9.8515-1	.97651	.1732	.016622	3.500						
.2034	9.7701-1	9.7955-1	.97475	.2032	.022749	3.000						
.2467	9.6641-1	9.7010-1	.96659	.2462	.033075	2.500						
.2763	9.5803-1	9.6263-1	.96023	.2757	.041155	2.250						
.3146	9.4600-1	9.5186-1	.95312	.3138	.052613	2.000						
.3540	9.3199-1	9.3932-1	.94361	.3521	.065401	1.800						
.4074	9.1129-1	9.2076-1	.93134	.4055	.085000	1.600						
.4822	8.7823-1	8.9191-1	.93032	.4780	.114045	1.400						
.5337	8.5310-1	8.6877-1	.70611	.5269	.130000	1.300						
.5652	8.3708-1	8.5375-1	.96446	.5594	.150000	1.250						
.6021	8.1747-1	8.3567-1	.95243	.5942	.166005	1.200						
.6467	7.9266-1	8.1356-1	.91577	.6362	.180410	1.150						
.7054	7.5694-1	7.8333-1	.97210	.6947	.211441	1.100						
.7632	7.1279-1	7.4621-1	.97007	.7562	.195765	1.050						
.8435	8.7629-1	7.0621-1	.76010	.8240	.210000	1.020						
.9671	6.0010-1	6.3497-1	.75425	.9397	.215000	1.001						
1.0000	5.7992-1	6.1566-1	.75225	.9675	.525050	1.000						
1.0550	5.5977-1	5.9679-1	.95331	.9974	.333561	1.001	.9822	1.1075	1.005	1.004	.999999	.55971
1.1050	5.1041-1	5.5544-1	.74602	1.0045	.333767	1.010	.9022	1.253	1.067	1.016	.990789	.51703
1.1494	4.9025-1	5.3031-1	.73983	1.1030	.503512	1.020	.8712	1.345	1.110	1.026	.995557	.49130
1.1656	4.7041-1	5.1114-1	.93544	1.1540	.567055	1.030	.8469	1.472	1.173	1.031	.995920	.47306
1.2160	4.5306-1	4.9512-1	.93502	1.1570	.514421	1.040	.8217	1.450	1.232	1.038	.999962	.47002
1.2614	4.3000-1	4.6855-1	.92743	1.2020	.500749	1.500	.7760	1.622	1.243	1.044	.965100	.43320
1.3024	4.4040-1	4.4672-1	.92353	1.2753	.504500	1.000	.7767	1.727	1.230	1.050	.970011	.41504
1.3500	3.8534-1	4.2741-1	.91973	1.2804	.507524	1.100	.7553	1.803	.2718	1.056	.965000	.39766
1.4765	3.1045-1	3.5903-1	.90575	1.3395	.507761	1.200	.6808	2.221	1.002	1.078	.927199	.34130
1.5629	2.7055-1	3.1229-1	.89158	1.4714	.500181	1.300	.6452	2.575	.315	1.094	.004729	.30561
1.6661	2.3056-1	2.7710-1	.88111	1.5370	.509200	1.400	.6154	2.854	1.250	1.107	.844241	.26641
1.7407	2.1025-1	2.4942-1	.37174	1.5750	.552600	1.500	.5922	3.114	1.618	1.114	.771141	.25005
1.8042	1.6914-1	2.2685-1	.46574	1.6440	.545501	1.600	.5742	3.334	.726	1.129	.765616	.24271
1.8609	1.7169-1	2.0613-1	.95629	1.6672	.553551	1.700	.5590	3.565	3.005	1.136	.705676	.23255
1.9120	1.5704-1	1.9222-1	.34947	1.7430	.522490	1.800	.5460	3.622	3.146	1.146	.755475	.22105
1.9587	1.5440-1	1.7455-1	.64315	1.7993	.511157	1.900	.5349	4.015	3.337	1.154	.005611	.21605
2.0010	1.3501-1	1.6667-1	.637271	1.7761	.500053	2.000	.5251	4.171	3.462	1.161	.654765	.20450
2.0414	1.2446-1	1.5624-1	.63177	1.8190	.471606	2.100	.5165	4.370	3.577	1.168	.653645	.19766
2.0704	1.1624-1	1.4702-1	.32657	1.8655	.461800	2.200	.5067	4.553	3.665	1.182	.641666	.19165
2.1130	1.0872-1	1.3879-1	.82170	1.8755	.471606	2.300	.5016	4.607	3.766	1.180	.567602	.18585
2.1456	1.0248-1	1.3142-1	.61706	1.8650	.464551	2.400	.4952	4.657	3.002	1.180	.564445	.18003
2.1762	9.6670-2	1.2471-1	.61665	1.9141	.451605	2.500	.4911	4.901	3.571	1.192	.550519	.17502
2.2053	9.1435-2	1.1874-1	.65345	1.9340	.449611	2.600	.4844	5.119	4.029	1.197	.555262	.17144
2.2320	8.6695-2	1.1324-1	.60444	1.9527	.445940	2.700	.4792	5.251	4.141	1.202	.517592	.16701
2.2591	8.2364-2	1.0822-1	.60259	1.9723	.450000	2.800	.4725	5.376	4.219	1.207	.506374	.15990
2.2841	7.8447-2	1.0341-1	.79590	1.9870	.454154	2.900	.4707	5.501	4.294	1.211	.500226	.15565
2.3080	7.4842-2	9.8356-2	.79935	2.0020	.442660	3.000	.4660	5.623	4.374	1.216	.474660	.15265
2.3528	6.8401-2	7.1903-2	.73653	2.0520	.413557	3.200	.4597	5.847	4.501	1.224	.450563	.15041
2.3941	6.3015-2	8.5285-2	.78035	2.0500	.400000	3.400	.4530	6.061	4.607	1.232	.460625	.14745
2.4325	5.6627-2	7.9594-2	.11445	2.0855	.394426	3.600	.4471	6.263	4.745	1.250	.460625	.14605
2.4604	5.4107-2	7.4598-2	.15054	2.1002	.106170	3.800	.4422	6.456	4.825	1.247	.490104	.15094
2.5019	5.0571-2	7.0170-2	.76370	2.1212	.116042	4.000	.4375	6.639	4.952	1.254	.517556	.13579
2.5335	4.7510-2	6.6220-2	.15613	2.1407	.117070	4.200	.4357	6.902	5.027	1.261	.555605	.12472
2.5634	4.4515-2	6.2675-2	.15355	2.1647	.105602	4.400	.4290	6.962	5.144	1.267	.544444	.12721
2.5916	4.1950-2	5.9482-2	.14947	2.1820	.194547	4.600	.4262	7.145	5.222	1.274	.551567	.12541
2.6184	3.9657-2	5.6585-2	.14315	2.1902	.153050	4.800	.4229	7.270	5.312	1.279	.519062	.12450
2.6440	3.7571-2	5.3969-2	.74100	2.2134	.148700	5.000	.4190	7.641	5.391	1.286	.506623	.11757
2.7029	3.3135-2	4.8200-2	.73131	2.2449	.127690	5.000	.4129	7.799	5.572	1.299	.265110	.11600
2.7560	2.9554-2	4.3674-2	.72244	2.2705	.121507	6.000	.4270	8.162	.735	1.310	.265007	.11242
2.8042	2.6629-2	3.9834-2	.71426	2.3050	.117162	6.500	.4016	8.420	5.006	1.320	.245515	.10920

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TABLE II. - Continued

(c) Continued

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
2.8405	2.4179-2	3.6601-2	.70664	2.3304	.111633	7.000	.3972	8.713	6.019	1.335	.229996	.105129
2.8893	2.2107-2	3.3835-2	.69953	2.3527	.105277	7.500	.3932	8.981	6.144	1.346	.216372	.102170
2.9273	2.0333-2	3.1448-2	.69283	2.3751	.099650	8.000	.3895	9.236	6.260	1.357	.204318	.099511
2.9628	1.8799-2	2.9355-2	.68651	2.3920	.094533	8.500	.3862	9.477	6.368	1.367	.193568	.097116
2.9961	1.7450-2	2.7533-2	.68052	2.4094	.089951	9.000	.3832	9.706	6.470	1.377	.183929	.094929
3.0275	1.6263-2	2.5910-2	.67483	2.4256	.085769	9.500	.3805	9.929	6.564	1.386	.175229	.092925
3.0572	1.5241-2	2.4462-2	.66940	2.4407	.081990	10.000	.3779	10.141	6.654	1.395	.167331	.091083
3.1122	1.3480-2	2.1991-2	.65923	2.4682	.075375	11.000	.3734	10.542	6.818	1.413	.153555	.087786
3.1624	1.2052-2	1.9961-2	.64985	2.4926	.069777	12.000	.3694	10.916	6.967	1.429	.141928	.084915
3.2085	1.0873-2	1.8265-2	.64115	2.5143	.064975	13.000	.3659	11.260	7.102	1.445	.131975	.082384
3.2512	9.8846-3	1.6827-2	.63303	2.5343	.060811	14.000	.3628	11.600	7.226	1.460	.123560	.080129
3.2911	9.0498-3	1.5594-2	.62542	2.5524	.057162	15.000	.3600	11.913	7.340	1.475	.115828	.078097
3.3285	8.3236-3	1.4525-2	.61825	2.5690	.053957	16.000	.3575	12.216	7.446	1.489	.109166	.076252
3.3638	7.7039-3	1.3539-2	.61148	2.5843	.051066	17.000	.3552	12.503	7.545	1.503	.103273	.074569
3.3972	7.1557-3	1.2765-2	.60507	2.5985	.048495	18.000	.3531	12.776	7.637	1.516	.097969	.073026
3.4289	6.6750-3	1.2032-2	.59898	2.6116	.046177	19.000	.3511	13.043	7.724	1.529	.093229	.071598
3.4592	6.2408-3	1.1375-2	.59318	2.6241	.044076	20.000	.3493	13.290	7.806	1.541	.088921	.070274
3.4882	5.8667-3	1.0787-2	.58765	2.6357	.042162	21.000	.3476	13.545	7.883	1.553	.085002	.069042
3.5160	5.5277-3	1.0254-2	.58238	2.6466	.040412	22.000	.3461	13.784	7.957	1.565	.081425	.067887
3.5427	5.2203-3	9.7702-3	.57732	2.6569	.038806	23.000	.3446	14.014	8.026	1.577	.078137	.066810
3.5684	4.9420-3	9.3290-3	.57248	2.6666	.037525	24.000	.3432	14.257	8.093	1.588	.075111	.065795
3.5931	4.6890-3	8.9249-3	.56783	2.6759	.035950	25.000	.3419	14.455	8.156	1.599	.072316	.064840
3.6171	4.4530-3	8.5537-3	.56338	2.6846	.034566	26.000	.3407	14.666	8.216	1.610	.069726	.063934
3.6403	4.2463-3	8.2113-3	.55906	2.6930	.033350	27.000	.3395	14.872	8.274	1.620	.067321	.063078
3.6627	4.0522-3	7.8947-3	.55492	2.7009	.032404	28.000	.3384	15.072	8.329	1.630	.065078	.062266
3.6845	3.8730-3	7.6011-3	.55092	2.7085	.031373	29.000	.3374	15.268	8.383	1.640	.062963	.061495
3.7056	3.7075-3	7.3281-3	.54706	2.7158	.030410	30.000	.3364	15.458	8.434	1.650	.061021	.060756
3.7462	3.4116-3	6.8357-3	.53973	2.7294	.028655	32.000	.3345	15.827	8.531	1.669	.057449	.059365
3.7846	3.1552-3	6.4041-3	.53287	2.7420	.027092	34.000	.3328	16.179	8.621	1.687	.054266	.058129
3.8212	2.9311-3	6.0227-3	.52642	2.7537	.025695	36.000	.3312	16.518	8.705	1.704	.051446	.056972
3.8501	2.7358-3	5.6833-3	.52033	2.7645	.024439	38.000	.3298	16.843	8.785	1.721	.048903	.055903
3.8894	2.5569-3	5.3793-3	.51459	2.7747	.023302	40.000	.3284	17.156	8.859	1.738	.046602	.054909
3.9214	2.4029-3	5.1057-3	.50914	2.7842	.022269	42.000	.3272	17.456	8.930	1.753	.044511	.053965
3.9521	2.2650-3	4.8580-3	.50397	2.7932	.021325	44.000	.3260	17.750	8.996	1.769	.042603	.053116
3.9816	2.1369-3	4.6328-3	.49905	2.8016	.020459	46.000	.3249	18.033	9.060	1.784	.040854	.052306
4.0100	2.0229-3	4.4272-3	.49438	2.8096	.019663	48.000	.3239	18.307	9.120	1.798	.039247	.051542
4.0374	1.9192-3	4.2387-3	.48990	2.8171	.018927	50.000	.3229	18.573	9.177	1.812	.037762	.050822
4.1020	1.6973-3	3.8298-3	.47955	2.8345	.017312	55.000	.3206	19.207	9.311	1.845	.034500	.049165
4.1617	1.5172-3	3.4917-3	.47020	2.8498	.015955	60.000	.3187	19.801	9.430	1.877	.031778	.047745
4.2172	1.3685-3	3.2075-3	.46170	2.8636	.014800	65.000	.3169	20.360	9.539	1.906	.029454	.046463
4.2690	1.2439-3	2.9655-3	.45392	2.8761	.013802	70.000	.3153	20.889	9.639	1.934	.027451	.045313
4.3177	1.1381-3	2.7569-3	.44675	2.8876	.012934	75.000	.3139	21.391	9.731	1.960	.025767	.044272
4.3636	1.0473-3	2.5752-3	.44011	2.8980	.012169	80.000	.3126	21.873	9.816	1.986	.024174	.043323
4.4071	9.6655-4	2.4157-3	.43394	2.9077	.011491	85.000	.3113	22.326	9.896	2.010	.022817	.042453
4.4483	8.9980-4	2.2745-3	.42817	2.9166	.010886	90.000	.3102	22.767	9.970	2.033	.021606	.041653
4.4876	8.3936-4	2.1486-3	.42277	2.9250	.010343	95.000	.3092	23.186	10.040	2.055	.020518	.040908
4.5250	7.8571-4	2.0358-3	.41767	2.9327	.009852	100.000	.3082	23.594	10.105	2.077	.019536	.040219
4.5609	7.3767-4	1.9340-3	.41289	2.9400	.009406	105.000	.3073	23.985	10.168	2.097	.018645	.039574
4.5952	6.9497-4	1.8418-3	.40836	2.9469	.008999	110.000	.3065	24.364	10.226	2.117	.017833	.038971
4.6282	6.5632-4	1.7579-3	.40406	2.9534	.008627	115.000	.3057	24.731	10.282	2.137	.017090	.038403
4.6600	6.2133-4	1.6812-3	.39998	2.9593	.008285	120.000	.3049	25.085	10.335	2.155	.016407	.037871
4.6906	5.8952-4	1.6108-3	.39609	2.9653	.007969	125.000	.3042	25.430	10.385	2.173	.015776	.037367
4.7201	5.6049-4	1.5459-3	.39239	2.9706	.007677	130.000	.3035	25.765	10.434	2.191	.015194	.036889
4.7486	5.3391-4	1.4861-3	.38883	2.9758	.007405	135.000	.3029	26.090	10.480	2.208	.014653	.036437
4.7762	5.0949-4	1.4306-3	.38544	2.9810	.007155	140.000	.3022	26.408	10.525	2.225	.014150	.036007
4.8289	4.6620-4	1.3310-3	.37906	2.9904	.006697	150.000	.3011	27.020	10.609	2.257	.013242	.035205
4.8541	4.4693-4	1.2862-3	.37606	2.9947	.006490	155.000	.3006	27.314	10.648	2.273	.012831	.034833
4.8786	4.2903-4	1.2443-3	.37316	2.9989	.006296	160.000	.3000	27.603	10.686	2.288	.012445	.034474
4.9024	4.1237-4	1.2050-3	.37036	3.0030	.006114	165.000	.2996	27.884	10.723	2.302	.012082	.034132
4.9256	3.9683-4	1.1680-3	.36769	3.0068	.005942	170.000	.2991	28.160	10.758	2.317	.011739	.033803
4.9482	3.8229-4	1.1332-3	.36509	3.0106	.005779	175.000	.2986	28.429	10.792	2.331	.011416	.033488
4.9702	3.6867-4	1.1005-3	.36258	3.0142	.005625	180.000	.2982	28.690	10.826	2.345	.011111	.033182
4.9917	3.5589-4	1.0695-3	.36015	3.0176	.005480	185.000	.2978	28.955	10.858	2.359	.010821	.032890
5.0127	3.4388-4	1.0402-3	.35780	3.0210	.005341	190.000	.2973	29.209	10.889	2.372	.010546	.032609
5.0332	3.3257-4	1.0124-3	.35551	3.0242	.005210	195.000	.2970	29.458	10.919	2.385	.010285	.032337
5.0533	3.2190-4	9.8608-4	.35330	3.0274	.005085	200.000	.2966	29.705	10.949	2.398	.010037	.032072
5.0729	3.1183-4	9.6107-4	.35115	3.0304	.004965	205.000	.2962	29.946	10.978	2.411	.009800	.031813
5.0921	3.0230-4	9.3728-4	.34906	3.0333	.004852	210.000	.2958	30.182	11.005	2.423	.009573	.031573
5.1109	2.9328-4	9.1462-4	.34704	3.0362	.004744	215.000	.2955	30.416	11.033	2.435	.009360	.031334
5.1293	2.8472-4	8.9302-4	.34506	3.0390	.004640	220.000	.2952	30.646	11.060	2.447	.009155	.031102

TABLE II.- Continued

(c) Concluded

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
5.1474	2.7680-4	8.7240-4	.34314	3.0410	.003541	225.000	.2940	30.871	11.085	2.459	.008098	.010017
5.1651	2.6686-4	8.5279-4	.34127	3.0443	.004445	230.000	.2945	31.094	11.110	2.471	.006770	.033261
5.1824	2.6154-4	8.3397-4	.33945	3.0460	.004355	235.000	.2942	31.313	11.135	2.482	.006505	.035050
5.1995	2.5454-4	8.1583-4	.33767	3.0475	.004220	240.000	.2939	31.520	11.158	2.493	.006412	.033645

| 6.7051 | 3.0077-5 | 1.4911-4 | .21851 | 3.2094 | .000061 | 1250.000 | .2746 | 55.784 | 12.045 | 3.643 | .001066 | .017046 |

TABLE II.- Continued

(d) Product mixture D

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
0.0000	1.0000 0	1.0000 0	1.0000C	0.0000	0.000000	0.000						
.0249	9.99c5-1	9.9999-1	.99997	.0249	.00034s	24.000						
.0299	9.9990-1	9.9996-1	.99996	.0299	.000501	20.000						
.0341	9.999-1	9.9942-1	.99994	.0341	.000654	17.500						
.0398	9.991-1	9.9921-1	.99992	.0398	.000891	15.000						
.0478	9.9871-1	9.9886-1	.99989	.0478	.001283	12.500						
.0598	9.9799-1	9.9821-1	.9998_	.0598	.002006	10.000						
.0799	9.9642-1	9.9681-1	.99970	.0799	.003572	7.500						
.1203	9.9190-1	9.9279-1	.99931	.1203	.008065	5.000						
.1339	9.8997-1	9.9106-1	.99915	.1339	.009979	4.500						
.1511	9.8726-1	9.8860-1	.99892	.1510	.012660	4.000						
.1753	9.8328-1	9.8511-1	.99856	.1752	.016575	3.500						
.2034	9.7765-1	9.7955-1	.99805	.2032	.022715	3.000						
.2467	9.6646-1	9.7016-1	.99714	.2462	.03.001	2.500						
.2763	9.5821-1	9.6203-1	.99641	.2797	.041095	2.250						
.3146	9.4608-1	9.5106-1	.99538	.3136	.053590	2.000						
.3546	9.3209-1	9.3832-1	.99412	.3531	.065804	1.800						
.4074	9.1142-1	9.2070-1	.99223	.4053	.084961	1.600						
.4822	8.7842-1	8.9101-1	.98919	.4785	.114675	1.400						
.5357	8.5340-1	8.6836-1	.98681	.528?	.136463	1.300						
.5652	8.3732-1	8.5278-1	.98524	.5554	.150115	1.250						
.6021	8.1774-1	8.3396-1	.98370	.5952	.166360	1.200						
.6467	7.9317-1	8.1355-1	.98081	.6361	.186126	1.150						
.7054	7.6079-1	7.8068-1	.97742	.6924	.211130	1.100						
.7832	7.1341-1	7.4001-1	.97222	.7632	.245404	1.050						
.8435	6.7677-1	7.0621-1	.96799	.8248	.269916	1.025						
.9671	6.0068-1	6.3493-1	.95350	.9394	.313773	1.001						
1.0000	5.8053-1	6.1587-1	.95582	.9694	.323173	1.000						
1.0330	5.6040-1	5.9675-1	.95305	.9994	.334907	1.001	.9696	1.077	1.069	1.005	1.000192	.567797
1.1050	5.1710-1	5.5543-1	.94670	1.0640	.35.457	1.010	.9043	1.236	1.206	1.017	.998023	.517663
1.1493	4.9308-1	5.3050-1	.94276	1.1036	.26293s	1.020	.8706	1.340	1.299	1.024	.996751	.492584
1.1836	4.7116-1	5.1115-1	.93961	1.1741	.369801	1.030	.8462	1.425	1.371	1.029	.994979	.477968
1.2123	4.5466-1	4.9510-1	.93600	1.1590	.372984	1.040	.8269	1.490	1.434	1.033	.991083	.458750
1.2612	4.2792-1	4.6800-1	.93219	1.2060	.380680	1.060	.7964	1.625	1.541	1.040	.984272	.434707
1.3023	4.0528-1	4.4674-1	.92615	1.2275	.384533	1.080	.772?	1.736	1.634	1.046	.977012	.414811
1.3394	3.8625-1	4.2792-1	.92450	1.2644	.386781	1.100	.7528	1.837	1.737	1.052	.969917	.398499
1.4763	3.1717-1	3.5697-1	.90954	1.3660	.387423	1.200	.6941	2.257	2.054	1.071	.937370	.342231
1.5820	2.7152-1	3.1216-1	.89356	1.4710	.379204	1.300	.6445	2.590	2.219	1.086	.885077	.306773
1.6677	2.3767-1	2.7705-1	.88309	1.5247	.368802	1.400	.6147	2.943	2.543	1.097	.844653	.281380
1.7432	2.1135-1	2.4950-1	.87064	1.5903	.356927	1.500	.5918	3.144	2.736	1.107	.806789	.261946
1.8036	1.9615-1	2.2654-1	.87221	1.6453	.345480	1.600	.5733	3.332	2.913	1.116	.771646	.246422
1.8601	1.7269-1	2.0807-1	.86651	1.6874	.333047	1.700	.5580	3.601	3.071	1.124	.739128	.233647
1.9111	1.5603-1	1.9216-1	.86036	1.7361	.31169	1.800	.5450	3.804	3.216	1.131	.709051	.222897
1.9570	1.4337-1	1.7850-1	.80474	1.7804	.31079?	1.900	.5338	3.995	3.350	1.137	.681235	.213686
2.0004	1.3460-1	1.6664-1	.84901	1.8202	.307495	2.000	.5240	4.174	3.474	1.143	.655447	.205686
2.0400	1.2545-1	1.5614-1	.84463	1.8600	.296759	2.100	.5153	4.344	3.590	1.148	.631524	.198650
2.0768	1.1713-1	1.4670-1	.84006	1.8966	.286557	2.200	.5075	4.505	3.699	1.153	.609273	.192403
2.1113	1.0974-1	1.2074-1	.83576	1.9378	.27687?	2.300	.5005	4.658	3.801	1.158	.588526	.186813
2.1437	1.0246-1	1.3156-1	.83170	1.9807	.264679	2.400	.4941	4.804	3.899	1.163	.569177	.181764
2.1742	9.7619-2	1.2471-1	.82785	1.9150	.256947	2.500	.4883	4.944	3.993	1.167	.551070	.177182
2.2031	9.2397-2	1.1860-1	.82426	1.9343	.249627	2.600	.4829	5.078	4.075	1.171	.534091	.173000
2.2305	8.7600-2	1.1313-1	.82072	1.9537	.247713	2.700	.4780	5.207	4.163	1.175	.518162	.169156
2.2566	8.3516-2	1.031-1	.81740	1.9714	.27.016?	2.800	.4734	5.331	4.240	1.179	.503157	.165618
2.2814	7.9369-2	1.0353-1	.81422	1.9881	.229950	2.900	.4691	5.451	4.317	1.182	.489029	.162340
2.3051	7.5775-2	9.9309-2	.81117	2.0043	.224067	3.000	.4652	5.556	4.333	1.186	.475672	.159301
2.3496	6.9325-2	9.1751-2	.80544	2.0335	.211135	3.200	.4580	5.787	4.527	1.192	.451132	.153803
2.3907	6.3697-2	8.5227-2	.80013	2.0603	.200287	3.400	.4516	5.974	4.655	1.198	.429054	.149973
2.4287	5.8766-2	7.9554-2	.79516	2.0850	.19142?	3.600	.4453	6.189	4.773	1.204	.409087	.144687
2.4643	5.3064-2	7.4540-2	.7?050	2.1077	.180056	3.800	.4407	6.374	4.885	1.209	.390963	.140843
2.4974	5.1419-2	7.0127-2	.78415	2.1289	.17756?	4.000	.4360	6.550	4.939	1.214	.374431	.137379
2.5267	4.8213-2	6.6165-2	.7802_	2.1485	.17.56?	4.200	.4317	6.717	5.086	1.218	.359262	.134227
2.5561	4.5515-2	6.2624-2	.77613	2.1604	.16815?	4.400	.4277	6.877	5.191	1.223	.345332	.131351
2.5860	4.2710-2	5.9420-2	.7744_	2.1349	.159262	4.600	.4241	7.031	5.270	1.227	.332462	.128706
2.6125	4.0476-2	5.6510-2	.77069	2.2002	.157746	4.800	.4207	7.178	5.354	1.231	.320561	.126267
2.6377	3.8346-2	5.3866-2	.76752	2.2159	.146679	5.000	.4175	7.320	5.435	1.235	.309497	.124008
2.6957	3.3642-2	4.7490-2	.75772	2.2504	.132244	5.500	.4105	7.652	5.620	1.244	.285031	.119011
2.7478	3.0027-2	4.2622-2	.75103	2.2411	.11750?	6.000	.4045	7.957	5.790	1.252	.264260	.114763
2.7952	2.7076-2	3.4700-2	.74670	2.3060	.11 11?	6.500	.3992	8.239	5.941	1.260	.246394	.111090

TABLE II.- Continued

(d) Continued

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
2.8384	2.4954-2	3.6552-2	.74128	2.3334	.111415	7.000	.3545	4.5.3	4.531	1.257	.230065	.107972
2.8785	2.4214-2	3.5733-2	.7474.	2.3594	.107537	7.500	.3524	4.749	4.736	1.274	.217237	.105022
2.9193	2.1024-2	2.1401-2	.74462	2.3760	.104553	8.000	.3467	3.691	4.930	1.290	.205169	.102472
2.9497	1.9547-2	2.7225-2	.7343	2.3557	.094454	8.500	.3433	5.231	6.442	1.296	.194420	.100171
2.9820	1.8125-2	2.7434-2	.77020	2.4133	.091941	9.000	.3492	5.420	5.947	1.312	.184765	.098085
3.0123	1.6952-2	2.5060-2	.71601	2.4297	.085741	9.500	.3772	5.608	6.542	1.297	.176050	.096175
3.0408	1.5678-2	2.4418-2	.71155	2.4451	.082016	10.000	.3747	5.797	5.738	1.303	.168157	.094422
3.0935	1.4043-2	2.1948-2	.70441	2.4729	.075409	11.000	.3700	6.152	6.910	1.312	.154570	.091207
3.1412	1.2644-2	1.9919-2	.69753	2.4977	.068819	12.000	.3659	6.490	7.365	1.322	.142726	.088551
3.1847	1.1446-2	1.8224-2	.69119	2.5200	.065025	13.000	.3623	6.785	7.237	1.353	.132762	.085213
3.2247	1.0440-2	1.6733-2	.68529	2.5403	.060563	14.000	.3591	7.457	7.457	1.338	.124152	.084100
3.2617	9.5817-3	1.5556-2	.67779	2.5587	.05721	15.000	.3563	7.447	7.497	1.346	.116596	.092203
3.2962	8.8470-3	1.4457-2	.67462	2.5757	.054047	16.000	.3537	7.570	7.570	1.353	.109934	.090483
3.3284	8.2006-3	1.3552-2	.66975	2.5914	.051117	17.000	.3511	7.654	7.674	1.360	.104011	.078921
3.3587	7.6419-3	1.2718-2	.6634	2.6003	.04954	18.000	.3484	7.695	7.772	1.367	.098713	.077466
3.3873	7.1249-3	1.1975-2	.66077	2.6130	.04605	19.000	.3464	7.452	7.445	1.374	.093347	.076109
3.4143	6.7511-3	1.1340-2	.65607	2.6324	.0441	20.000	.3456	7.450	7.450	1.330	.089625	.074636
3.4399	6.3465-3	1.3751-2	.65267	2.6444	.0422.5	21.000	.3437	12.463	8.058	1.366	.085597	.073794
3.4643	5.9714-3	1.0214-2	.64874	2.6557	.04043	22.000	.3415	12.444	8.113	1.392	.082102	.072732
3.4876	5.6310-3	9.7255-3	.64502	2.6665	.03566	23.000	.340	13.76	8.134	1.398	.078907	.071730
3.5099	5.3141-3	7.254-3	.64112	2.6765	.0374.	24.000	.3340	13.465	8.162	1.413	.075778	.070789
3.5311	5.0130-3	3.6946-3	.63715	2.6815	.0360	25.000	.3370	14.563	8.157	1.409	.072377	.069904
3.5516	4.7614-3	3.2175-3	.63345	2.6873	.03477	26.000	.335	13.592	8.135	1.414	.073374	.069065
3.5712	4.6013-3	8.6277-3	.62972	2.6719	.03344	27.000	.3349	13.767	8.175	1.410	.067549	.069270
3.5902	4.4303-3	7.2236-3	.62635	2.7123	.0326	28.000	.3339	14.057	8.247	1.425	.065704	.067515
3.6084	4.2408-3	7.6693-3	.62554	2.7023	.0314	29.000	.3327	14.213	8.271	1.430	.063605	.066796
3.6261	4.0747-3	7.2175-3	.62120	2.7273	.05911	30.000	.3315	14.245	8.164	1.435	.061636	.066110
3.6595	3.7603-3	6.4565-3	.61745	2.7452	.02875	32.000	.3293	14.727	8.174	1.444	.098044	.064827
3.6912	3.4451-3	6.2175-3	.61117	2.7735	.01771	34.000	.3275	14.606	8.254	1.454	.054866	.063645
3.7213	3.2540-3	5.7445-3	.60674	2.7650	.02475	36.000	.3259	15.273	8.325	1.463	.052001	.062559
3.7499	3.0440-3	5.6020-3	.60271	2.7770	.02455	38.000	.3242	15.520	8.514	1.472	.049463	.061547
3.7761	2.8575-3	5.2435-3	.59773	2.7704	.02234	40.000	.3228	15.776	8.554	1.449	.047149	.060605
3.8017	2.6950-3	5.1757-3	.59447	2.8000	.02114	42.000	.3214	16.014	8.174	1.449	.045047	.059722
3.8292	2.5030-3	4.3335-3	.58963	2.8103	.021424	44.000	.3202	16.345	9.204	1.447	.043128	.058892
3.8497	2.4040-3	4.6235-3	.58642	2.8144	.02055	46.000	.3130	16.767	9.314	1.505	.041373	.058110
3.8723	2.2645-3	4.4952-3	.58220	2.8250	.01873	48.000	.3170	16.464	9.377	1.513	.039792	.057771
3.8940	2.1510-3	4.2103-3	.57966	2.8355	.01607	50.000	.3164	16.800	9.471	1.521	.038258	.056672
3.9452	1.9544-3	3.9920-3	.57277	2.8051	.01747	55.000	.3144	17.133	9.663	1.539	.034981	.055071
3.9924	1.7261-3	3.4647-3	.57170	2.8723	.0156	60.000	.3122	17.601	9.730	1.557	.032231	.053647
4.0364	1.5010-3	2.7512-3	.5630	2.3072	.01490	65.000	.3107	14.107	9.835	1.574	.029893	.052368
4.0777	1.4075-3	1.3225-3	.5644C	2.9111	.01491	70.000	.3036	14.727	9.975	1.591	.027668	.051210
4.1180	1.3045-3	2.7725-3	.5513	2.9158	.01425	75.000	.3070	19.528	10.078	1.607	.026122	.050153
4.1555	1.2420-3	2.5510-3	.5511	2.9155	.0132	80.000	.3056	14.311	10.170	1.632	.024562	.049183
4.1855	1.1175-3	2.3575-3	.55247	2.9753	.01335	85.000	.3043	19.673	10.257	1.637	.023190	.048287
4.2220	1.0645-3	2.2214-3	.55024	2.9464	.0139	90.000	.3030	20.030	10.371	1.651	.021168	.047457
4.2541	9.7465-4	2.0555-3	.5449	2.5729	.01104	95.000	.3016	20.370	10.459	1.665	.020360	.046685
4.2849	9.1245-4	2.0225-3	.54363	2.9647	.01063	100.000	.3002	20.636	10.550	1.670	.019076	.045965
4.3144	8.6574-4	1.9235-3	.54212	2.9770	.03497	105.000	.263	21.013	10.610	1.692	.018176	.045297
4.3469	8.1045-4	1.8095-3	.54055	2.9603	.0089	110.000	.2973	21.316	10.640	1.704	.019154	.044652
4.3733	7.6550-4	1.7275-3	.44100	2.9941	.01075	115.000	.2981	21.615	10.715	1.717	.017402	.044052
4.3969	7.2455-4	1.6511-3	.44175	2.9552	.00637	120.000	.2972	21.902	10.775	1.729	.016710	.043488
4.4225	6.4565-4	1.4525-3	.46777	3.0012	.00790	125.000	.2964	22.191	10.834	1.743	.016072	.042951
4.4474	6.5575-4	1.5255-3	.46579	3.0041	.00776	130.000	.2957	22.453	10.861	1.752	.015483	.042441
4.4715	6.2625-4	1.4273-3	.46416	3.0041	.0074	135.000	.2950	22.717	10.945	1.763	.014935	.041958
4.4949	5.6565-4	1.4132-4	.4766	3.0194	.03720	140.000	.2943	22.975	10.996	1.774	.014425	.041497
4.5358	5.4370-4	1.3134-3	.46360	3.0238	.00636	150.000	.2931	23.470	11.034	1.793	.013504	.040628
4.5613	5.2605-4	1.2695-3	.46000	3.0536	.0655	155.000	.2923	23.710	11.140	1.803	.013088	.040235
4.5822	5.0505-4	1.1275-3	.45360	3.0401	.00737	160.000	.2919	23.944	11.135	1.815	.012695	.039849
4.6027	4.8605-4	1.1983-3	.45060	3.0455	.00631	165.000	.2911	24.175	11.226	1.824	.012327	.039481
4.6226	4.6371-4	1.1515-3	.45773	3.0476	.00017	170.000	.2909	24.395	11.270	1.834	.011980	.039125
4.6420	4.5105-4	1.1171-3	.45464	3.0540	.00585	175.000	.2904	24.615	11.310	1.843	.011652	.038783
4.6610	4.3625-4	1.0546-3	.45224	3.0551	.00554	180.000	.2399	24.830	11.349	1.852	.011342	.038454
4.6796	4.4211-4	1.0737-3	.44931	3.0626	.00552	185.000	.2894	25.040	11.367	1.861	.011048	.038136
4.6977	4.0737-4	1.0456-3	.44766	3.0561	.00341	190.000	.2890	25.246	11.424	1.870	.010769	.037831
4.7154	3.9345-4	9.7736-4	.44459	3.0695	.00226	195.000	.2885	25.449	11.460	1.879	.010504	.037534
4.7328	2.6125-4	9.7129-4	.44219	3.0733	.00512	200.000	.2881	25.648	11.494	1.887	.010251	.037249
4.7498	3.7014-4	9.4655-4	.43985	3.0770	.00325	205.000	.2877	25.843	11.528	1.896	.010011	.036971
4.7665	3.5930-4	9.2243-4	.43727	3.0804	.00492	210.000	.2873	26.025	11.561	1.904	.009782	.036704
4.7823	3.4875-4	8.9030-4	.42536	3.0834	.00431	215.000	.2469	26.224	11.593	1.912	.009564	.036444
4.7998	3.3626-4	8.7511-4	.43320	3.0870	.00474	220.000	.2466	26.409	11.624	1.920	.009355	.036193

TABLE II.- Continued

(d) Concluded

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
4.8145	3.292₋₄	5.5670₋₄	.43105	3.0903	.004697	225.000	.2367	26.592	11.655	1.928	.009155	.033948
4.8299	3.2616₋₄	6.5520₋₄	.42904	3.0930	.004511	230.000	.2360	26.771	11.684	1.935	.008964	.035711
4.8450	3.1113₋₄	6.2636₋₄	.42704	3.1062	.004411	235.000	.2355	26.948	11.713	1.943	.008780	.035491
4.8599	3.0276₋₄	6.0270₋₄	.42500	3.0990	.004331	240.000	.2352	27.122	11.742	1.950	.008604	.035257
4.8744	2.9550₋₄	7.1562₋₄	.42310	3.1019	.004247	245.000	.2349	27.293	11.769	1.959	.008435	.035040
4.8888	2.8612₋₄	7.0925₋₄	.42131	3.1048	.004165	250.000	.2845	27.462	11.796	1.965	.008273	.034828
4.9029	2.8110₋₄	7.5149₋₄	.41949	3.1075	.004067	255.000	.2842	27.629	11.823	1.972	.008117	.034621
4.9167	2.7420₋₄	7.3636₋₄	.41771	3.1098	.004017	260.000	.2339	27.793	11.848	1.979	.007966	.034420
4.9303	2.6768₋₄	7.2266₋₄	.41598	3.1126	.003941	265.000	.2837	27.955	11.874	1.946	.007821	.034224
4.9437	2.6142₋₄	7.0966₋₄	.41426	3.1146	.003870	270.000	.2834	28.115	11.899	1.993	.007682	.034032
4.9569	2.5544₋₄	6.9643₋₄	.41259	3.1174	.003802	275.000	.2831	28.272	11.923	1.999	.007547	.033846
4.9699	2.4970₋₄	6.8348₋₄	.41095	3.1197	.003737	280.000	.2828	28.427	11.946	2.006	.007417	.033664
4.9827	2.4418₋₄	6.7093₋₄	.40935	3.1221	.003675	285.000	.2826	28.581	11.970	2.013	.007292	.033486
4.9953	2.3887₋₄	6.5894₋₄	.40778	3.1244	.003614	290.000	.2823	28.732	11.993	2.019	.007171	.033313
5.0077	2.3377₋₄	6.4731₋₄	.40624	3.1266	.003555	295.000	.2820	28.882	12.015	2.025	.007053	.033142
5.0199	2.2886₋₄	6.3608₋₄	.40472	3.1288	.003495	300.000	.2818	29.030	12.037	2.032	.006940	.032976
5.0438	2.1957₋₄	6.1475₋₄	.40177	3.1330	.003347	310.000	.2813	29.320	12.080	2.044	.006724	.032654
5.0671	2.1094₋₄	5.9475₋₄	.39896	3.1370	.003234	320.000	.2809	29.604	12.121	2.056	.006521	.032346
5.0897	2.0295₋₄	5.7601₋₄	.39622	3.1409	.003131	330.000	.2804	29.882	12.161	2.068	.006330	.032050
5.1117	1.9530₋₄	5.5840₋₄	.39359	3.1447	.003020	340.000	.2800	30.153	12.200	2.080	.006151	.031766
5.1352	1.8515₋₄	5.4103₋₄	.39134	3.1480	.003017	350.000	.2796	30.418	12.237	2.091	.005981	.031493
5.1542	1.8176₋₄	5.2615₋₄	.38856	3.1516	.003937	360.000	.2792	30.679	12.273	2.102	.005820	.031230
5.1748	1.7516₋₄	5.1142₋₄	.38616	3.1551	.002765	370.000	.2789	30.935	12.309	2.113	.005668	.030976
5.1945	1.6910₋₄	4.9743₋₄	.38397	3.1584	.002774	380.000	.2784	31.185	12.342	2.124	.005524	.030732
5.2141	1.6347₋₄	4.8420₋₄	.38162	3.1616	.002716	390.000	.2781	31.429	12.375	2.134	.005387	.030499
5.2332	1.5910₋₄	4.7165₋₄	.37949	3.1646	.002624	400.000	.2777	31.670	12.408	2.144	.005257	.030266
5.2702	1.4950₋₄	4.4837₋₄	.37535	3.1704	.002524	420.000	.2771	32.138	12.469	2.164	.005014	.029831
5.3056	1.4113₋₄	4.2725₋₄	.37133	3.1759	.002451	440.000	.2765	32.591	12.528	2.184	.004793	.029423
5.3396	1.3352₋₄	4.0801₋₄	.36756	3.1811	.002330	460.000	.2759	33.029	12.583	2.202	.004591	.029037
5.3724	1.2654₋₄	3.9043₋₄	.36402	3.1860	.002226	480.000	.2753	33.454	12.636	2.220	.004406	.028674
5.4040	1.1550₋₄	3.7425₋₄	.36061	3.1903	.002140	500.000	.2748	33.867	17.687	2.238	.004235	.028329
5.4420	1.1279₋₄	3.5552₋₄	.35660	3.1961	.002040	525.000	.2742	34.365	12.747	2.259	.004039	.027924
5.4784	1.0635₋₄	3.3910₋₄	.35280	3.2012	.001950	550.000	.2736	34.847	12.804	2.280	.003861	.027542
5.5134	1.0053₋₄	3.2386₋₄	.34919	3.2061	.001870	575.000	.2730	35.314	12.859	2.300	.003698	.027183
5.5471	9.5255₋₅	3.0992₋₄	.34575	3.2107	.001795	600.000	.2725	35.765	12.910	2.319	.003548	.026844
5.6109	8.6074₋₅	2.8592₋₄	.33937	3.2193	.001661	650.000	.2715	36.631	13.006	2.356	.003283	.026217
5.6706	7.8362₋₅	2.6420₋₄	.33353	3.2272	.001549	700.000	.2707	37.449	13.095	2.390	.003055	.025651
5.7266	7.1607₋₅	2.4614₋₄	.32816	3.2341	.001447	750.000	.2699	38.223	13.177	2.423	.002857	.025136
5.7795	6.5167₋₅	2.3090₋₄	.32320	3.2406	.001359	800.000	.2691	38.970	13.251	2.455	.002683	.024662
5.8295	6.1271₋₅	2.1635₋₄	.31858	3.2466	.001281	850.000	.2684	39.690	13.324	2.485	.002529	.024226
5.8771	5.6597₋₅	2.0039₋₄	.31428	3.2522	.001212	900.000	.2678	40.361	13.390	2.514	.002392	.023822
5.9656	4.9865₋₅	1.8101₋₄	.30643	3.2623	.001044	1000.000	.2669	41.646	13.511	2.568	.002159	.023095
6.0072	4.6852₋₅	1.7456₋₄	.30767	3.2669	.001044	1050.000	.2661	42.255	13.569	2.594	.002058	.022765
6.0470	4.4174₋₅	1.6593₋₄	.29947	3.2712	.001099	1100.000	.2655	42.843	13.620	2.619	.001967	.022457
6.0852	4.1706₋₅	1.5831₋₄	.29526	3.2730	.000969	1150.000	.2652	43.414	13.670	2.643	.001884	.022155
6.1220	3.9516₋₅	1.5173₋₄	.27706	3.2741	.000917	1200.000	.2647	43.968	13.714	2.666	.001807	.021838
6.1575	3.7523₋₅	1.4550₋₄	.27039	3.2477	.000871	1250.000	.2643	44.505	13.765	2.633	.001736	.021626

TABLE II.- Continued

(e) Product mixture E

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
0.0000	1.0000 0	1.0000 0	1.00000	0.0000	0.000000	0.000						
.0249	9.9965-1	9.9969-1	.99997	.0249	.000348	24.030						
.0299	9.9950-1	9.9955-1	.99996	.0299	.000501	20.000						
.0341	9.9934-1	9.9942-1	.99995	.0341	.000654	17.500						
.0398	9.9911-1	9.9921-1	.99993	.0398	.000890	15.000						
.0478	9.9871-1	9.9886-1	.99990	.0478	.001282	12.500						
.0598	9.9799-1	9.9822-1	.99983	.0599	.002005	10.000						
.0799	9.9642-1	9.9682-1	.99971	.0799	.003570	7.500						
.1203	9.9190-1	9.9279-1	.99933	.1203	.008065	5.000						
.1339	9.8998-1	9.9108-1	.99917	.1339	.009974	4.500						
.1511	9.8727-1	9.8866-1	.99894	.1510	.012654	4.000						
.1733	9.8329-1	9.8511-1	.99861	.1732	.016587	3.500						
.2034	9.7706-1	9.7955-1	.99809	.2032	.022703	3.000						
.2467	9.6648-1	9.7010-1	.99719	.2462	.033013	2.500						
.2763	9.5813-1	9.6263-1	.99648	.2756	.041073	2.250						
.3146	9.4611-1	9.5187-1	.99545	.3136	.053571	2.000						
.3545	9.3212-1	9.3933-1	.99423	.3531	.065770	1.800						
.4074	9.1147-1	9.2076-1	.99240	.4053	.084918	1.600						
.4822	8.7849-1	8.9101-1	.98941	.4784	.114615	1.400						
.5337	8.5348-1	8.6837-1	.98707	.5289	.136394	1.300						
.5652	8.3741-1	8.5378-1	.98554	.5594	.150036	1.250						
.6021	8.1794-1	8.3597-1	.98364	.5951	.165274	1.200						
.6467	7.9328-1	8.1355-1	.98120	.6341	.186037	1.150						
.7034	7.6092-1	7.8389-1	.97738	.6924	.211019	1.100						
.7832	7.1355-1	7.4022-1	.97279	.7642	.245272	1.050						
.8435	6.7694-1	7.0621-1	.96865	.8248	.267773	1.025						
.9671	6.0089-1	6.3493-1	.95940	.9393	.314602	1.001						
1.0000	5.8075-1	6.1598-1	.95678	.9694	.325003	1.000						
1.0330	5.6043-1	5.9678-1	.95418	.9994	.334726	1.001	.9592	1.081	1.073	1.005	1.000425	.560397
1.1050	5.1736-1	5.5543-1	.94798	1.0642	.153275	1.010	.9031	1.237	1.210	1.016	.999104	.517824
1.1493	4.9125-1	5.3030-1	.94408	1.1037	.162794	1.020	.8698	1.342	1.301	1.023	.996925	.492766
1.1836	4.7144-1	5.1113-1	.94099	1.1340	.369131	1.030	.8456	1.425	1.373	1.028	.994255	.474160
1.2125	4.5494-1	4.9510-1	.93834	1.1595	.373785	1.040	.8263	1.498	1.435	1.032	.991249	.458960
1.2612	4.2782-1	4.6800-1	.93379	1.2020	.383167	1.060	.7959	1.625	1.543	1.039	.984532	.434538
1.3023	4.0559-1	4.4674-1	.92986	1.2374	.384140	1.080	.7721	1.736	1.636	1.045	.977175	.415056
1.3384	3.8655-1	4.2792-1	.92634	1.2684	.386584	1.100	.7524	1.837	1.719	1.050	.969376	.398760
1.4783	3.1772-1	3.5497-1	.91222	1.3860	.387228	1.200	.6858	2.252	2.056	1.069	.927537	.342539
1.5825	2.7199-1	3.1215-1	.90123	1.4712	.379431	1.300	.6442	2.589	2.321	1.083	.885270	.307111
1.6675	2.3903-1	2.7705-1	.89201	1.5393	.363621	1.400	.6144	2.880	2.545	1.094	.844846	.281750
1.7430	2.1171-1	2.4936-1	.88399	1.5961	.354754	1.500	.5914	3.141	2.741	1.103	.807012	.262334
1.8033	1.9052-1	2.2683-1	.87787	1.6450	.344705	1.600	.5729	3.378	2.917	1.111	.771881	.246832
1.8598	1.7307-1	2.0906-1	.87045	1.6880	.332892	1.700	.5576	3.534	3.075	1.118	.739362	.234080
1.9108	1.5842-1	1.9215-1	.86640	1.7262	.321512	1.800	.5446	3.798	3.221	1.124	.709311	.223343
1.9572	1.4594-1	1.7848-1	.85923	1.7605	.313659	1.900	.5333	3.998	3.355	1.130	.681485	.214154
1.9999	1.3519-1	1.6660-1	.85425	1.7918	.303367	2.000	.5235	4.166	3.479	1.136	.655710	.206170
2.0395	1.2592-1	1.5617-1	.84962	1.8204	.290635	2.100	.5148	4.315	3.596	1.141	.631801	.199147
2.0763	1.1787-1	1.4694-1	.84528	1.8468	.281443	2.200	.5070	4.495	3.705	1.145	.609550	.192917
2.1107	1.1031-1	1.3872-1	.84121	1.8712	.272767	2.300	.4999	4.647	3.808	1.150	.588822	.187338
2.1430	1.0387-1	1.3134-1	.83738	1.8940	.264580	2.400	.4935	4.792	3.906	1.154	.569462	.182307
2.1735	9.7997-2	1.2469-1	.83375	1.9162	.256865	2.500	.4877	4.930	3.998	1.158	.551359	.177738
2.2023	9.2752-2	1.1866-1	.83031	1.9352	.249537	2.600	.4823	5.064	4.086	1.161	.534404	.173562
2.2296	8.8002-2	1.1317-1	.82703	1.9539	.242628	2.700	.4774	5.191	4.169	1.165	.518452	.169740
2.2556	8.3691-2	1.0814-1	.82392	1.9717	.236082	2.800	.4728	5.314	4.249	1.168	.503452	.166215
2.2804	7.9735-2	1.0354-1	.82094	1.9884	.229883	2.900	.4685	5.433	4.326	1.171	.489323	.162950
2.3040	7.6118-2	9.9290-2	.81809	2.0043	.223597	3.000	.4645	5.547	4.359	1.174	.475996	.155913
2.3484	6.9722-2	9.1732-2	.81273	2.0339	.213050	3.200	.4573	5.765	4.538	1.180	.451446	.154443
2.3893	6.4249-2	8.5209-2	.80778	2.0608	.203243	3.400	.4509	5.970	4.666	1.185	.429373	.149634
2.4272	5.9515-2	7.9527-2	.80318	2.0855	.194221	3.600	.4451	6.162	4.786	1.190	.409414	.145367
2.4626	5.5385-2	7.4523-2	.79888	2.1083	.186009	3.800	.4399	6.345	4.898	1.194	.391288	.141545
2.4956	5.1754-2	7.0097-2	.79485	2.1294	.178485	4.000	.4352	6.518	5.003	1.198	.374759	.138101
2.5268	4.8533-2	6.6145-2	.79105	2.1491	.171550	4.200	.4309	6.683	5.103	1.202	.359592	.134968
2.5561	4.5665-2	6.2605-2	.78746	2.1674	.165158	4.400	.4269	6.841	5.197	1.206	.345659	.132111
2.5839	4.3091-2	5.9404-2	.78407	2.1847	.159230	4.600	.4232	6.992	5.286	1.210	.332790	.129485
2.6102	4.0774-2	5.5513-2	.78084	2.2009	.153731	4.800	.4198	7.136	5.371	1.213	.320889	.127064
2.6352	3.8673-2	5.3397-2	.77777	2.2163	.149611	5.000	.4167	7.275	5.452	1.216	.309826	.124822
2.6929	3.4205-2	4.8219-2	.77063	2.2512	.137228	5.500	.4096	7.601	5.640	1.224	.285354	.119870
2.7447	3.0602-2	4.3604-2	.76431	2.2821	.127518	6.000	.4035	7.899	5.809	1.230	.264580	.115663
2.7917	2.7639-2	3.9768-2	.75852	2.3057	.119131	6.500	.3982	8.174	5.963	1.237	.246714	.112028

TABLE II.- Continued

(e) Continued

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
2.8347	2.5164-2	3.6634-2	.75322	2.3345	.111813	7.000	.3935	8.430	6.105	1.242	.231181	.108848
2.8742	2.3068-2	3.3771-2	.74833	2.3572	.105371	7.500	.3894	8.670	6.235	1.247	.217550	.106033
2.9109	2.1271-2	3.1384-2	.74379	2.3779	.099655	8.000	.3856	8.895	6.357	1.252	.205486	.103518
2.9450	1.9717-2	2.9302-2	.73956	2.3970	.094546	8.500	.3822	9.107	6.470	1.257	.194727	.101254
2.9769	1.8359-2	2.7471-2	.73561	2.4147	.089954	9.000	.3791	9.309	6.576	1.261	.185078	.099198
3.0069	1.7164-2	2.5849-2	.73188	2.4312	.085800	9.500	.3762	9.499	6.676	1.265	.176363	.097324
3.0352	1.6105-2	2.4402-2	.72837	2.4466	.082027	10.000	.3735	9.681	6.770	1.269	.168462	.095601
3.0872	1.4313-2	2.1933-2	.72189	2.4746	.075424	11.000	.3688	10.021	6.944	1.276	.154665	.092541
3.1343	1.2856-2	1.9904-2	.71601	2.4996	.069835	12.000	.3647	10.334	7.102	1.283	.143019	.089893
3.1772	1.1652-2	1.8210-2	.71065	2.5220	.065041	13.000	.3610	10.623	7.246	1.289	.133045	.087576
3.2166	1.0640-2	1.6774-2	.70571	2.5424	.060884	14.000	.3577	10.893	7.378	1.295	.124413	.085518
3.2530	9.7785-3	1.5542-2	.70113	2.5609	.057240	15.000	.3548	11.146	7.501	1.300	.116866	.083673
3.2869	9.0378-3	1.4474-2	.69686	2.5781	.054022	16.000	.3521	11.384	7.615	1.305	.110202	.082011
3.3186	8.3943-3	1.3539-2	.69286	2.5939	.051155	17.000	.3496	11.609	7.722	1.310	.104279	.080499
3.3483	7.8306-3	1.2715-2	.68910	2.6086	.048588	18.000	.3474	11.822	7.822	1.314	.098975	.079117
3.3762	7.3329-3	1.1983-2	.68555	2.6223	.046272	19.000	.3453	12.025	7.917	1.319	.094204	.077841
3.4026	6.8906-3	1.1328-2	.68219	2.6352	.044174	20.000	.3434	12.219	8.006	1.323	.089880	.076645
3.4277	6.4951-3	1.0739-2	.67900	2.6473	.042264	21.000	.3416	12.405	8.091	1.327	.085490	.075569
3.4515	6.1395-3	1.0207-2	.67596	2.6586	.040516	22.000	.3399	12.582	8.171	1.330	.082354	.074552
3.4741	5.8184-3	9.7241-3	.67305	2.6694	.038912	23.000	.3383	12.753	8.248	1.334	.079057	.073598
3.4958	5.5269-3	9.2834-3	.67021	2.6796	.037433	24.000	.3368	12.917	8.321	1.337	.076019	.072705
3.5165	5.2612-3	8.8799-3	.66760	2.6893	.036066	25.000	.3354	13.075	8.390	1.341	.073211	.071864
3.5363	5.0182-3	8.5091-3	.66504	2.6986	.034798	26.000	.3341	13.228	8.457	1.344	.070611	.071068
3.5553	4.7951-3	8.1673-3	.66257	2.7074	.033618	27.000	.3328	13.376	8.522	1.347	.068193	.070316
3.5735	4.5896-3	7.8512-3	.66019	2.7158	.032519	28.000	.3316	13.519	8.584	1.350	.065940	.069603
3.5913	4.3998-3	7.5580-3	.65790	2.7239	.031491	29.000	.3305	13.657	8.643	1.353	.063834	.068926
3.6083	4.2240-3	7.2854-3	.65568	2.7316	.030528	30.000	.3294	13.792	8.701	1.356	.061862	.068281
3.6405	3.9087-3	6.7938-3	.65144	2.7462	.028772	32.000	.3274	14.050	8.809	1.362	.058271	.067078
3.6707	3.6342-3	6.3629-3	.64746	2.7597	.027213	34.000	.3255	14.294	8.911	1.367	.055084	.065976
3.6991	3.3933-3	5.9822-3	.64370	2.7723	.025818	36.000	.3238	14.526	9.007	1.372	.052235	.064962
3.7259	3.1802-3	5.6434-3	.64012	2.7840	.024563	38.000	.3222	14.748	9.097	1.377	.049673	.064023
3.7512	2.9905-3	5.3401-3	.63673	2.7950	.023427	40.000	.3207	14.960	9.183	1.382	.047356	.063150
3.7753	2.8207-3	5.0670-3	.63348	2.8054	.022394	42.000	.3193	15.163	9.264	1.387	.045251	.062335
3.7982	2.6678-3	4.8198-3	.63038	2.8152	.021451	44.000	.3180	15.358	9.341	1.391	.043329	.061571
3.8201	2.5295-3	4.5951-3	.62740	2.8245	.020586	46.000	.3167	15.547	9.414	1.395	.041567	.060853
3.8409	2.4033-3	4.3900-3	.62454	2.8333	.019795	48.000	.3156	15.728	9.484	1.400	.039946	.060177
3.8609	2.2892-3	4.2019-3	.62179	2.8417	.019055	50.000	.3145	15.903	9.551	1.404	.038450	.059536
3.9075	2.0424-3	3.7942-3	.61531	2.8610	.017440	55.000	.3119	16.317	9.707	1.413	.035167	.058077
3.9500	1.8404-3	3.4571-3	.60934	2.8783	.016083	60.000	.3097	16.702	9.849	1.423	.032141	.056783
3.9889	1.6722-3	3.1739-3	.60378	2.8939	.014927	65.000	.3077	17.062	9.978	1.432	.030063	.055624
4.0250	1.5302-3	2.9327-3	.59854	2.9082	.013929	70.000	.3059	17.491	10.098	1.440	.028039	.054575
4.0585	1.4088-3	2.7240-3	.59369	2.9213	.013059	75.000	.3043	17.721	10.208	1.448	.026275	.053619
4.0898	1.3040-3	2.5441-3	.58907	2.9334	.012294	80.000	.3028	18.026	10.312	1.456	.024725	.052740
4.1193	1.2175-3	2.3853-3	.58468	2.9447	.011615	85.000	.3014	18.316	10.408	1.464	.023350	.051929
4.1471	1.1321-3	2.2448-3	.58049	2.9551	.011008	90.000	.3001	18.593	10.499	1.471	.022123	.051175
4.1734	1.0610-3	2.1196-3	.57649	2.9650	.010464	95.000	.2989	18.860	10.585	1.478	.021021	.050472
4.1984	9.9752-4	1.9762-3	.57266	2.9742	.009971	100.000	.2978	19.116	10.665	1.486	.020025	.049814
4.2222	9.4066-4	1.8826-3	.56898	2.9829	.009524	105.000	.2967	19.364	10.742	1.492	.019121	.049196
4.2450	8.8943-4	1.8146-3	.56563	2.9911	.009117	110.000	.2958	19.603	10.815	1.499	.018297	.048611
4.2668	8.4304-4	1.7312-3	.56201	2.9989	.008743	115.000	.2948	19.834	10.885	1.506	.017542	.048059
4.2877	8.0086-4	1.6550-3	.55871	3.0063	.008399	120.000	.2940	20.059	10.951	1.512	.016848	.047535
4.3079	7.6235-4	1.5851-3	.55552	3.0133	.008082	125.000	.2931	20.277	11.015	1.519	.016208	.047037
4.3272	7.2707-4	1.5207-3	.55247	3.0200	.007788	130.000	.2923	20.489	11.076	1.525	.015615	.046562
4.3460	6.9463-4	1.4613-3	.54942	3.0264	.007516	135.000	.2916	20.694	11.134	1.531	.015065	.046111
4.3641	6.6472-4	1.4062-3	.54650	3.0325	.007262	140.000	.2909	20.897	11.191	1.537	.014553	.045675
4.3988	6.1140-4	1.3075-3	.54091	3.0440	.006804	150.000	.2895	21.285	11.297	1.549	.013629	.044862
4.4153	5.8755-4	1.2631-3	.53822	3.0495	.006596	155.000	.2889	21.472	11.347	1.555	.013209	.044480
4.4315	5.6533-4	1.2215-3	.53560	3.0547	.006401	160.000	.2883	21.656	11.396	1.561	.012816	.044111
4.4472	5.4458-4	1.1826-3	.53305	3.0597	.006217	165.000	.2877	21.835	11.443	1.566	.012446	.043756
4.4625	5.2515-4	1.1460-3	.53055	3.0646	.006044	170.000	.2872	22.013	11.489	1.572	.012097	.043412
4.4774	5.0694-4	1.1115-3	.52813	3.0693	.005880	175.000	.2866	22.184	11.532	1.578	.011767	.043084
4.4920	4.8984-4	1.0791-3	.52576	3.0738	.005725	180.000	.2861	22.355	11.576	1.583	.011455	.042761
4.5063	4.7375-4	1.0484-3	.52343	3.0782	.005578	185.000	.2856	22.521	11.617	1.588	.011160	.042452
4.5203	4.5859-4	1.0194-3	.52115	3.0824	.005439	190.000	.2851	22.684	11.657	1.594	.010879	.042154
4.5340	4.4426-4	9.9196-4	.51894	3.0865	.005307	195.000	.2847	22.845	11.696	1.599	.010612	.041864
4.5474	4.3073-4	9.6591-4	.51677	3.0905	.005181	200.000	.2842	23.003	11.734	1.604	.010359	.041582
4.5606	4.1792-4	9.4117-4	.51464	3.0944	.005061	205.000	.2838	23.159	11.772	1.609	.010117	.041307
4.5735	4.0577-4	9.1765-4	.51255	3.0981	.004946	210.000	.2834	23.313	11.808	1.615	.009887	.041041
4.5862	3.9425-4	8.9525-4	.51051	3.1018	.004837	215.000	.2830	23.463	11.844	1.620	.009667	.040783
4.5987	3.8330-4	8.7390-4	.50851	3.1053	.004732	220.000	.2826	23.612	11.878	1.625	.009457	.040531

TABLE II.- Continued

(e) Concluded

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
4.6110	3.7288-4	8.5354-4	.50654	3.1088	.004632	225.000	.2822	23.758	11.912	1.629	.009256	.040287
4.6231	3.6297-4	8.3408-4	.50462	3.1121	.004537	230.000	.2818	23.902	11.944	1.634	.009063	.040049
4.6349	3.5351-4	8.1547-4	.50273	3.1154	.004445	235.000	.2814	24.044	11.976	1.639	.008878	.039817
4.6466	3.4449-4	7.9766-4	.50087	3.1186	.004357	240.000	.2811	24.185	12.008	1.644	.008701	.039590
4.6581	3.3587-4	7.8061-4	.49905	3.1217	.004272	245.000	.2807	24.323	12.038	1.649	.008531	.039370
4.6695	3.2763-4	7.6425-4	.49727	3.1248	.004191	250.000	.2804	24.459	12.068	1.653	.008368	.039154
4.6807	3.1975-4	7.4856-4	.49551	3.1278	.004112	255.000	.2801	24.594	12.098	1.658	.008210	.038944
4.6917	3.1220-4	7.3348-4	.49379	3.1306	.004037	260.000	.2797	24.727	12.127	1.663	.008059	.038738
4.7026	3.0496-4	7.1899-4	.49209	3.1335	.003964	265.000	.2794	24.858	12.155	1.667	.007913	.038538
4.7133	2.9802-4	7.0505-4	.49043	3.1362	.003894	270.000	.2791	24.988	12.182	1.672	.007773	.038342
4.7239	2.9136-4	6.9163-4	.48879	3.1390	.003827	275.000	.2788	25.116	12.209	1.676	.007637	.038150
4.7343	2.8496-4	6.7871-4	.48718	3.1416	.003762	280.000	.2785	25.242	12.236	1.680	.007506	.037962
4.7446	2.7881-4	6.6626-4	.48560	3.1442	.003699	285.000	.2782	25.367	12.262	1.685	.007380	.037779
4.7548	2.7289-4	6.5427-4	.48434	3.1467	.003638	290.000	.2780	25.490	12.287	1.689	.007258	.037599
4.7649	2.6719-4	6.4265-4	.48251	3.1492	.003579	295.000	.2777	25.612	12.312	1.693	.007140	.037423
4.7748	2.6171-4	6.3144-4	.48100	3.1517	.003522	300.000	.2774	25.733	12.337	1.698	.007026	.037251
4.7943	2.5132-4	6.1016-4	.47806	3.1564	.003414	310.000	.2769	25.970	12.385	1.706	.006808	.036916
4.8134	2.4165-4	5.9024-4	.47520	3.1609	.003312	320.000	.2764	26.203	12.431	1.714	.006603	.036595
4.8320	2.3262-4	5.7157-4	.47243	3.1653	.003216	330.000	.2759	26.430	12.475	1.722	.006411	.036285
4.8503	2.2419-4	5.5402-4	.46975	3.1695	.003125	340.000	.2755	26.653	12.519	1.730	.006230	.035987
4.8681	2.1628-4	5.3750-4	.46713	3.1736	.003040	350.000	.2750	26.871	12.560	1.738	.006058	.035700
4.8856	2.0886-4	5.2192-4	.46440	3.1775	.002959	360.000	.2746	27.085	12.601	1.746	.005896	.035422
4.9027	2.0189-4	5.3721-4	.46213	3.1813	.002883	370.000	.2742	27.295	12.640	1.753	.005743	.035154
4.9195	1.9532-4	4.9329-4	.45973	3.1850	.002810	380.000	.2738	27.501	12.678	1.761	.005598	.034895
4.9359	1.8913-4	4.8011-4	.45740	3.1885	.002741	390.000	.2734	27.704	12.716	1.768	.005459	.034644
4.9521	1.8329-4	4.6760-4	.45512	3.1919	.002675	400.000	.2730	27.903	12.752	1.775	.005328	.034401
4.9835	1.7251-4	4.4442-4	.45074	3.1986	.002553	420.000	.2723	28.291	12.821	1.789	.005083	.033937
5.0137	1.6282-4	4.2340-4	.44658	3.2048	.002442	440.000	.2717	28.665	12.887	1.803	.004860	.033500
5.0430	1.5407-4	4.0425-4	.44261	3.2106	.002340	460.000	.2710	29.028	12.949	1.816	.004656	.033087
5.0712	1.4613-4	3.8673-4	.43882	3.2162	.002246	480.000	.2704	29.381	13.009	1.828	.004469	.032697
5.0986	1.3889-4	3.7065-4	.43519	3.2215	.002160	500.000	.2699	29.722	13.066	1.841	.004296	.032327
5.1316	1.3071-4	3.5232-4	.43097	3.2277	.002061	525.000	.2692	30.136	13.134	1.856	.004099	.031889
5.1633	1.2335-4	3.3569-4	.42678	3.2336	.001971	550.000	.2686	30.536	13.199	1.871	.003919	.031477
5.1939	1.1670-4	3.2054-4	.42287	3.2392	.001889	575.000	.2680	30.923	13.260	1.885	.003754	.031089
5.2235	1.1068-4	3.0669-4	.41916	3.2445	.001813	600.000	.2674	31.299	13.318	1.898	.003603	.030721
5.2796	1.0015-4	2.8225-4	.41221	3.2543	.001679	650.000	.2664	32.017	13.428	1.925	.003334	.030041
5.3323	9.1120-5	2.6137-4	.40586	3.2631	.001563	700.000	.2654	32.696	13.528	1.949	.003103	.029426
5.3819	8.3786-5	2.4334-4	.39996	3.2713	.001462	750.000	.2645	33.341	13.621	1.973	.002903	.028864
5.4288	7.7300-5	2.2761-4	.39450	3.2788	.001374	800.000	.2638	33.956	13.707	1.996	.002727	.028348
5.4732	7.1683-5	2.1377-4	.38942	3.2857	.001297	850.000	.2630	34.543	13.788	2.017	.002571	.027872
5.5155	6.6725-5	2.0150-4	.38466	3.2922	.001226	900.000	.2623	35.105	13.863	2.038	.002432	.027432
5.5943	5.8492-5	1.8071-4	.37630	3.3038	.001108	1000.000	.2611	36.165	14.001	2.076	.002196	.026638
5.6312	5.5031-5	1.7183-4	.37233	3.3091	.001057	1050.000	.2605	36.666	14.064	2.095	.002094	.026276
5.6665	5.1921-5	1.6377-4	.36828	3.3141	.001010	1100.000	.2600	37.151	14.125	2.112	.002002	.025937
5.7006	4.9113-5	1.5643-4	.36471	3.3188	.000968	1150.000	.2595	37.619	14.182	2.130	.001917	.025621
5.7333	4.6566-5	1.4971-4	.36132	3.3233	.000929	1200.000	.2590	38.074	14.237	2.146	.001839	.025317
5.7649	4.4247-5	1.4354-4	.35809	3.3275	.000892	1250.000	.2586	38.515	14.289	2.162	.001768	.025031

TABLE II. - Continued

(f) Product mixture F

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
0.0000	1.0000 0	1.0000 0	1.00000	0.0000	0.000000	0.000						
.0249	9.9965-1	9.9969-1	.99997	.0249	.000349	24.000						
.0299	9.9950-1	9.9956-1	.99996	.0299	.000501	20.000						
.0341	9.9934-1	9.9942-1	.99995	.0341	.000654	17.500						
.0399	9.9911-1	9.9921-1	.99992	.0398	.000890	15.000						
.0478	9.9871-1	9.9886-1	.99989	.0478	.001283	12.500						
.0598	9.9797-1	9.9821-1	.99984	.0598	.002005	10.000						
.0799	9.9642-1	9.9682-1	.99970	.0799	.003571	7.500						
.1203	9.9190-1	9.9279-1	.99933	.1203	.003067	5.000						
.1339	9.8998-1	9.9108-1	.99917	.1339	.009976	4.500						
.1511	9.8727-1	9.8864-1	.99895	.1510	.012657	4.000						
.1733	9.8328-1	9.8511-1	.99861	.1731	.016591	3.500						
.2034	9.7705-1	9.7955-1	.99809	.2031	.022709	3.000						
.2466	9.6647-1	9.7010-1	.99720	.2461	.033021	2.500						
.2763	9.5812-1	9.6264-1	.99649	.2756	.041093	2.250						
.3146	9.4603-1	9.5187-1	.99545	.3136	.052584	2.000						
.3545	9.3211-1	9.3933-1	.99424	.3531	.065785	1.800						
.4074	9.1145-1	9.2077-1	.99241	.4052	.084938	1.600						
.4822	8.7846-1	8.9103-1	.98942	.4786	.114642	1.400						
.5337	8.5345-1	8.6839-1	.98709	.5298	.136423	1.300						
.5651	8.3739-1	8.5390-1	.98556	.5593	.150068	1.250						
.6021	8.1780-1	8.3600-1	.98367	.5951	.165308	1.200						
.6467	7.9324-1	8.1358-1	.98123	.6380	.184075	1.150						
.7033	7.6097-1	7.8392-1	.97792	.6923	.211062	1.100						
.7832	7.1351-1	7.4025-1	.97284	.7680	.245318	1.050						
.8434	6.7689-1	7.0626-1	.96872	.8246	.269821	1.025						
.9671	6.0084-1	6.3498-1	.95949	.9392	.314659	1.001						
1.0000	5.8069-1	6.1593-1	.95688	.9692	.325060	1.000						
1.0330	5.6057-1	5.9693-1	.95419	.9992	.334784	1.001	.9567	1.085	1.076	1.005	1.000000	.560575
1.1050	5.1730-1	5.5548-1	.94811	1.0641	.353328	1.010	.9021	1.239	1.212	1.016	.999260	.517688
1.1494	4.9119-1	5.3035-1	.94423	1.1035	.362851	1.020	.8691	1.343	1.302	1.023	.997063	.492642
1.1836	4.7139-1	5.1118-1	.94115	1.1338	.369181	1.030	.8451	1.427	1.374	1.028	.994390	.474043
1.2126	4.5489-1	4.9515-1	.93851	1.1593	.373836	1.040	.8259	1.499	1.437	1.032	.991382	.458844
1.2613	4.2777-1	4.6865-1	.93369	1.2017	.380216	1.060	.7955	1.626	1.544	1.039	.984657	.434431
1.3023	4.0553-1	4.4679-1	.93007	1.2372	.384184	1.080	.7718	1.737	1.637	1.045	.977287	.414958
1.3384	3.8650-1	4.2797-1	.92658	1.2681	.386628	1.100	.7521	1.837	1.720	1.050	.969482	.398668
1.4784	3.1768-1	3.5902-1	.91253	1.3857	.387264	1.200	.6856	2.253	2.057	1.068	.927627	.342466
1.5926	2.7185-1	3.1220-1	.90162	1.4709	.377458	1.300	.6440	2.590	2.322	1.082	.885343	.307055
1.6677	2.3802-1	2.7710-1	.89247	1.5389	.368642	1.400	.6142	2.881	2.547	1.093	.844917	.281703
1.7402	2.1169-1	2.4941-1	.88452	1.5997	.359773	1.500	.5913	3.142	2.743	1.102	.807084	.262295
1.8036	1.9052-1	2.2697-1	.87746	1.6446	.344722	1.600	.5728	3.378	2.918	1.110	.771929	.246808
1.8600	1.7307-1	2.0810-1	.87111	1.6874	.332901	1.700	.5575	3.596	3.077	1.117	.739424	.234058
1.9110	1.5842-1	1.9219-1	.86532	1.7256	.321521	1.800	.5444	3.799	3.222	1.123	.709355	.223331
1.9575	1.4595-1	1.7852-1	.86000	1.7600	.313669	1.900	.5332	3.989	3.356	1.129	.681537	.214148
2.0000	1.3520-1	1.6664-1	.85508	1.7912	.303370	2.000	.5234	4.167	3.481	1.134	.655778	.206164
2.0397	1.2583-1	1.5621-1	.85051	1.8198	.297639	2.100	.5146	4.335	3.598	1.139	.631840	.199156
2.0765	1.1761-1	1.4698-1	.84623	1.8462	.281443	2.200	.5069	4.495	3.707	1.143	.609583	.192933
2.1110	1.1033-1	1.3875-1	.84221	1.8706	.272765	2.300	.4998	4.646	3.810	1.148	.588853	.187360
2.1433	1.0384-1	1.3138-1	.83843	1.8933	.264577	2.400	.4934	4.792	3.908	1.152	.569531	.182322
2.1738	9.8021-2	1.2472-1	.83486	1.9146	.255845	2.500	.4876	4.930	4.000	1.155	.551414	.177763
2.2026	9.2777-2	1.1869-1	.83147	1.9345	.249536	2.600	.4822	5.063	4.088	1.159	.534428	.173602
2.2299	8.8029-2	1.1320-1	.82825	1.9532	.242621	2.700	.4772	5.191	4.172	1.162	.518526	.169768
2.2559	8.3709-2	1.0817-1	.82518	1.9710	.236075	2.800	.4726	5.313	4.252	1.165	.503512	.166251
2.2807	7.9764-2	1.0356-1	.82225	1.9877	.229876	2.900	.4684	5.432	4.328	1.168	.489378	.162991
2.3043	7.6148-2	9.9316-2	.81945	2.0036	.223989	3.000	.4644	5.546	4.402	1.171	.476043	.159961
2.3487	6.9751-2	9.1753-2	.81419	2.0332	.213078	3.200	.4571	5.764	4.540	1.177	.451474	.154497
2.3896	6.4283-2	8.5232-2	.80933	2.0600	.203204	3.400	.4507	5.968	4.669	1.182	.429416	.149700
2.4275	5.9552-2	7.9544-2	.80482	2.0847	.194215	3.600	.4449	6.160	4.788	1.186	.409456	.145442
2.4628	5.5422-2	7.4543-2	.80061	2.1075	.186041	3.800	.4397	6.342	4.901	1.190	.391331	.141626
2.4959	5.1790-2	7.0114-2	.79666	2.1295	.178472	4.000	.4350	6.515	5.006	1.194	.374788	.138186
2.5270	4.8573-2	6.6164-2	.79295	2.1497	.171541	4.200	.4307	6.679	5.106	1.198	.359631	.135063
2.5563	4.5704-2	6.2621-2	.78945	2.1666	.165146	4.400	.4267	6.836	5.200	1.202	.345693	.132211
2.5841	4.3132-2	5.9425-2	.78613	2.1839	.159222	4.600	.4230	6.987	5.289	1.205	.332834	.129591
2.6104	4.0814-2	5.6529-2	.78299	2.2001	.153722	4.800	.4196	7.131	5.375	1.208	.320928	.127175
2.6354	3.8715-2	5.3892-2	.78000	2.2154	.148602	5.000	.4165	7.269	5.456	1.211	.309869	.124940
2.6931	3.4249-2	4.8233-2	.77311	2.2533	.137221	5.500	.4094	7.593	5.644	1.218	.285400	.120001
2.7448	3.0645-2	4.3615-2	.76692	2.2812	.127510	6.000	.4033	7.880	5.813	1.225	.264625	.115806
2.7918	2.7683-2	3.9780-2	.76131	2.3087	.119123	6.500	.3980	8.143	5.968	1.230	.246757	.112186

TABLE II.- Continued

(f) Continued

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
2.8347	2.5208-2	3.6645-2	.75619	2.3336	.111806	7.000	.3933	8.418	6.109	1.236	.231227	.109018
2.8742	2.3112-2	3.3781-2	.75147	2.3562	.105364	7.500	.3891	8.656	6.240	1.241	.217597	.106214
2.9108	2.1316-2	3.1393-2	.74710	2.3770	.097648	8.000	.3853	8.840	6.362	1.245	.205529	.103711
2.9449	1.9761-2	2.9311-2	.74304	2.3961	.094540	8.500	.3819	9.090	6.476	1.249	.194771	.101459
2.9767	1.8403-2	2.7480-2	.73924	2.4138	.089949	9.000	.3788	9.289	6.582	1.253	.185120	.099414
3.0067	1.7208-2	2.5857-2	.73567	2.4303	.085796	9.500	.3759	9.479	6.682	1.257	.176410	.097547
3.0349	1.6149-2	2.4409-2	.73232	2.4457	.082022	10.000	.3732	9.659	6.777	1.261	.168507	.095835
3.0868	1.4356-2	2.1939-2	.72614	2.4737	.075420	11.000	.3685	9.995	6.952	1.267	.154710	.092795
3.1337	1.2899-2	1.9910-2	.72055	2.4986	.069832	12.000	.3643	10.304	7.110	1.273	.143064	.090166
3.1765	1.1694-2	1.8215-2	.71547	2.5210	.065039	13.000	.3607	10.589	7.254	1.278	.133096	.087862
3.2158	1.0682-2	1.6778-2	.71081	2.5414	.060881	14.000	.3574	10.855	7.387	1.283	.124459	.085825
3.2522	9.8202-3	1.5546-2	.70650	2.5600	.057238	15.000	.3544	11.105	7.511	1.288	.116913	.083996
3.2859	9.0791-3	1.4478-2	.70250	2.5771	.054020	16.000	.3517	11.338	7.625	1.292	.110249	.082351
3.3175	8.4357-3	1.3543-2	.69876	2.5930	.051155	17.000	.3493	11.560	7.733	1.296	.104328	.080853
3.3471	7.8713-3	1.2718-2	.69525	2.6078	.048586	18.000	.3470	11.749	7.833	1.300	.099026	.079484
3.3749	7.3729-3	1.1986-2	.69195	2.6214	.046272	19.000	.3449	11.968	7.928	1.304	.094249	.078228
3.4012	6.9302-3	1.1331-2	.68884	2.6343	.044174	20.000	.3430	12.158	8.018	1.307	.089929	.077064
3.4261	6.5344-3	1.0742-2	.68589	2.6464	.042263	21.000	.3412	12.338	8.103	1.311	.085992	.075988
3.4498	6.1785-3	1.0210-2	.68309	2.6574	.040517	22.000	.3395	12.511	8.183	1.314	.082397	.074985
3.4724	5.8573-3	9.7264-3	.68042	2.6685	.038913	23.000	.3379	12.678	8.261	1.317	.079101	.074045
3.4939	5.5651-3	9.2856-3	.67787	2.6788	.037434	24.000	.3364	12.838	8.334	1.320	.076064	.073164
3.5145	5.2991-3	8.8820-3	.67544	2.6885	.036066	25.000	.3350	12.992	8.405	1.322	.073257	.072336
3.5342	5.0558-3	8.5111-3	.67311	2.6977	.034798	26.000	.3336	13.140	8.472	1.325	.070656	.071555
3.5531	4.8324-3	8.1691-3	.67097	2.7066	.033619	27.000	.3324	13.283	8.537	1.328	.068238	.070817
3.5713	4.6266-3	7.8529-3	.66872	2.7150	.032520	28.000	.3312	13.422	8.599	1.330	.065984	.070117
3.5889	4.4366-3	7.5594-3	.66664	2.7231	.031491	29.000	.3300	13.556	8.659	1.333	.063879	.069453
3.6058	4.2605-3	7.2870-3	.66465	2.7308	.030529	30.000	.3289	13.686	8.717	1.335	.061907	.068821
3.6378	3.9447-3	6.7952-3	.66095	2.7454	.028773	32.000	.3269	13.934	8.826	1.339	.058315	.067645
3.6678	3.6697-3	6.3647-3	.65759	2.7589	.027214	34.000	.3250	14.169	8.929	1.344	.055127	.066569
3.6960	3.4284-3	5.9833-3	.65396	2.7715	.025819	36.000	.3232	14.392	9.026	1.348	.052279	.065579
3.7226	3.2149-3	5.6444-3	.65081	2.7832	.024564	38.000	.3216	14.604	9.117	1.351	.049716	.064666
3.7478	3.1243-3	5.3419-3	.64783	2.7943	.023429	40.000	.3201	14.807	9.203	1.355	.047399	.063816
3.7716	2.8546-3	5.0678-3	.64500	2.8047	.022396	42.000	.3187	15.000	9.285	1.359	.045294	.063026
3.7943	2.7014-3	4.8206-3	.64230	2.8145	.021453	44.000	.3174	15.185	9.362	1.362	.043371	.062286
3.8160	2.5628-3	4.5958-3	.63973	2.8238	.020588	46.000	.3161	15.363	9.436	1.365	.041609	.061592
3.8367	2.4368-3	4.3906-3	.63727	2.8326	.019792	48.000	.3149	15.534	9.507	1.368	.039998	.060938
3.8565	2.3219-3	4.2025-3	.63491	2.8410	.019057	50.000	.3138	15.699	9.575	1.371	.038491	.060322
3.9026	2.0744-3	3.7944-3	.62942	2.8604	.017442	55.000	.3113	16.097	9.732	1.378	.035207	.058920
3.9446	1.8718-3	3.4575-3	.62441	2.8777	.016085	60.000	.3090	16.445	9.876	1.385	.032450	.057683
3.9931	1.7031-3	3.1742-3	.61980	2.8934	.014929	65.000	.3070	16.778	10.007	1.391	.030103	.056577
4.0187	1.5607-3	2.9329-3	.61553	2.9077	.013931	70.000	.3052	17.099	10.128	1.397	.028078	.055584
4.0517	1.4389-3	2.7251-3	.61156	2.9201	.013061	75.000	.3035	17.391	10.240	1.402	.026313	.054680
4.0826	1.3335-3	2.5442-3	.60784	2.9314	.012296	80.000	.3020	17.667	10.345	1.407	.024762	.053854
4.1115	1.2417-3	2.3853-3	.60434	2.9419	.011617	85.000	.3006	17.919	10.443	1.412	.023388	.053093
4.1388	1.1610-3	2.2448-3	.60104	2.9549	.011011	90.000	.2993	18.167	10.535	1.417	.022160	.052391
4.1645	1.0895-3	2.1195-3	.59791	2.9646	.010466	95.000	.2981	18.434	10.623	1.422	.021057	.051737
4.1989	1.0257-3	2.0073-3	.59494	2.9740	.009974	100.000	.2969	18.629	10.705	1.426	.020061	.051130
4.2121	9.6956-4	1.9061-3	.59210	2.9827	.009527	105.000	.2959	18.846	10.783	1.430	.019157	.050559
4.2342	9.1704-4	1.8145-3	.58940	2.9910	.009119	110.000	.2948	19.055	10.858	1.434	.018333	.050022
4.2553	8.7039-4	1.7311-3	.58680	2.9988	.008746	115.000	.2939	19.255	10.928	1.438	.017577	.049518
4.2755	8.2704-4	1.6548-3	.58432	3.0063	.008403	120.000	.2930	19.446	10.996	1.442	.016883	.049041
4.2948	7.8913-4	1.5849-3	.58192	3.0133	.008085	125.000	.2922	19.635	11.061	1.446	.016242	.048589
4.3134	7.5366-4	1.5205-3	.57962	3.0201	.007791	130.000	.2913	19.815	11.123	1.449	.015649	.048159
4.3313	7.2099-4	1.4611-3	.57740	3.0266	.007519	135.000	.2905	19.990	11.183	1.453	.015099	.047750
4.3486	6.9094-4	1.4061-3	.57525	3.0327	.007265	140.000	.2898	20.159	11.240	1.456	.014587	.047361
4.3813	6.3708-4	1.3077-3	.57116	3.0441	.006807	150.000	.2885	20.443	11.349	1.463	.013662	.046632
4.3968	6.1301-4	1.2629-3	.56921	3.0497	.006599	155.000	.2878	20.640	11.401	1.466	.013243	.046288
4.4119	5.9057-4	1.2213-3	.56732	3.0552	.006404	160.000	.2872	20.791	11.451	1.469	.012849	.045962
4.4265	5.6961-4	1.1923-3	.56548	3.0601	.006220	165.000	.2866	20.938	11.499	1.472	.012479	.045647
4.4406	5.4999-4	1.1457-3	.56369	3.0650	.006047	170.000	.2860	21.083	11.546	1.475	.012130	.045341
4.4544	5.3157-4	1.1113-3	.56195	3.0697	.005883	175.000	.2855	21.223	11.591	1.478	.011799	.045051
4.4677	5.1427-4	1.0789-3	.56025	3.0743	.005729	180.000	.2849	21.360	11.635	1.481	.011487	.044769
4.4807	4.9798-4	1.0491-3	.55860	3.0787	.005591	185.000	.2844	21.495	11.678	1.484	.011192	.044495
4.4934	4.8261-4	1.0191-3	.55698	3.0830	.005442	190.000	.2839	21.627	11.720	1.487	.010911	.044231
4.5057	4.6810-4	9.9164-4	.55540	3.0872	.005310	195.000	.2835	21.755	11.760	1.489	.010644	.043977
4.5178	4.5439-4	9.6559-4	.55386	3.0913	.005184	200.000	.2830	21.881	11.800	1.492	.010390	.043730
4.5295	4.4133-4	9.4094-4	.55235	3.0952	.005064	205.000	.2825	22.005	11.838	1.495	.010149	.043491
4.5409	4.2905-4	9.1731-4	.55098	3.0990	.004949	210.000	.2821	22.126	11.876	1.497	.009918	.043258
4.5521	4.1734-4	8.9490-4	.54943	3.1027	.004840	215.000	.2817	22.245	11.912	1.500	.009698	.043032
4.5631	4.0620-4	8.7355-4	.54802	3.1063	.004735	220.000	.2813	22.362	11.948	1.503	.009488	.042813

TABLE II. - Concluded

(f) Concluded

N_{Ma}	p/p_t	ρ/ρ_t	T/T_t	V/a_t	q/p_t	A/A^*	$N_{Ma,2}$	p_2/p_1	ρ_2/ρ_1	T_2/T_1	$p_{t,2}/p_{t,1}$	$p_1/p_{t,2}$
4.5738	3.9560-4	8.5317-4	.54663	3.1098	.004635	225.000	.2809	22.477	11.983	1.505	.009287	.042600
4.5842	3.8551-4	8.3371-4	.54527	3.1132	.004540	230.000	.2805	22.590	12.016	1.508	.009094	.042393
4.5945	3.7587-4	8.1510-4	.54393	3.1166	.004448	235.000	.2801	22.701	12.050	1.510	.008909	.042190
4.6045	3.6667-4	7.9728-4	.54263	3.1199	.004360	240.000	.2797	22.810	12.082	1.513	.008732	.041993
4.6144	3.5788-4	7.8021-4	.54134	3.1230	.004275	245.000	.2794	22.917	12.114	1.515	.008561	.041802
4.6240	3.4947-4	7.6385-4	.54008	3.1261	.004194	250.000	.2790	23.023	12.145	1.517	.008398	.041614
4.6335	3.4141-4	7.4815-4	.53884	3.1291	.004115	255.000	.2787	23.127	12.176	1.520	.008240	.041431
4.6427	3.3369-4	7.3307-4	.53761	3.1321	.004040	260.000	.2783	23.229	12.205	1.522	.008089	.041253
4.6519	3.2628-4	7.1857-4	.53641	3.1350	.003968	265.000	.2780	23.330	12.235	1.524	.007943	.041079
4.6608	3.1918-4	7.0463-4	.53523	3.1378	.003898	270.000	.2777	23.430	12.263	1.527	.007802	.040908
4.6696	3.1235-4	6.9120-4	.53407	3.1406	.003830	275.000	.2774	23.528	12.292	1.529	.007667	.040741
4.6782	3.0578-4	6.7828-4	.53293	3.1433	.003765	280.000	.2771	23.625	12.319	1.531	.007536	.040578
4.6867	2.9947-4	6.6582-4	.53180	3.1460	.003702	285.000	.2768	23.720	12.346	1.533	.007409	.040419
4.6951	2.9339-4	6.5379-4	.53069	3.1486	.003641	290.000	.2765	23.814	12.373	1.536	.007287	.040263
4.7033	2.8753-4	6.4219-4	.52960	3.1511	.003582	295.000	.2762	23.907	12.399	1.538	.007169	.040110
4.7114	2.8189-4	6.3098-4	.52852	3.1537	.003526	300.000	.2759	23.999	12.425	1.540	.007054	.039959
4.7271	2.7118-4	6.0969-4	.52641	3.1585	.003417	310.000	.2754	24.180	12.475	1.544	.006836	.039668
4.7424	2.6120-4	5.8974-4	.52436	3.1632	.003315	320.000	.2748	24.356	12.523	1.548	.006631	.039388
4.7573	2.5189-4	5.7107-4	.52236	3.1677	.003219	330.000	.2743	24.527	12.570	1.552	.006439	.039118
4.7717	2.4314-4	5.5352-4	.52041	3.1721	.003129	340.000	.2739	24.694	12.615	1.556	.006257	.038858
4.7858	2.3495-4	5.3699-4	.51851	3.1763	.003044	350.000	.2734	24.860	12.659	1.560	.006086	.038606
4.7995	2.2725-4	5.2140-4	.51665	3.1804	.002963	360.000	.2729	25.021	12.702	1.564	.005924	.038363
4.8128	2.2000-4	5.0668-4	.51484	3.1843	.002886	370.000	.2725	25.179	12.743	1.568	.005770	.038127
4.8258	2.1316-4	4.9276-4	.51307	3.1881	.002814	380.000	.2721	25.334	12.784	1.572	.005624	.037899
4.8385	2.0670-4	4.7956-4	.51134	3.1918	.002745	390.000	.2717	25.486	12.823	1.576	.005486	.037678
4.8509	2.0059-4	4.6705-4	.50964	3.1955	.002679	400.000	.2713	25.635	12.861	1.580	.005354	.037464
4.8748	1.8931-4	4.4385-4	.50635	3.2024	.002557	420.000	.2705	25.925	12.934	1.587	.005109	.037053
4.8977	1.7913-4	4.2282-4	.50319	3.2089	.002446	440.000	.2698	26.206	13.004	1.594	.004886	.036663
4.9197	1.6991-4	4.0365-4	.50015	3.2151	.002344	460.000	.2692	26.477	13.071	1.601	.004682	.036295
4.9409	1.6153-4	3.8613-4	.49721	3.2209	.002250	480.000	.2685	26.742	13.135	1.608	.004494	.035943
4.9613	1.5386-4	3.7004-4	.49438	3.2265	.002164	500.000	.2679	26.997	13.195	1.615	.004321	.035609
4.9858	1.4517-4	3.5170-4	.49097	3.2332	.002065	525.000	.2672	27.308	13.268	1.623	.004123	.035212
5.0093	1.3733-4	3.3506-4	.48769	3.2395	.001975	550.000	.2665	27.609	13.337	1.631	.003942	.034835
5.0319	1.3023-4	3.1990-4	.48453	3.2454	.001893	575.000	.2659	27.900	13.403	1.639	.003777	.034478
5.0537	1.2376-4	3.0634-4	.48149	3.2511	.001817	600.000	.2653	28.183	13.466	1.647	.003625	.034138
5.0951	1.1245-4	2.8159-4	.47570	3.2616	.001683	650.000	.2642	28.725	13.583	1.662	.003356	.033505
5.1329	1.0289-4	2.6071-4	.47028	3.2712	.001567	700.000	.2632	29.241	13.692	1.676	.003125	.032924
5.1706	9.4685-5	2.4247-4	.46518	3.2801	.001467	750.000	.2622	29.733	13.793	1.690	.002974	.032386
5.2054	8.7601-5	2.2694-4	.46036	3.2882	.001378	800.000	.2614	30.203	13.887	1.704	.002747	.031892
5.2385	8.1419-5	2.1309-4	.45580	3.2958	.001300	850.000	.2606	30.656	13.975	1.717	.002591	.031428
5.2701	7.5983-5	2.0082-4	.45147	3.3029	.001231	900.000	.2598	31.090	14.057	1.730	.002451	.030997
5.3297	6.6875-5	1.8004-4	.44340	3.3158	.001112	1000.000	.2585	31.913	14.208	1.754	.002214	.030208
5.3578	6.3028-5	1.7116-4	.43964	3.3217	.001061	1050.000	.2579	32.305	14.278	1.766	.002112	.029847
5.3850	5.9563-5	1.6311-4	.43604	3.3272	.001014	1100.000	.2573	32.685	14.344	1.777	.002019	.029505
5.4113	5.6425-5	1.5577-4	.43259	3.3325	.000972	1150.000	.2568	33.054	14.407	1.789	.001934	.029181
5.4367	5.3573-5	1.4906-4	.42927	3.3375	.000933	1200.000	.2563	33.413	14.468	1.799	.001856	.028871
5.4615	5.0970-5	1.4289-4	.42608	3.3422	.000897	1250.000	.2558	33.761	14.525	1.810	.001784	.028578
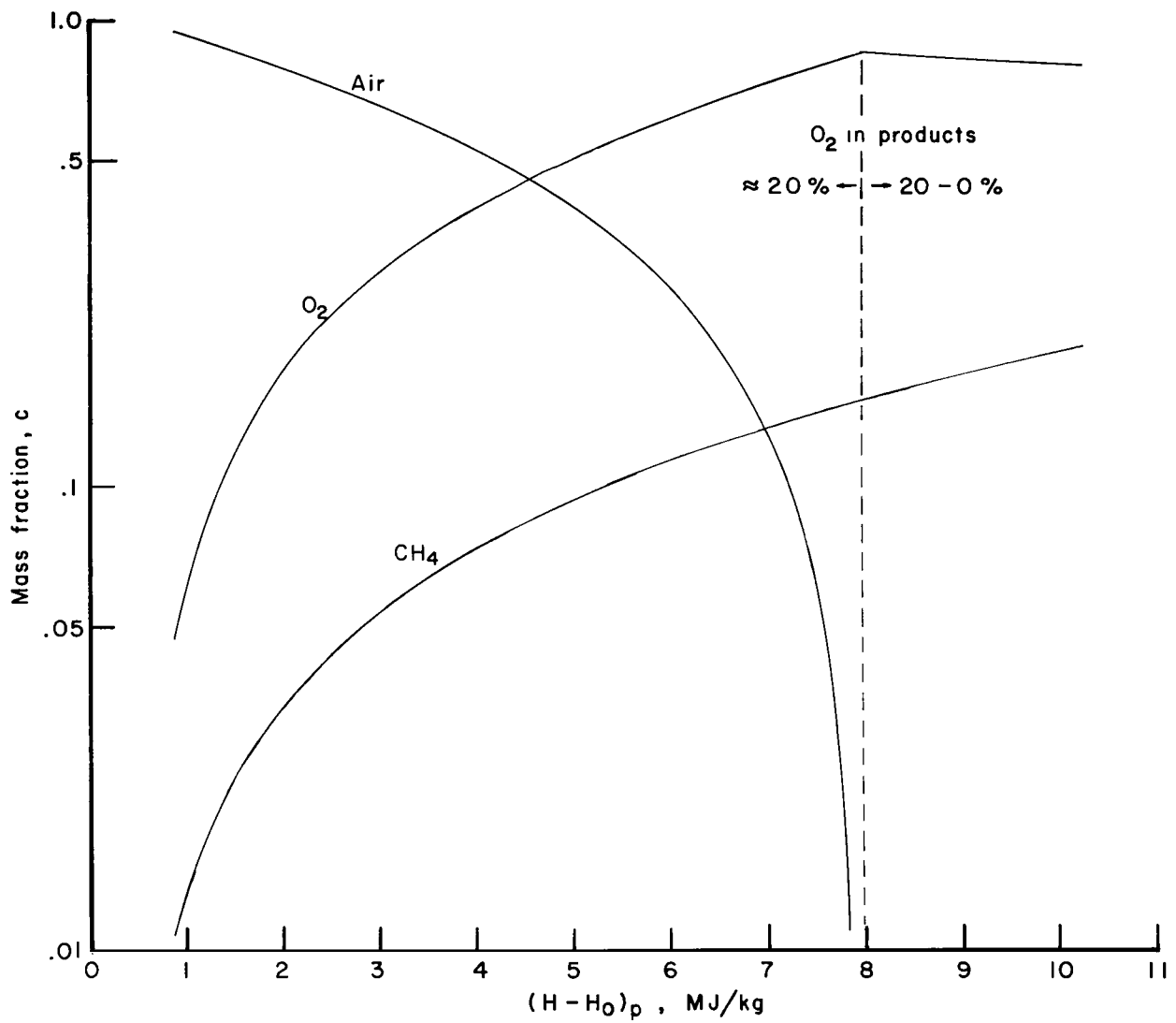
Figure 1.- Composition of methane-air-oxygen mixtures and enthalpy of products after adiabatic combustion $(T_{initial} = 298 \text{ K})$.
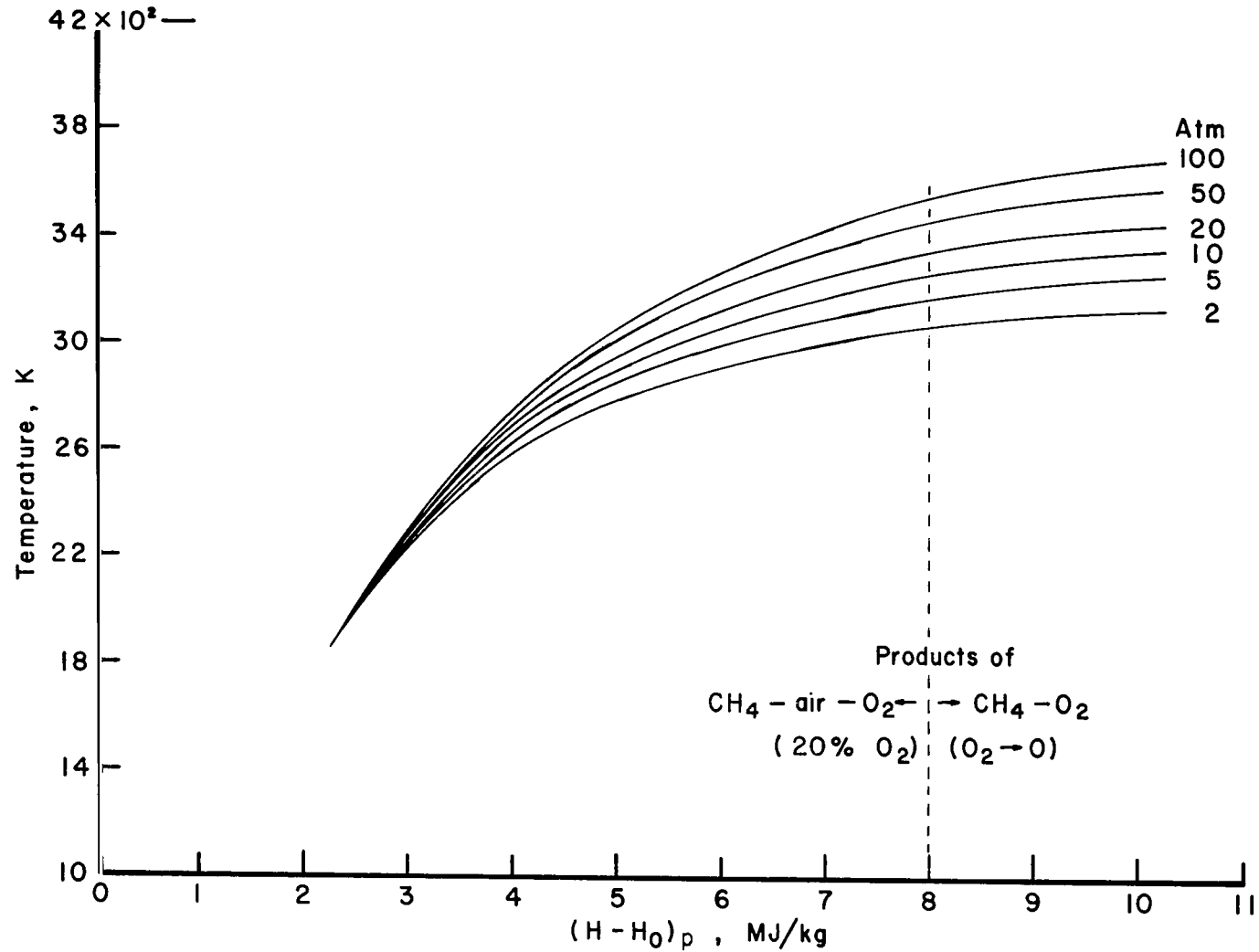
Figure 2.- Equilibrium temperatures of products resulting from combustion of methane-air-oxygen mixtures at various pressures ($T_{initial}$ = 298 K).
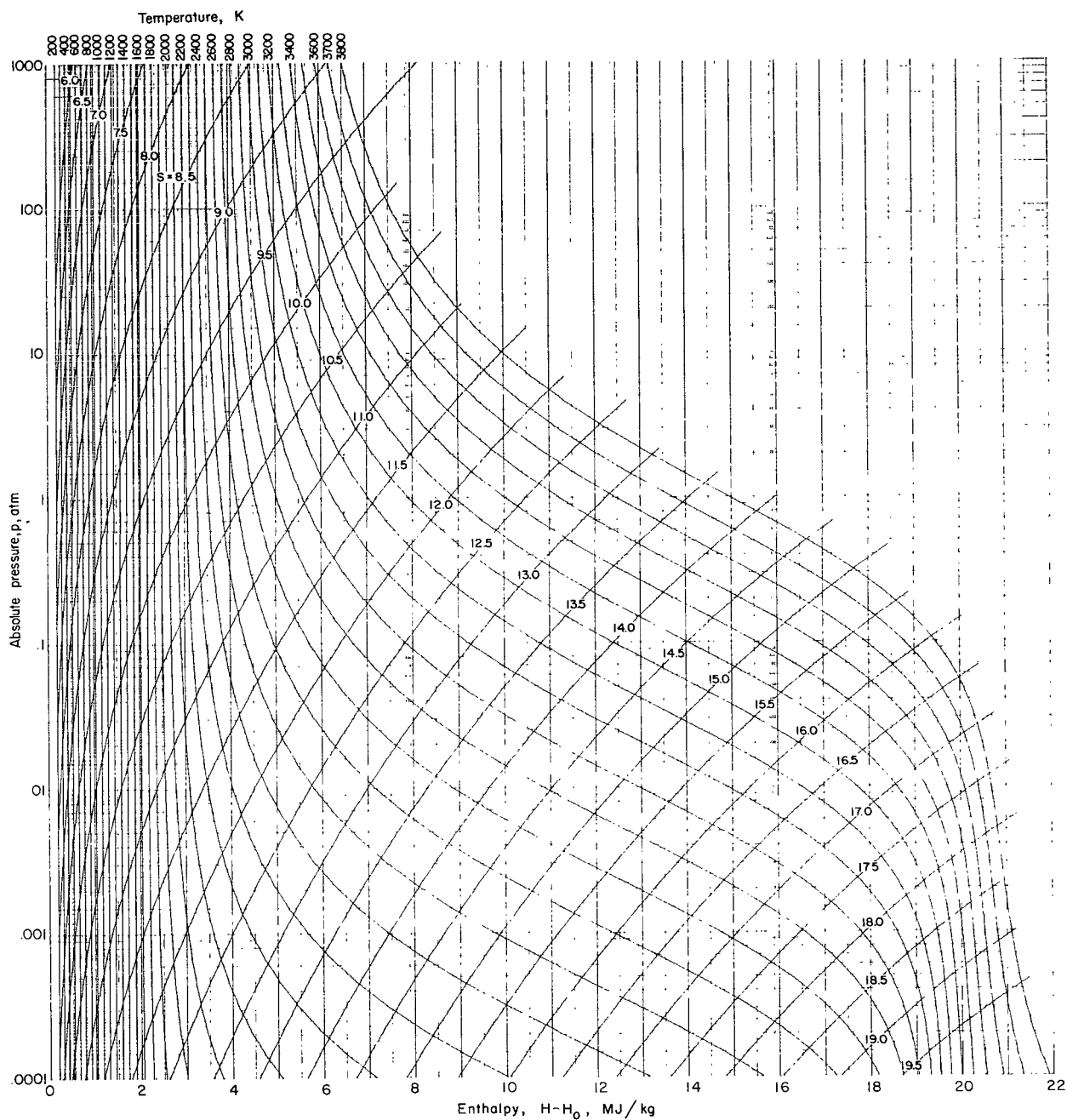
(a) Pressure-enthalpy diagram with lines of constant temperature and entropy.

Figure 3.- Thermodynamic and transport properties for products of methane-air-oxygen combustion (mixture A).
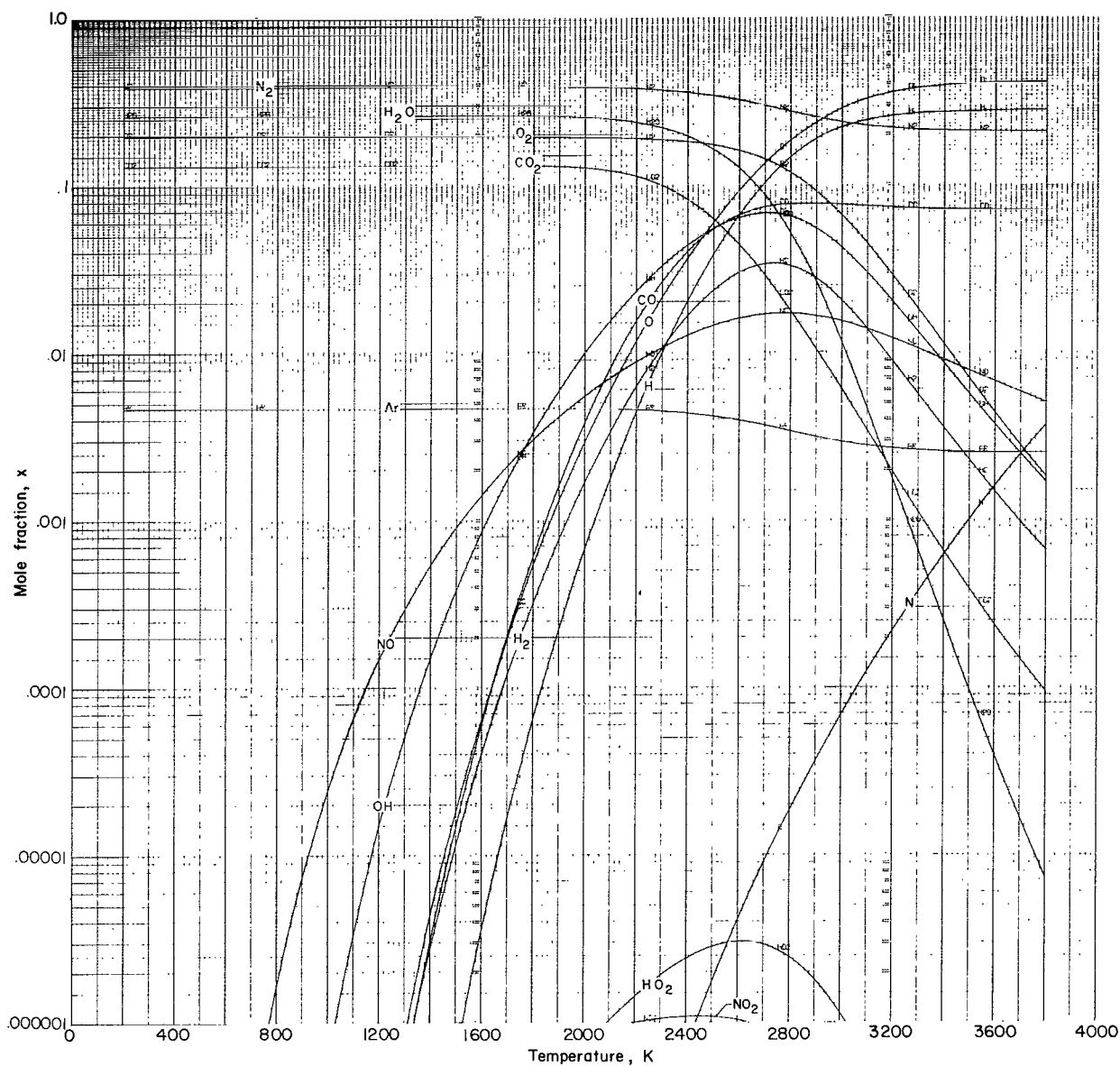
(b) Variation of composition with temperature at p = 0.01 atm.

Figure 3.- Continued.
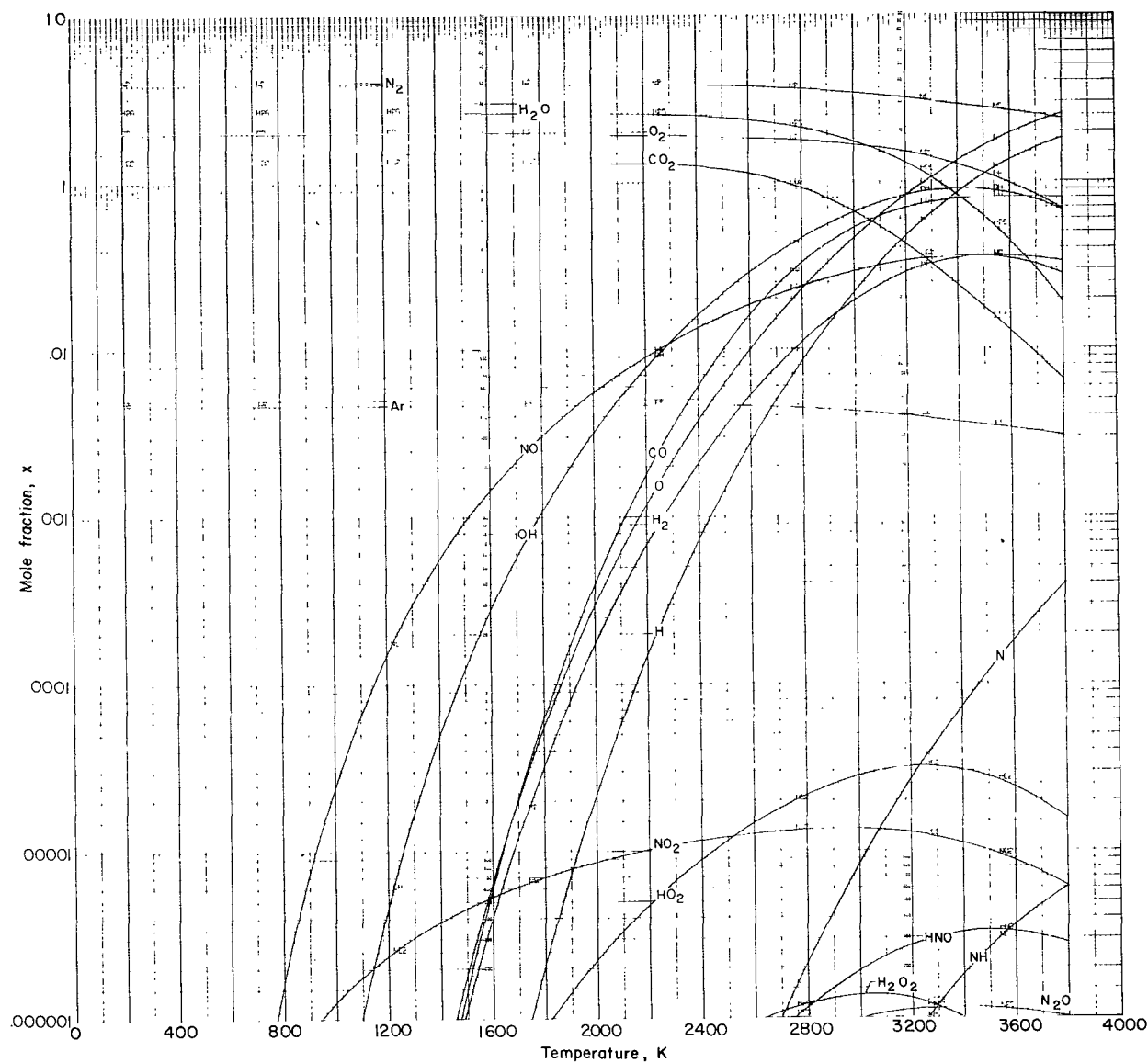
(c) Variation of composition with temperature at p = 1.0 atm.

Figure 3.- Continued.
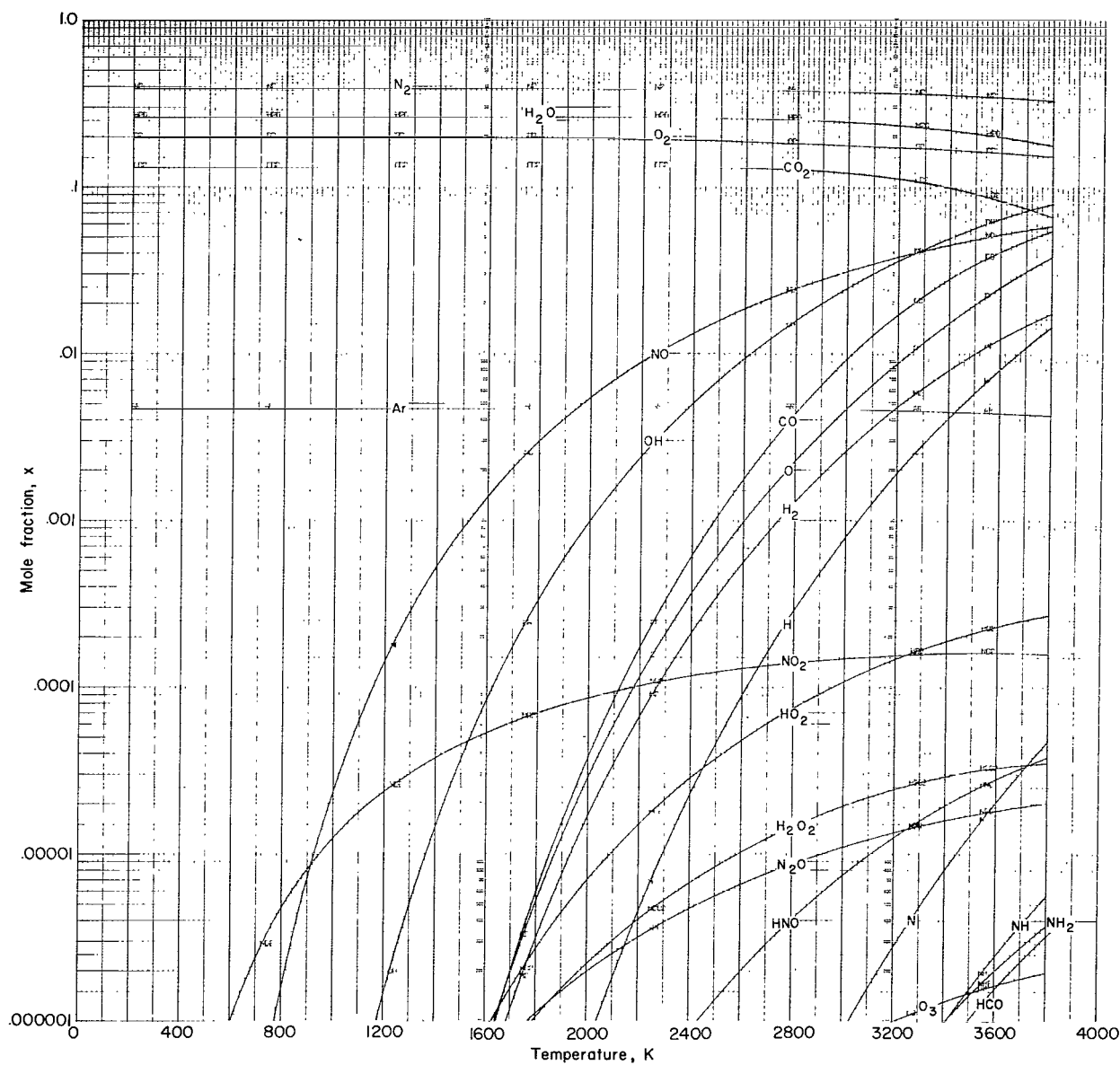
(d) Variation of composition with temperature at p = 100 atm.

Figure 3.- Continued.
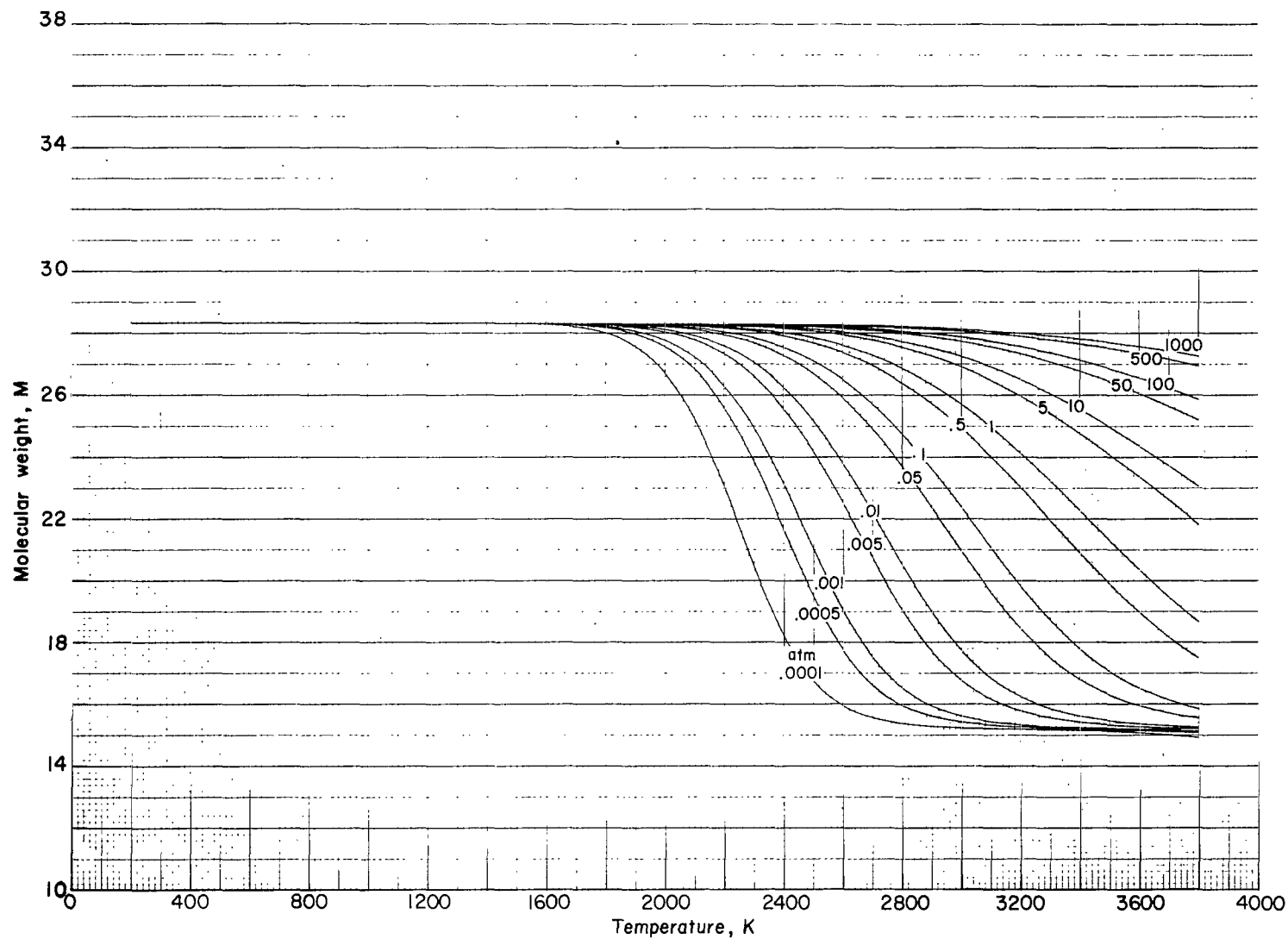
(e) Molecular weight as a function of temperature for various pressures.
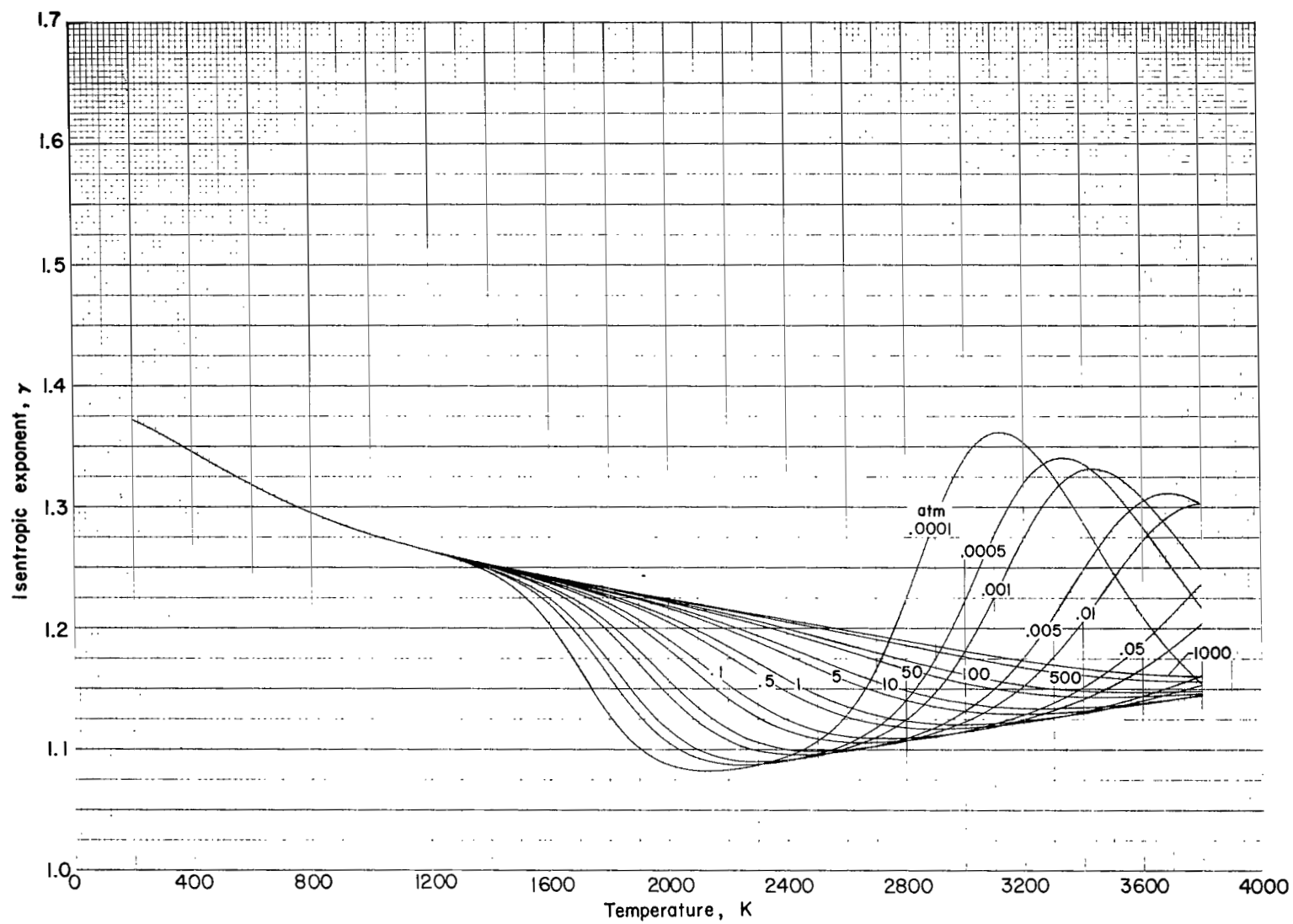
Figure 3.- Continued.

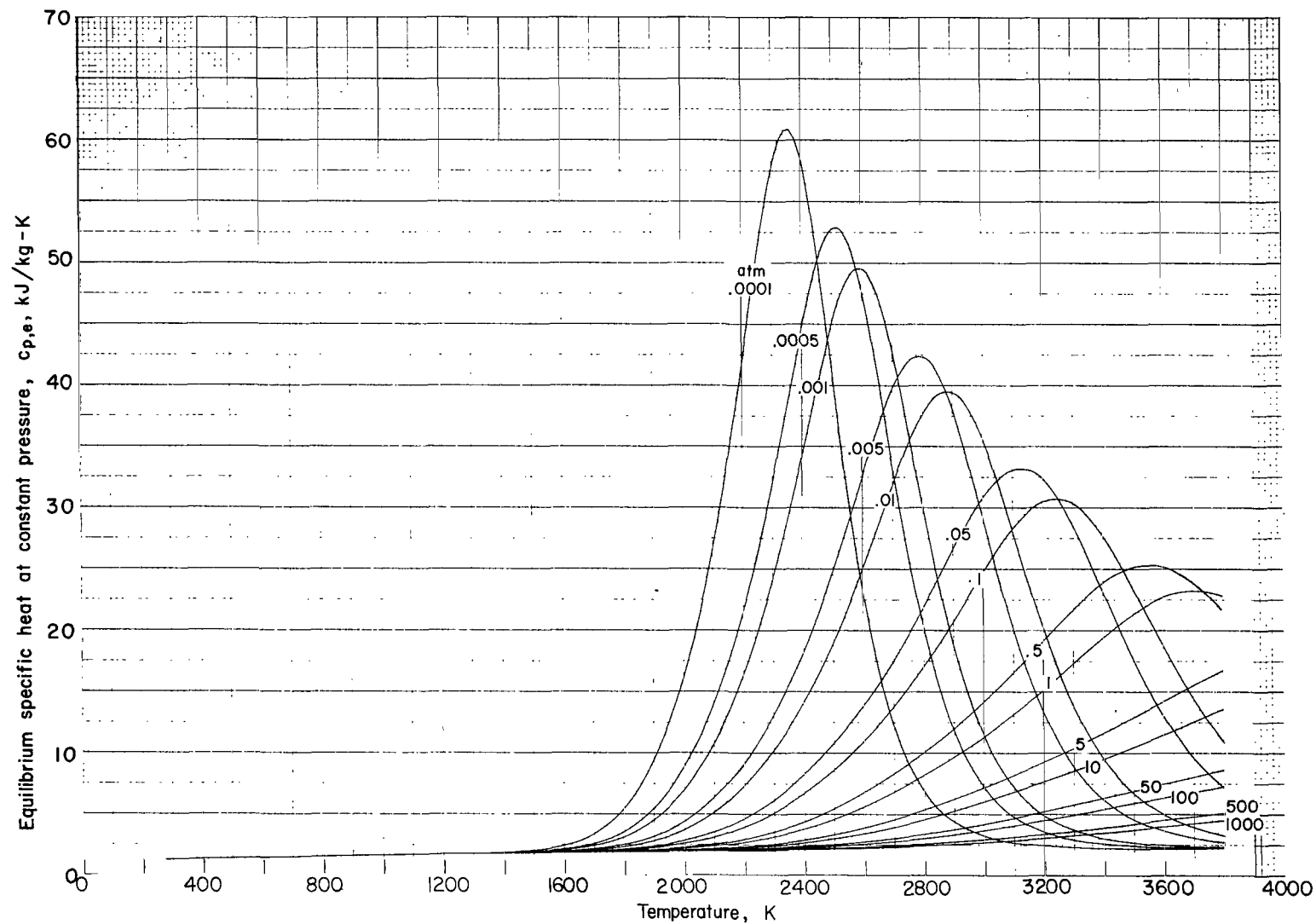(f) Isentropic exponent as a function of temperature at various pressures.
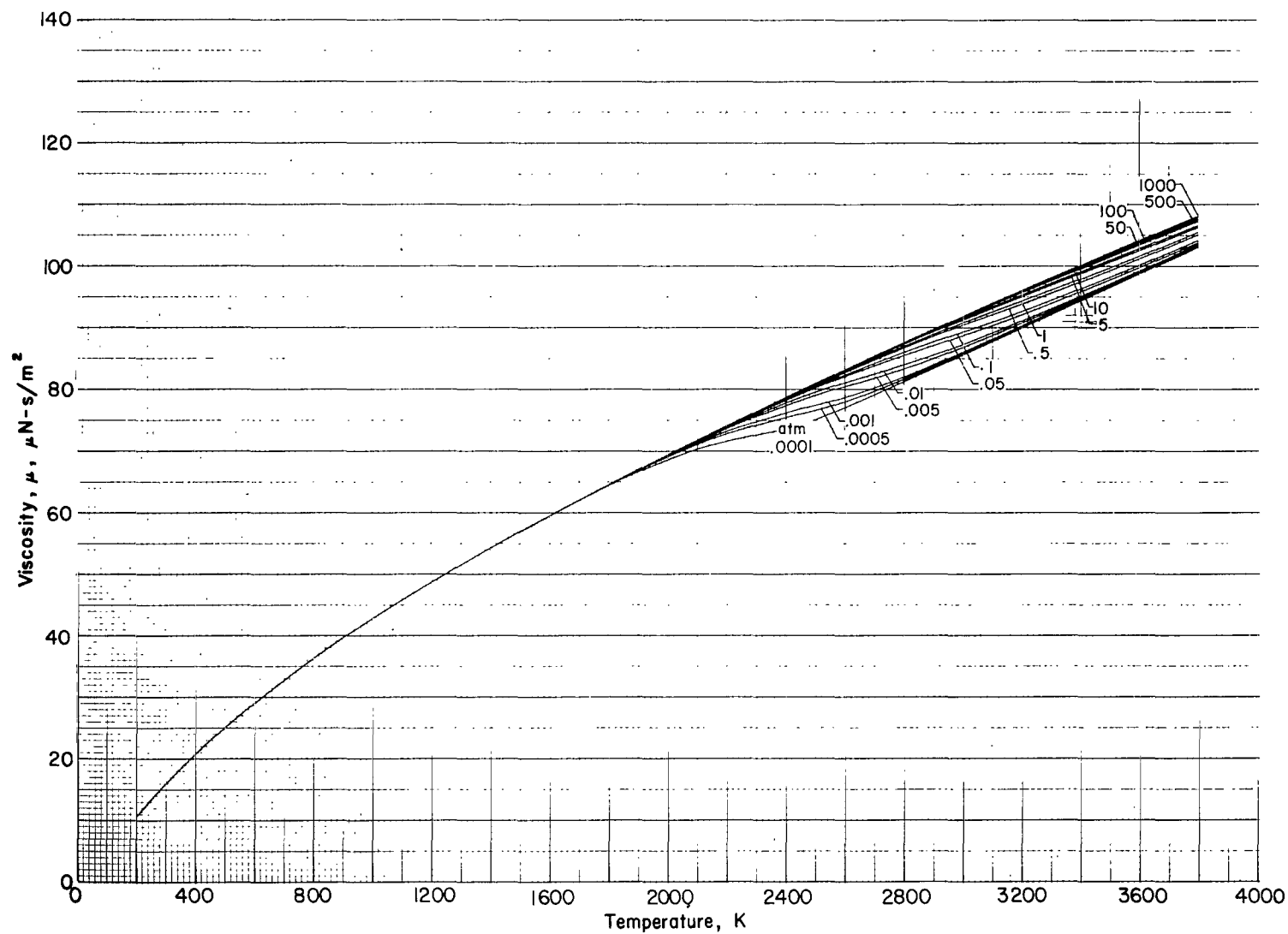
Figure 3.- Continued.

(g) Viscosity as a function of temperature for various pressures.
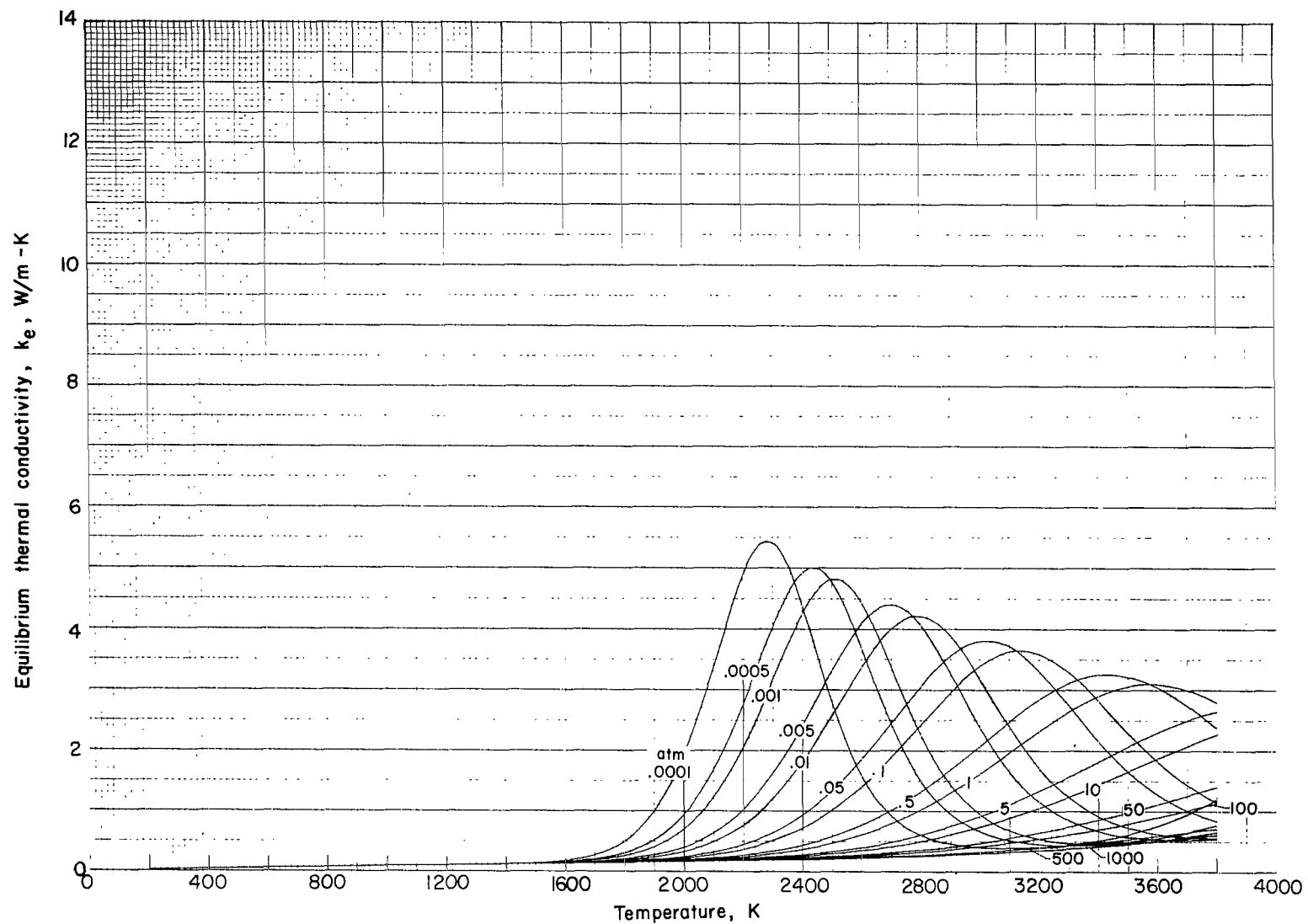
Figure 3.- Continued.

(h) Equilibrium thermal conductivity as a function of temperature for various pressures.
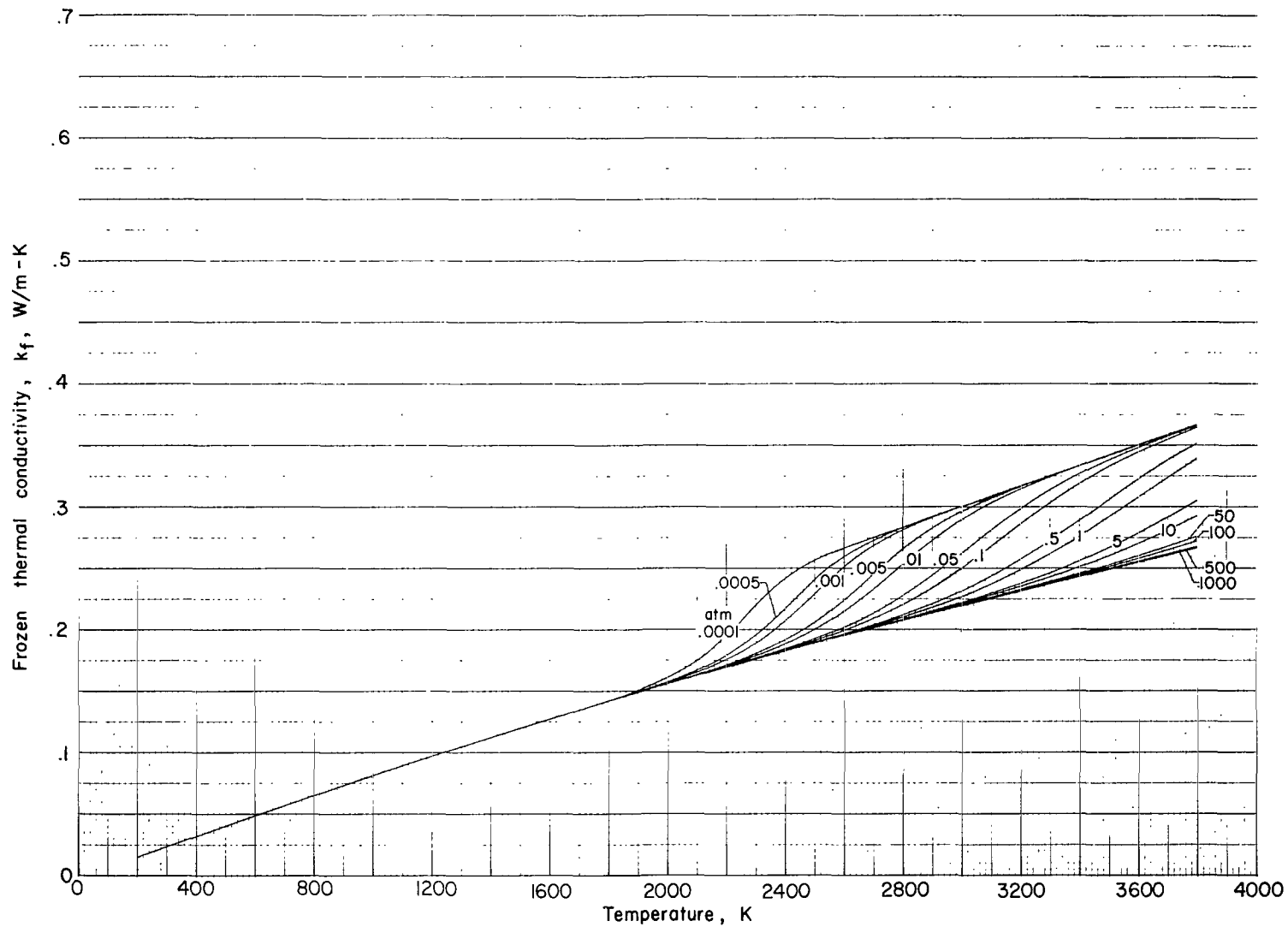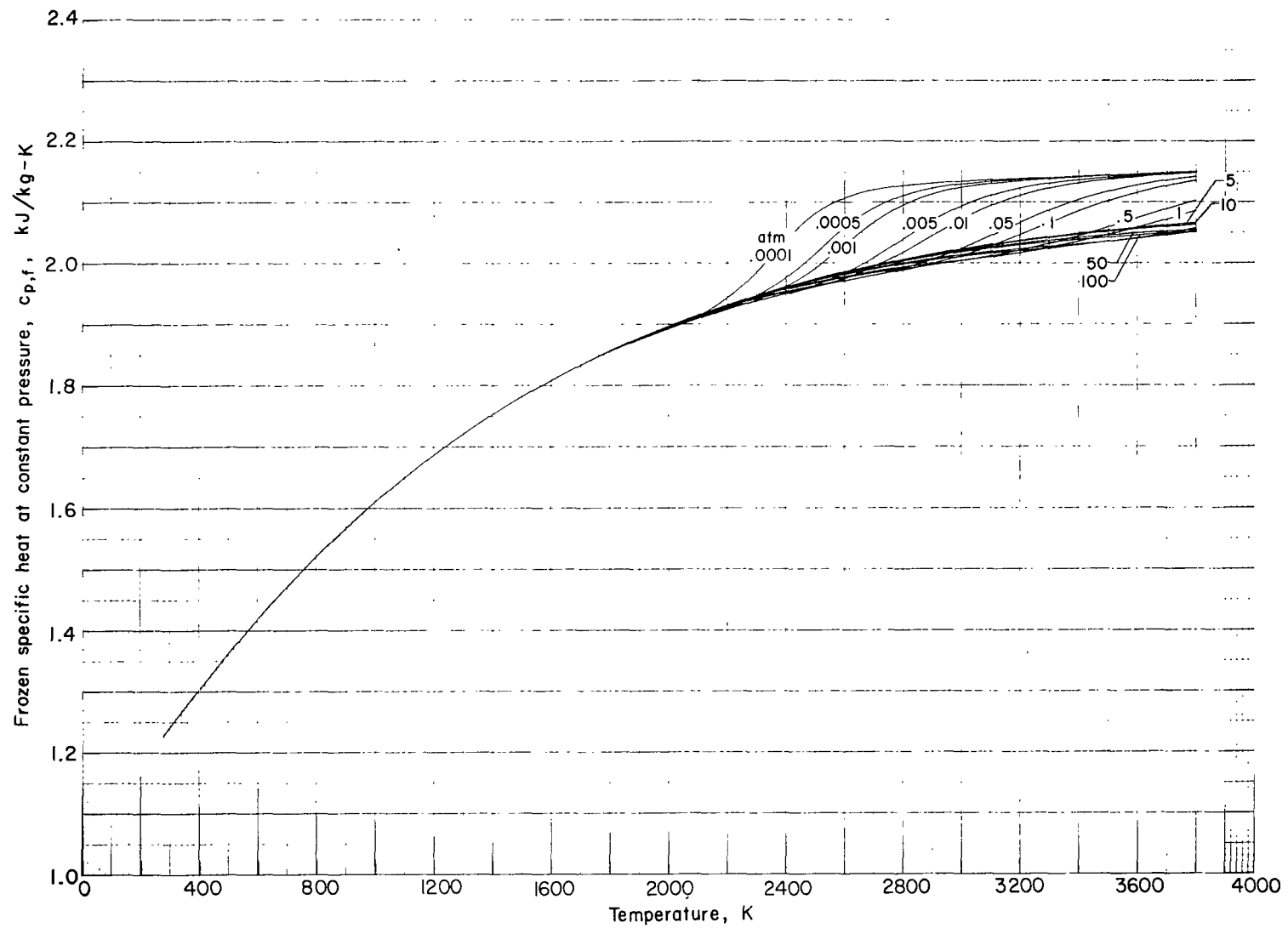
Figure 3.- Continued.

(i) Frozen thermal conductivity as a function of temperature for various pressures.
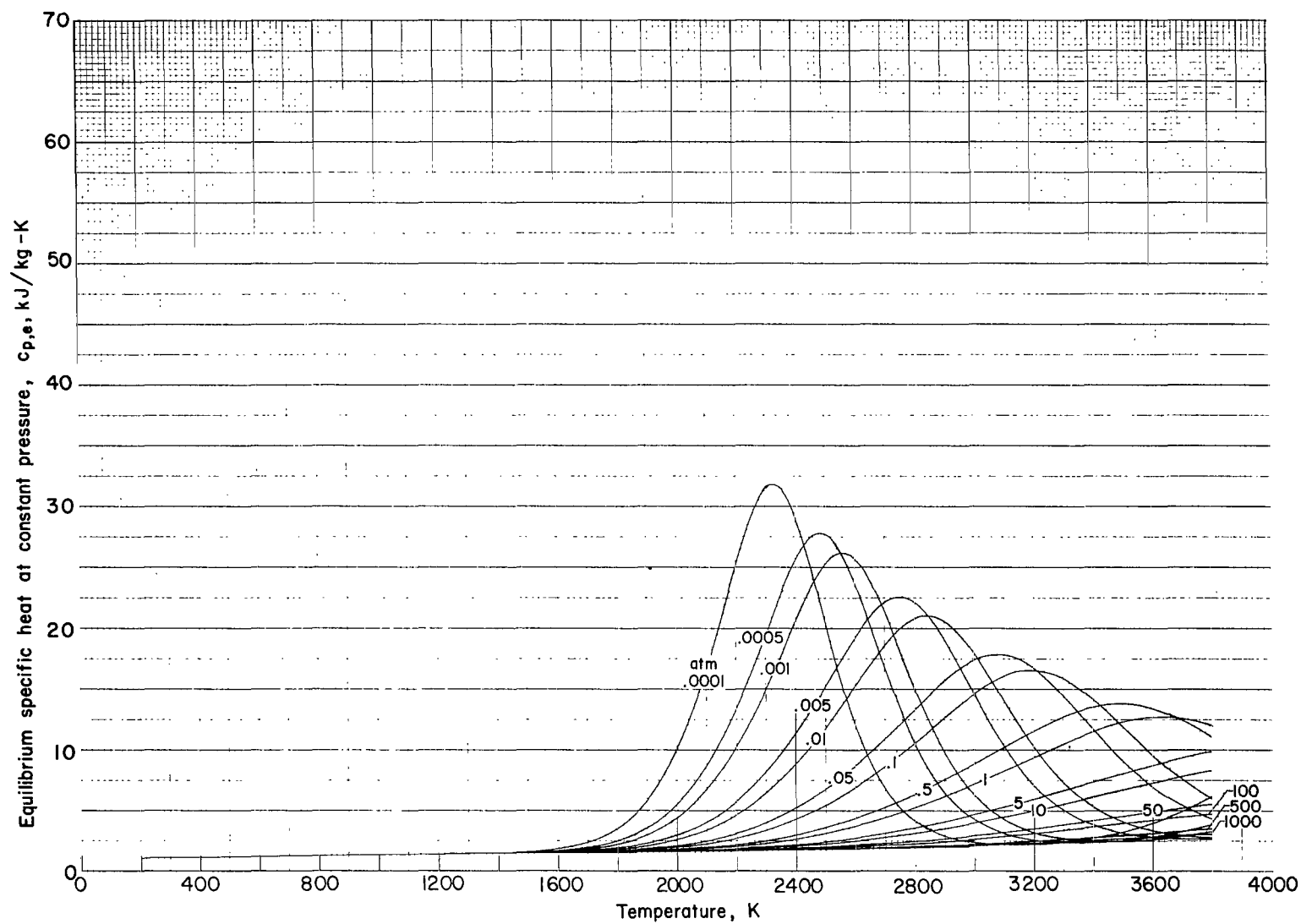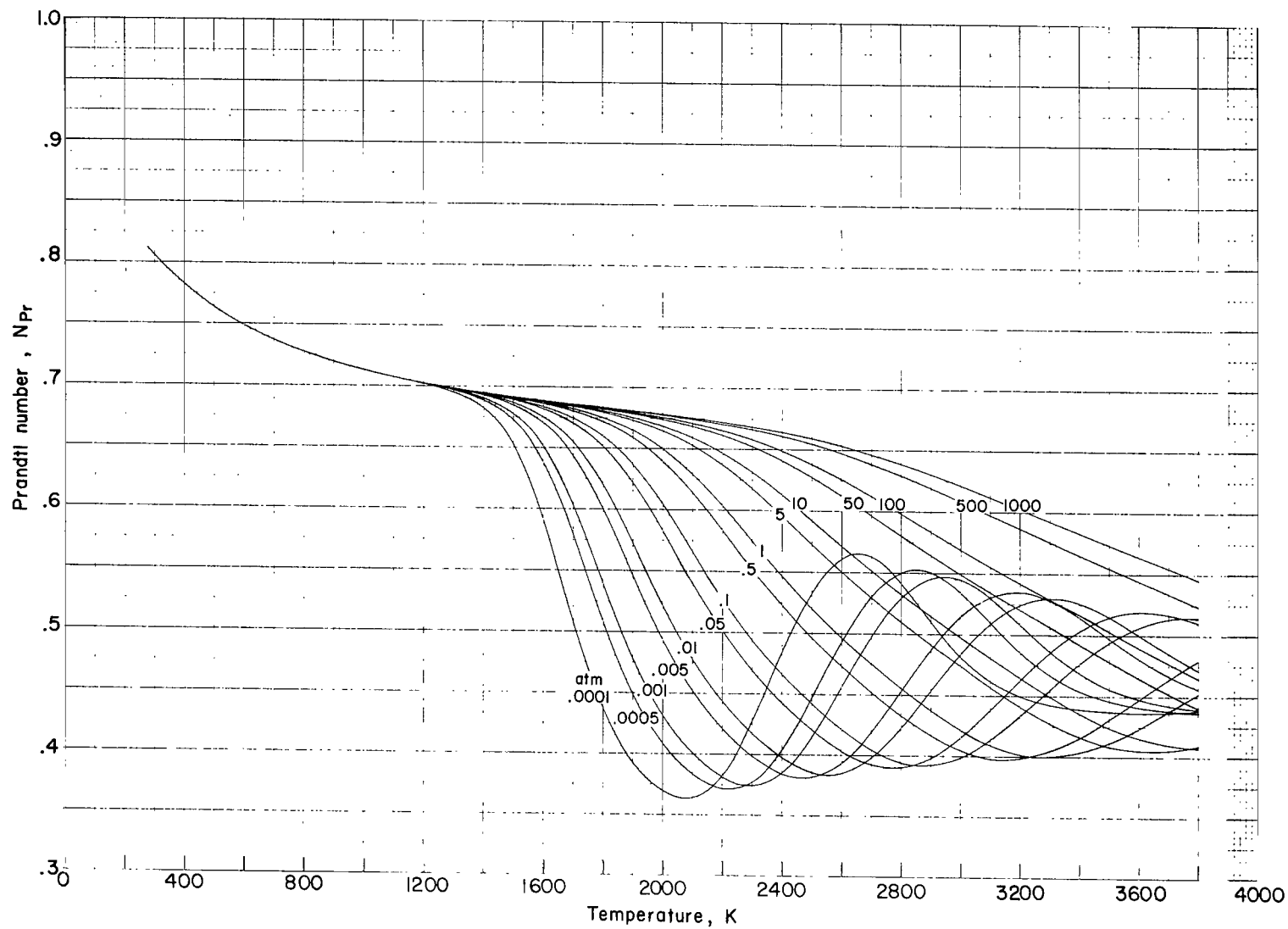
Figure 3.- Continued.

(j) Equilibrium specific heat as a function of temperature for various pressures.
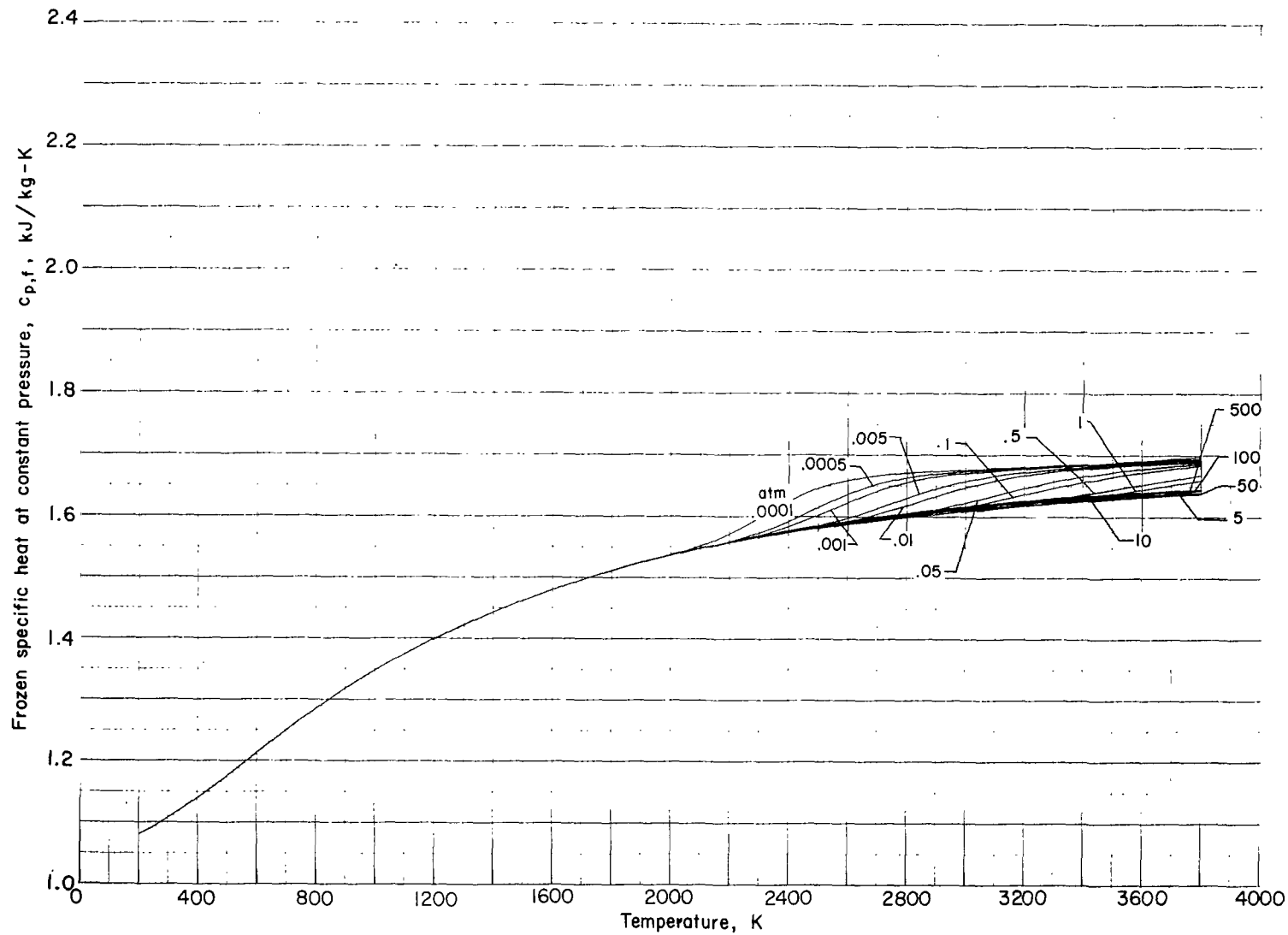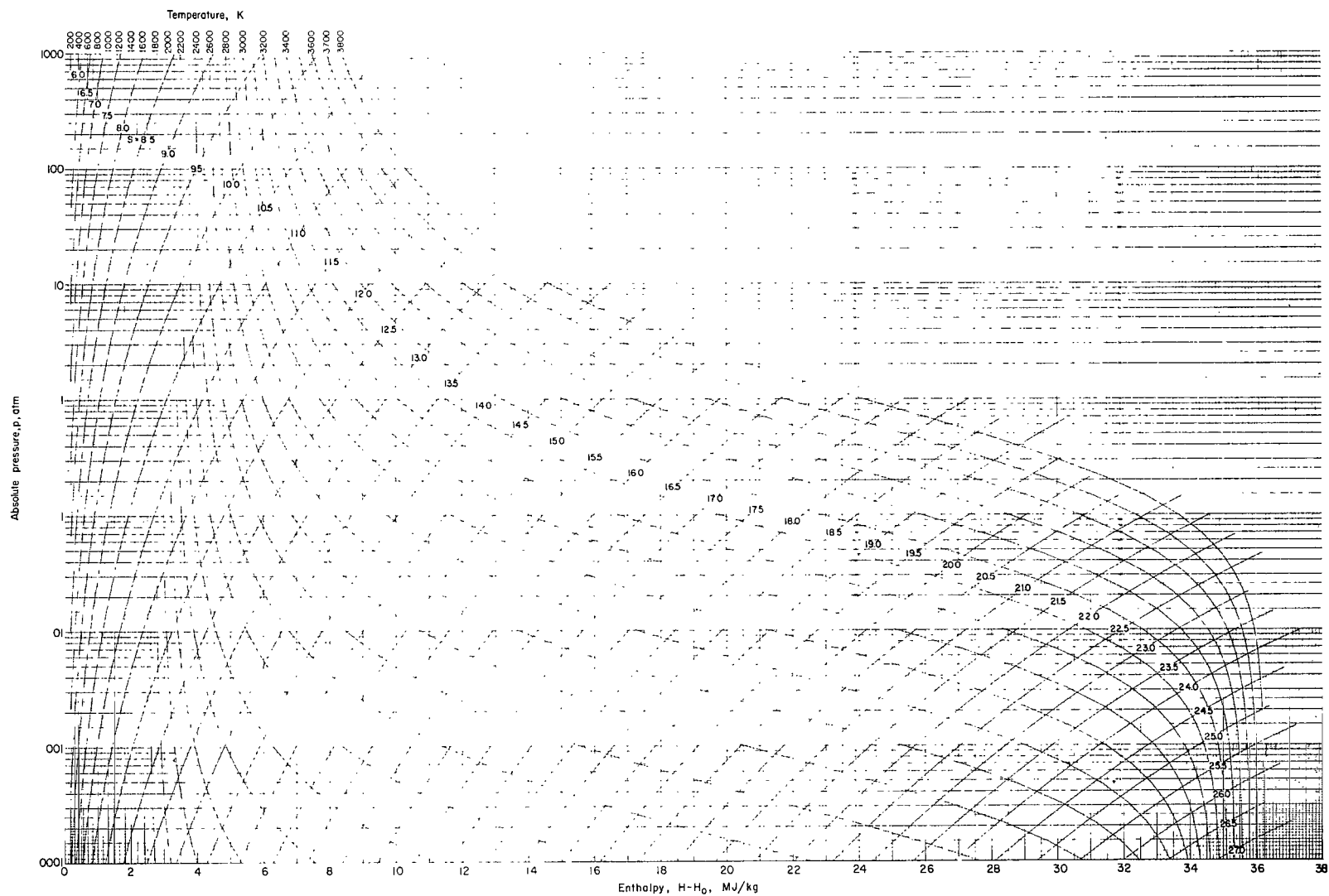
Figure 3.- Continued.

(k) Frozen specific heat as a function of temperature for various pressures.
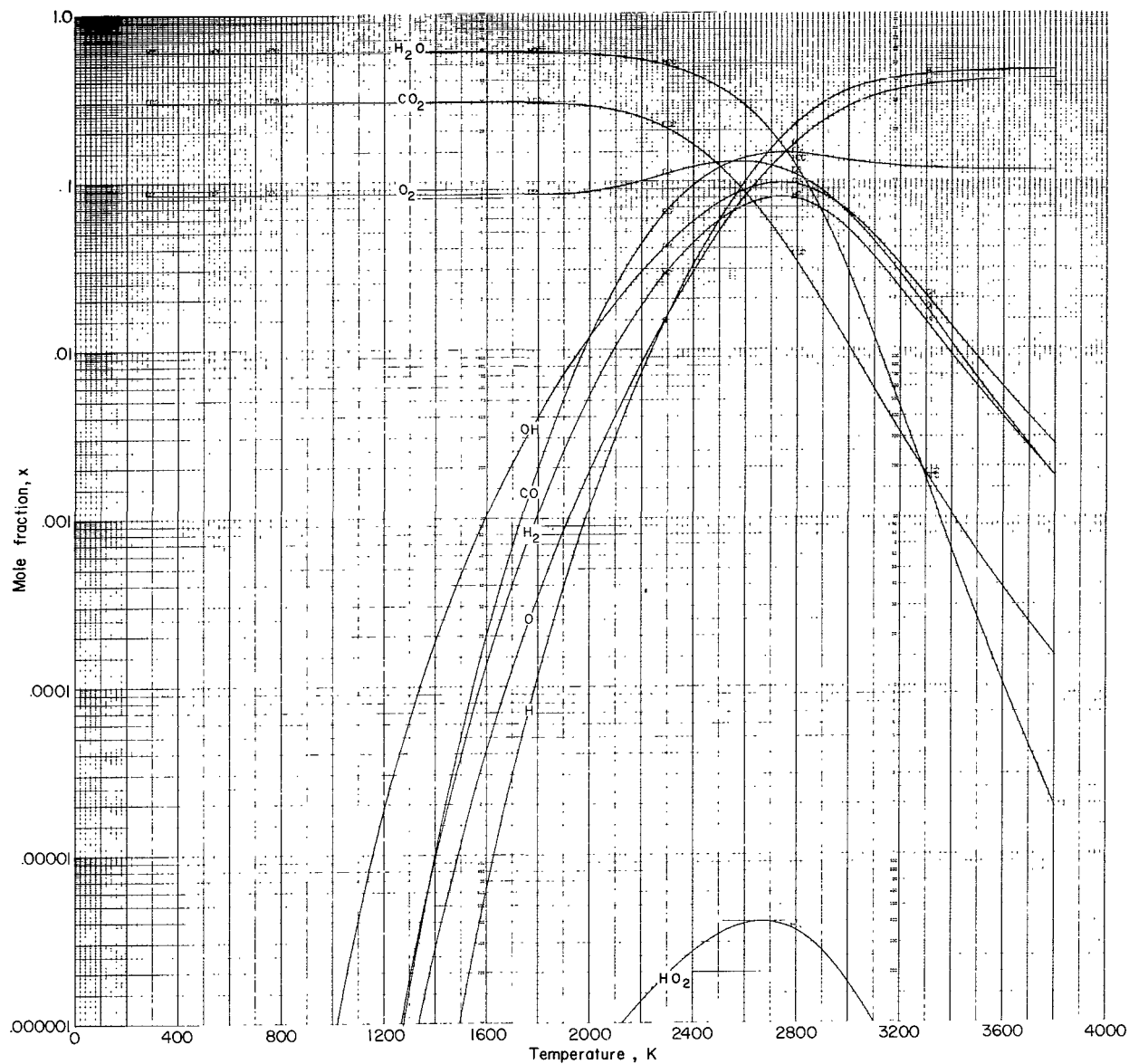
Figure 3.- Continued.
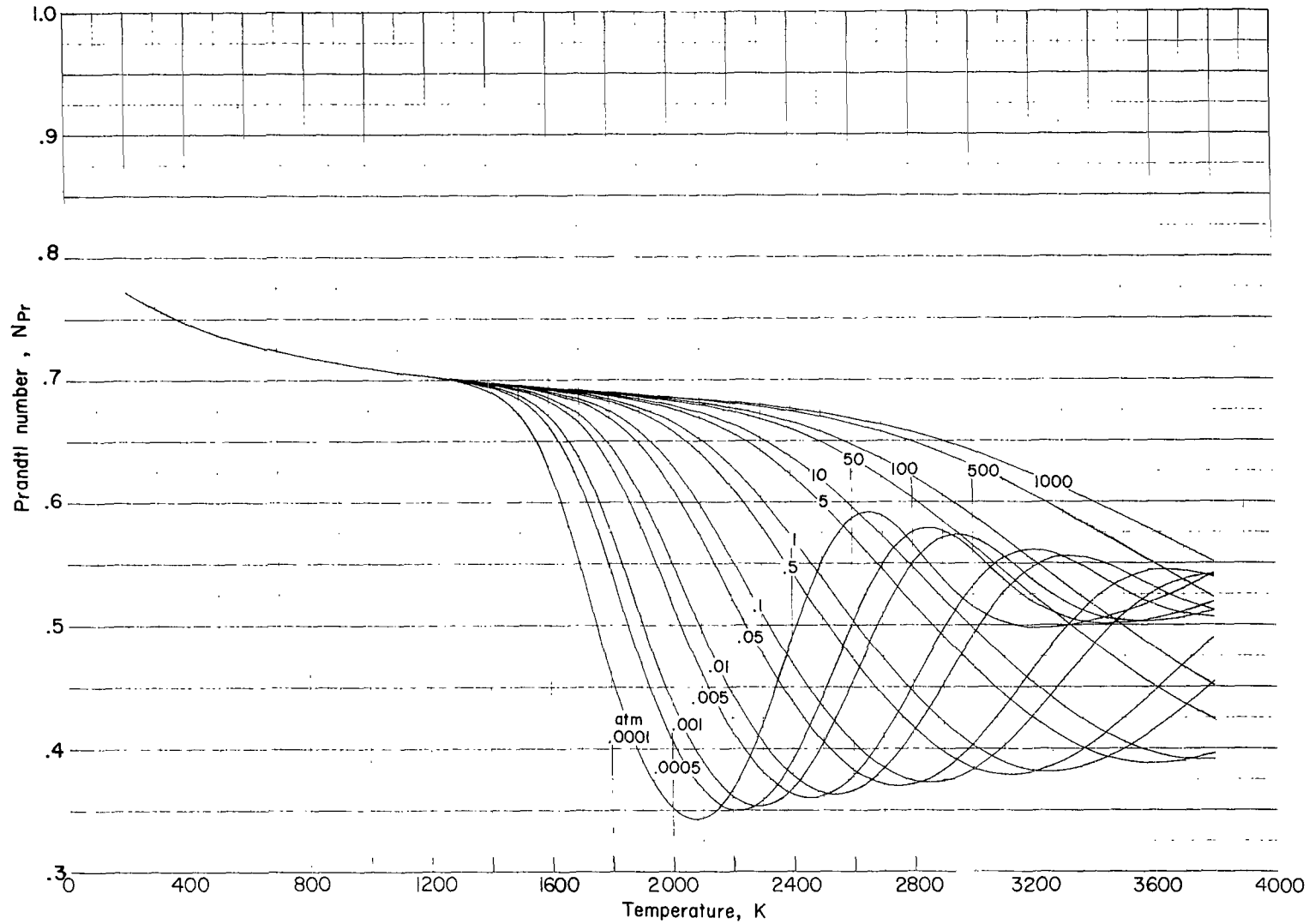
(1) Prandtl number as a function of temperature for various pressures.

Figure 3.- Concluded.
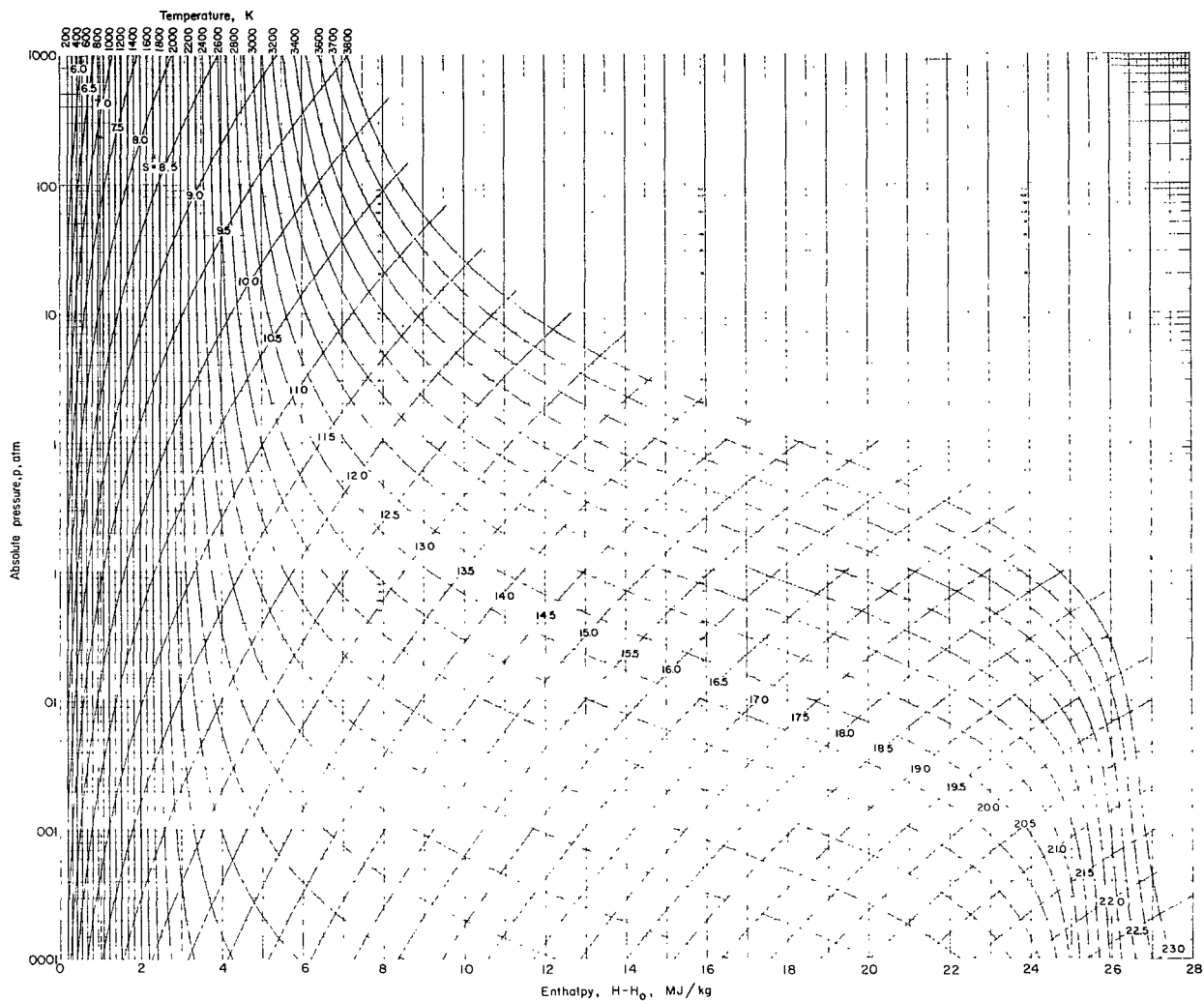
(a) Pressure-enthalpy diagram with lines of constant temperature.

Figure 4.- Thermodynamic and transport properties of products from
methane-air-oxygen combustion (mixture B).
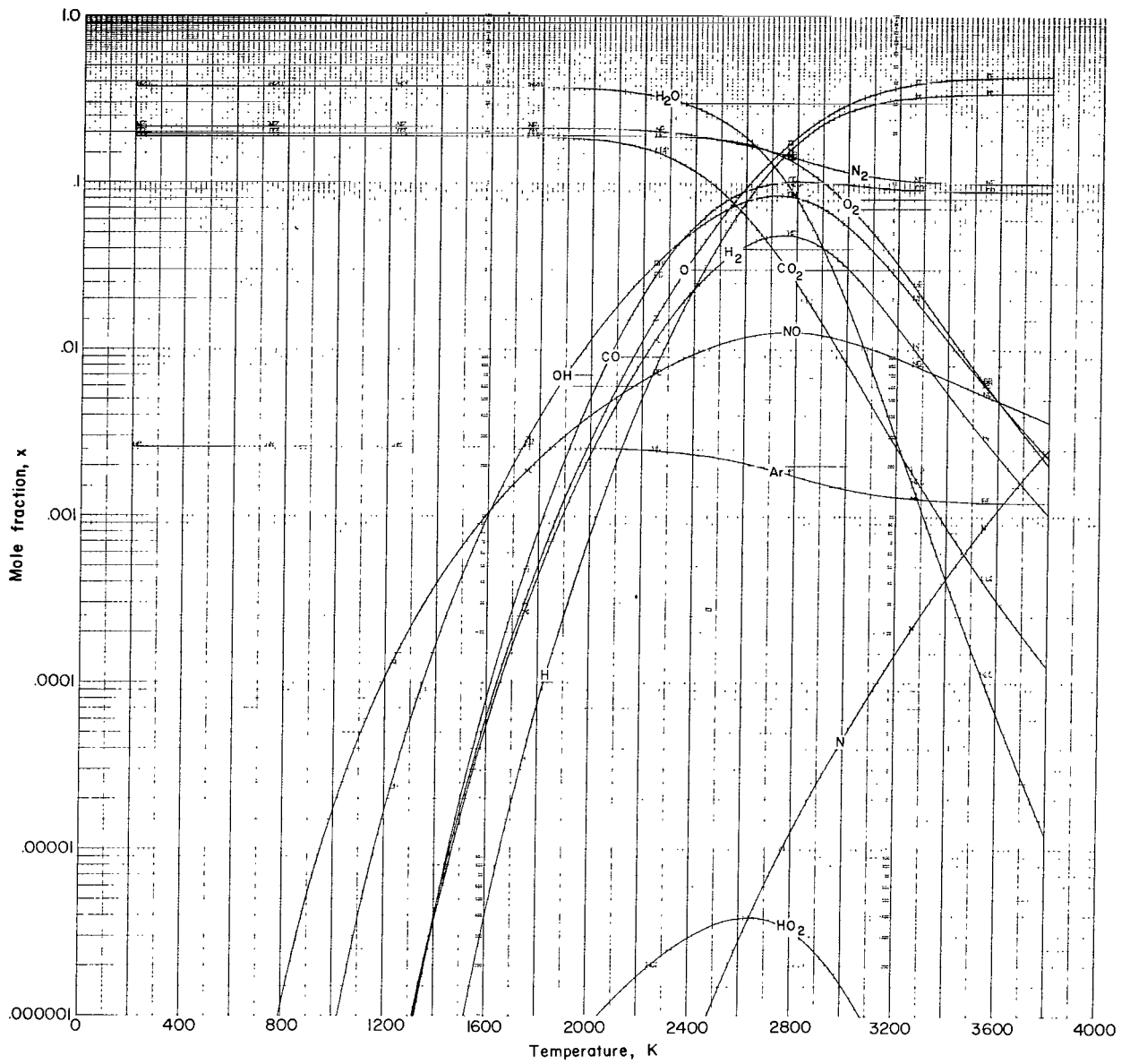
(b) Variation of composition with temperature at p = 0.01 atm.
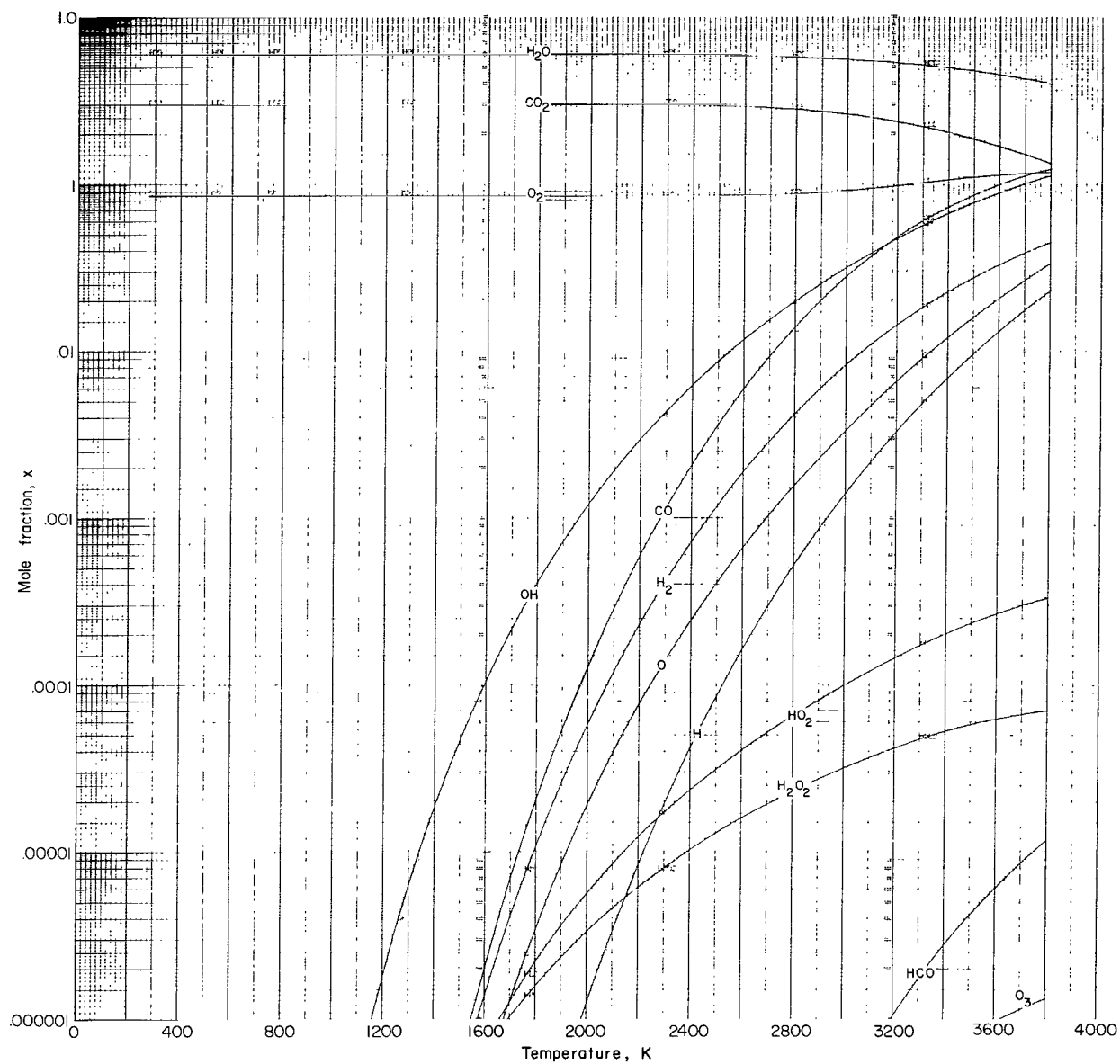
Figure 4.- Continued.

Mole fraction, x
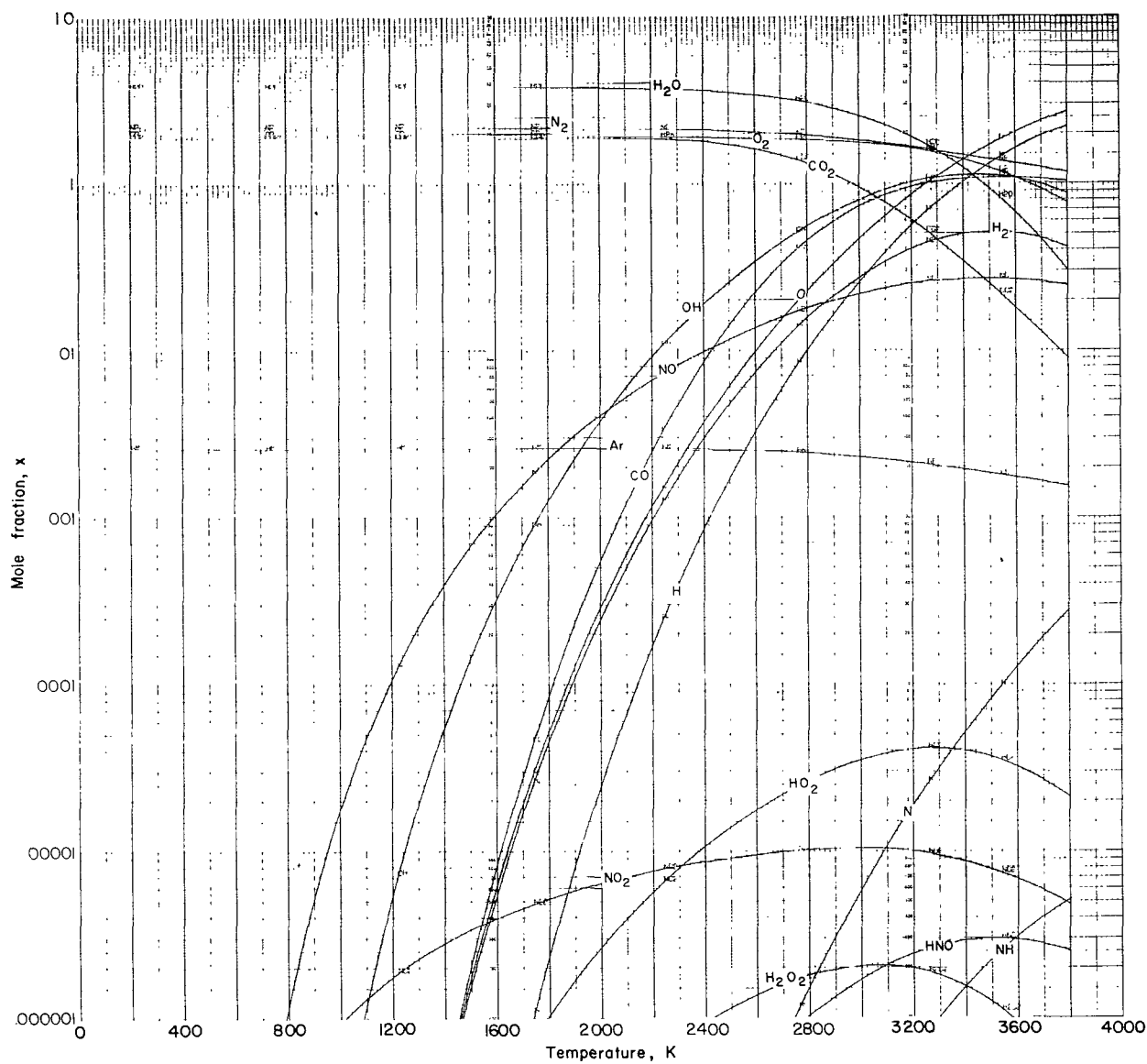
Temperature, K

(c) Variation of composition with temperature at   p = 1.0 atm.
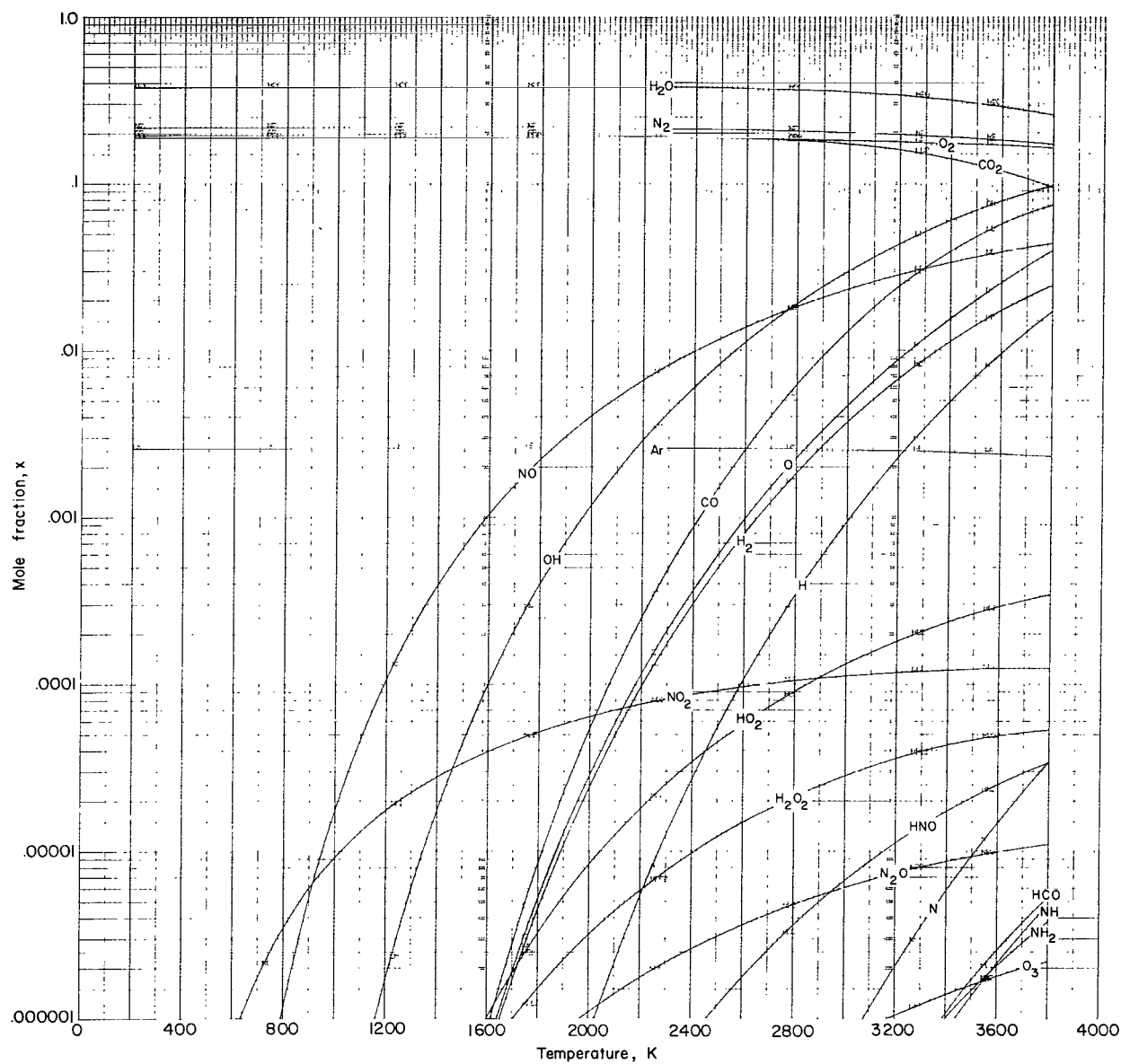
Figure 4.- Continued.

(d) Variation of composition with temperature at $p = 100$ atm.

Figure 4.- Continued.
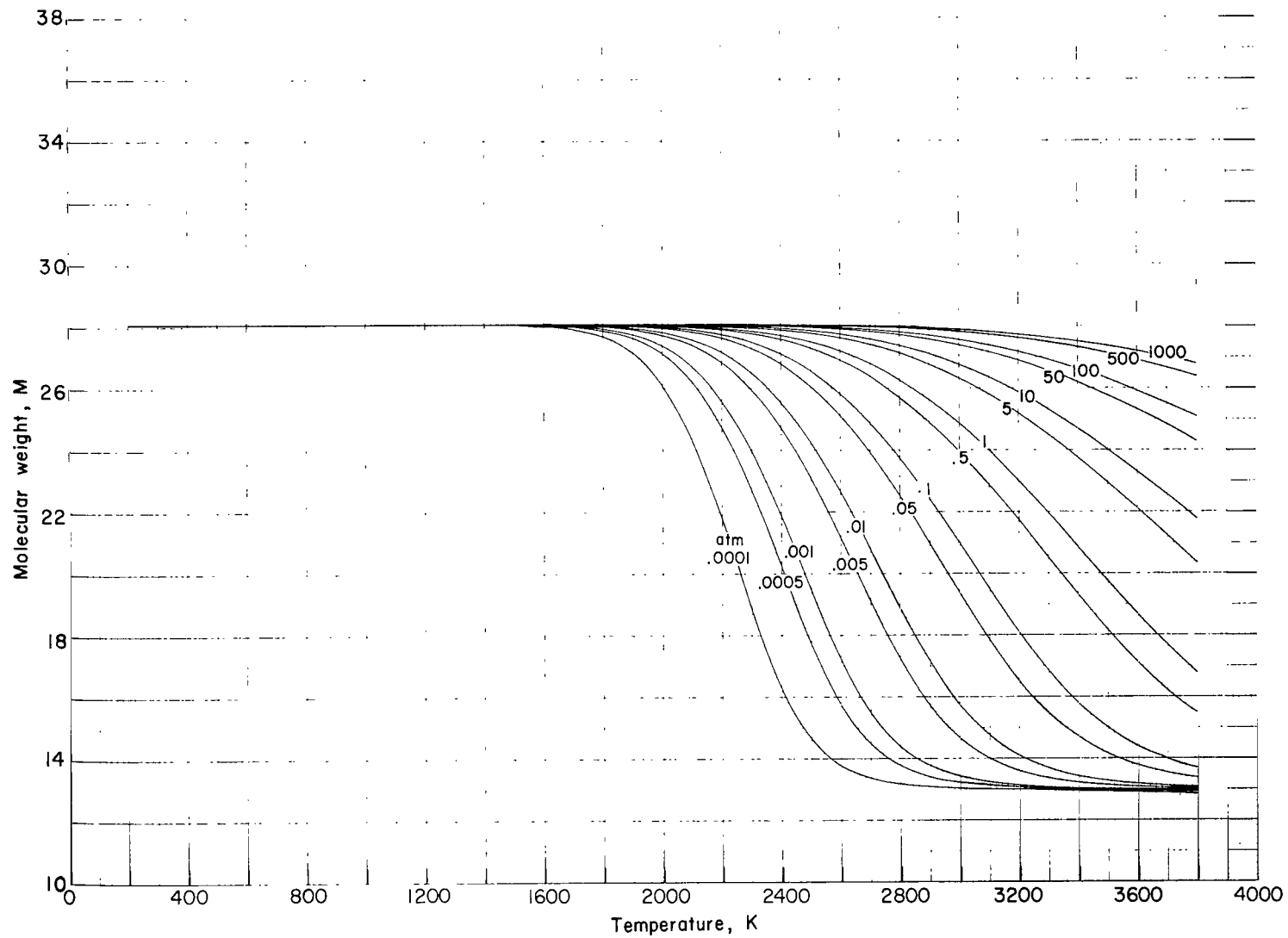
(e) Molecular weight as a function of temperature for various pressures.
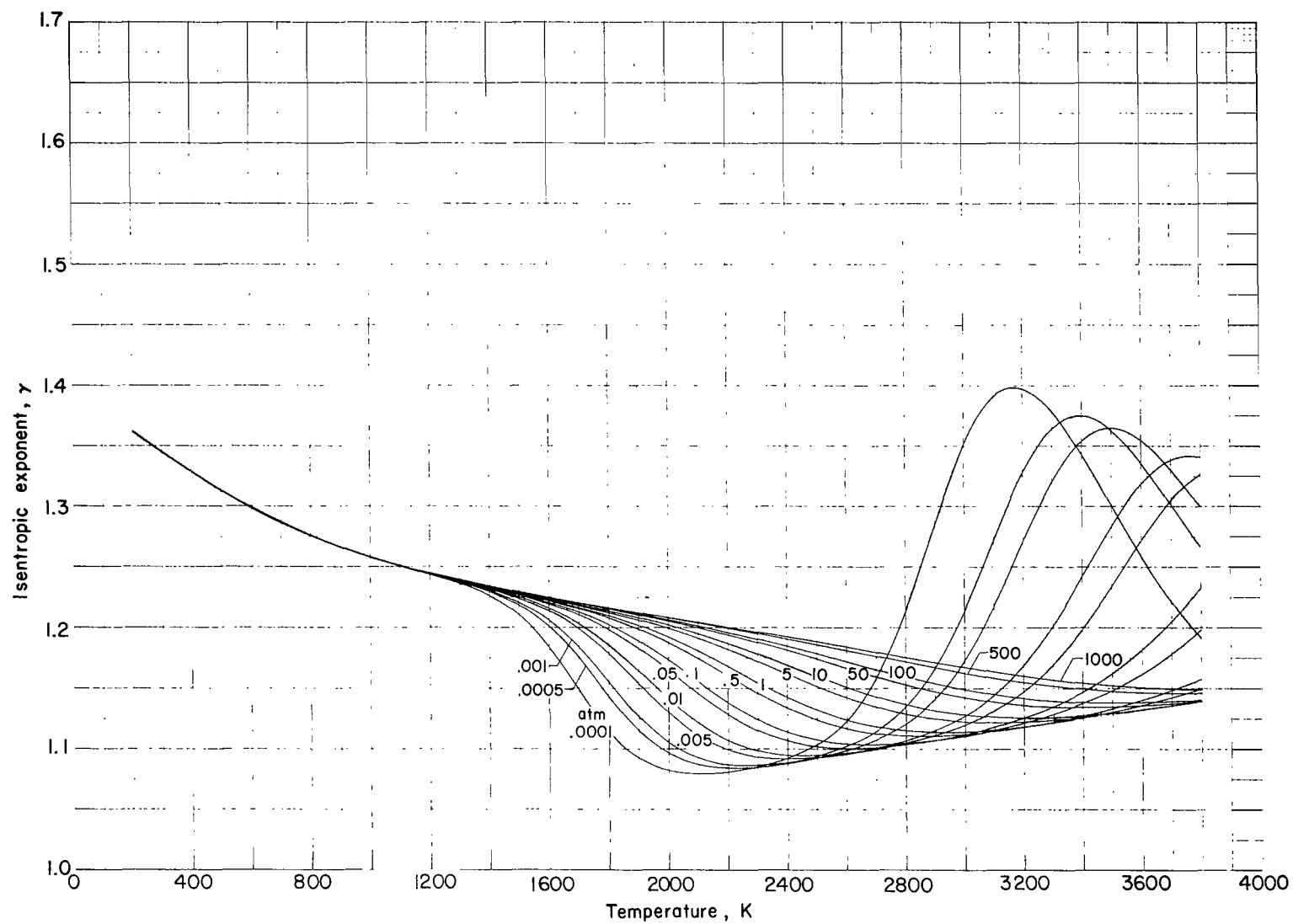
Figure 4.- Continued.

(f) Isentropic exponent as a function of temperature for various pressures.
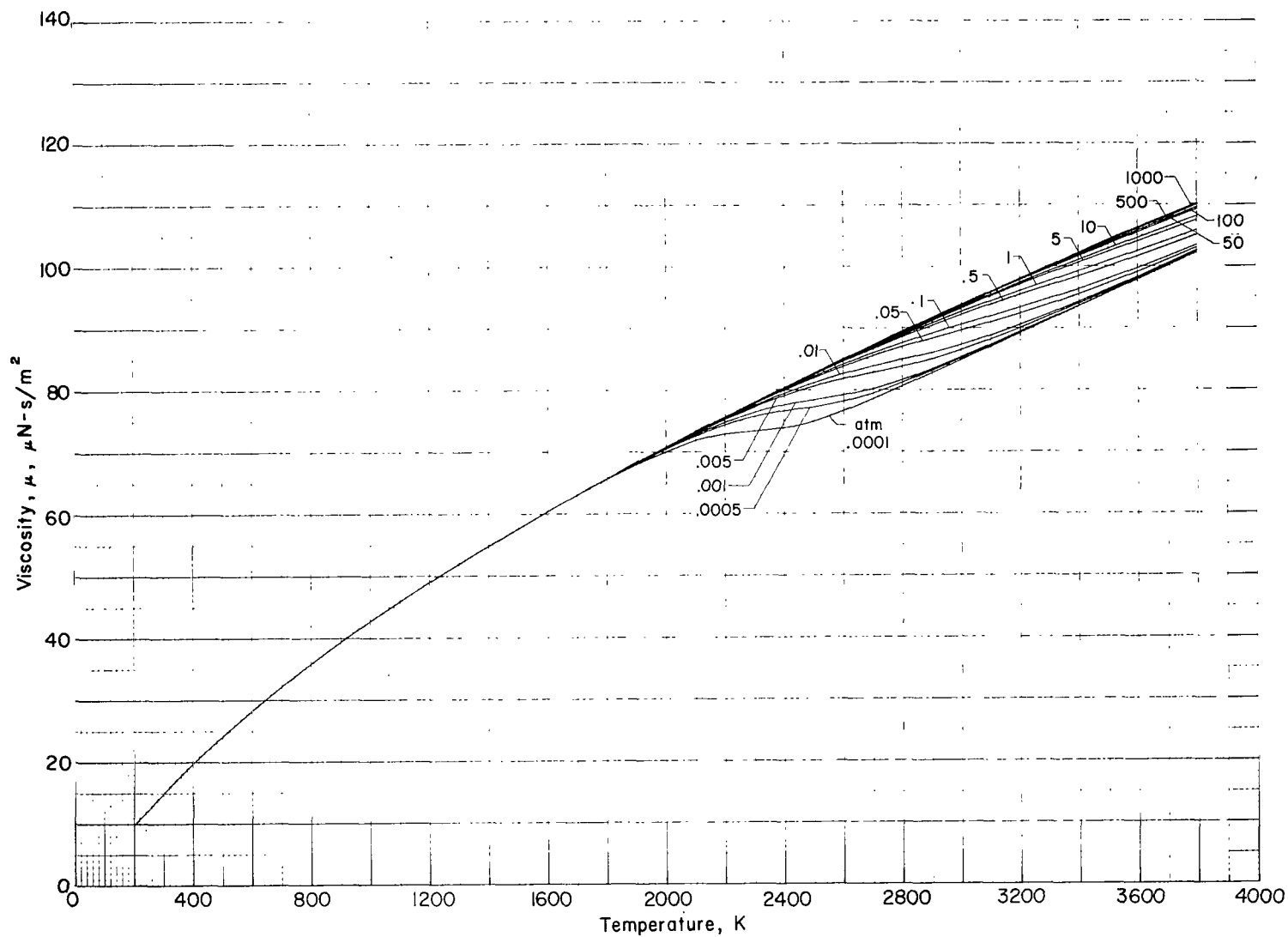
Figure 4.- Continued.

(g) Viscosity as a function of temperature for various pressures.
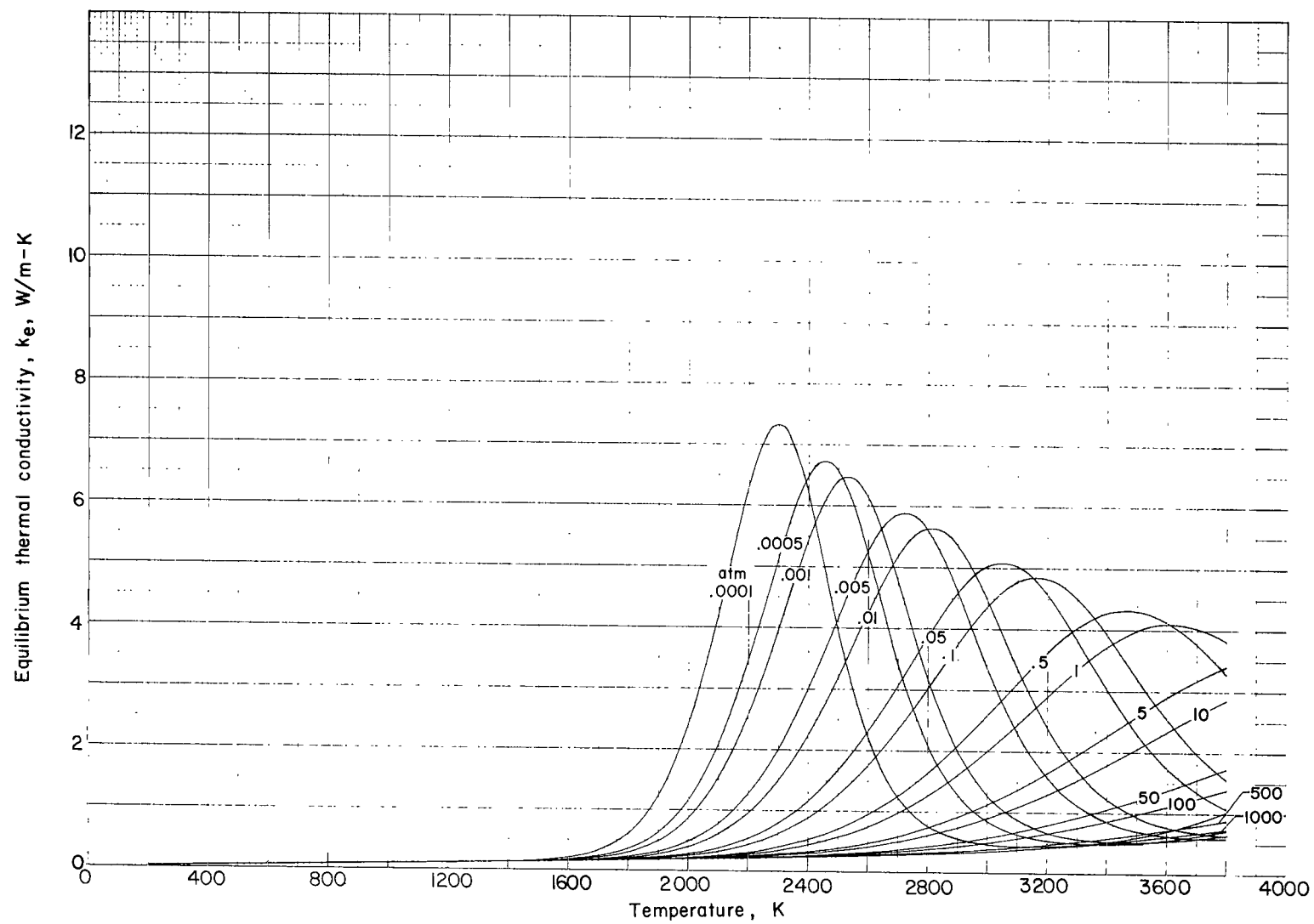
Figure 4.- Continued.

(h) Equilibrium thermal conductivity as a function of temperature for various pressures.
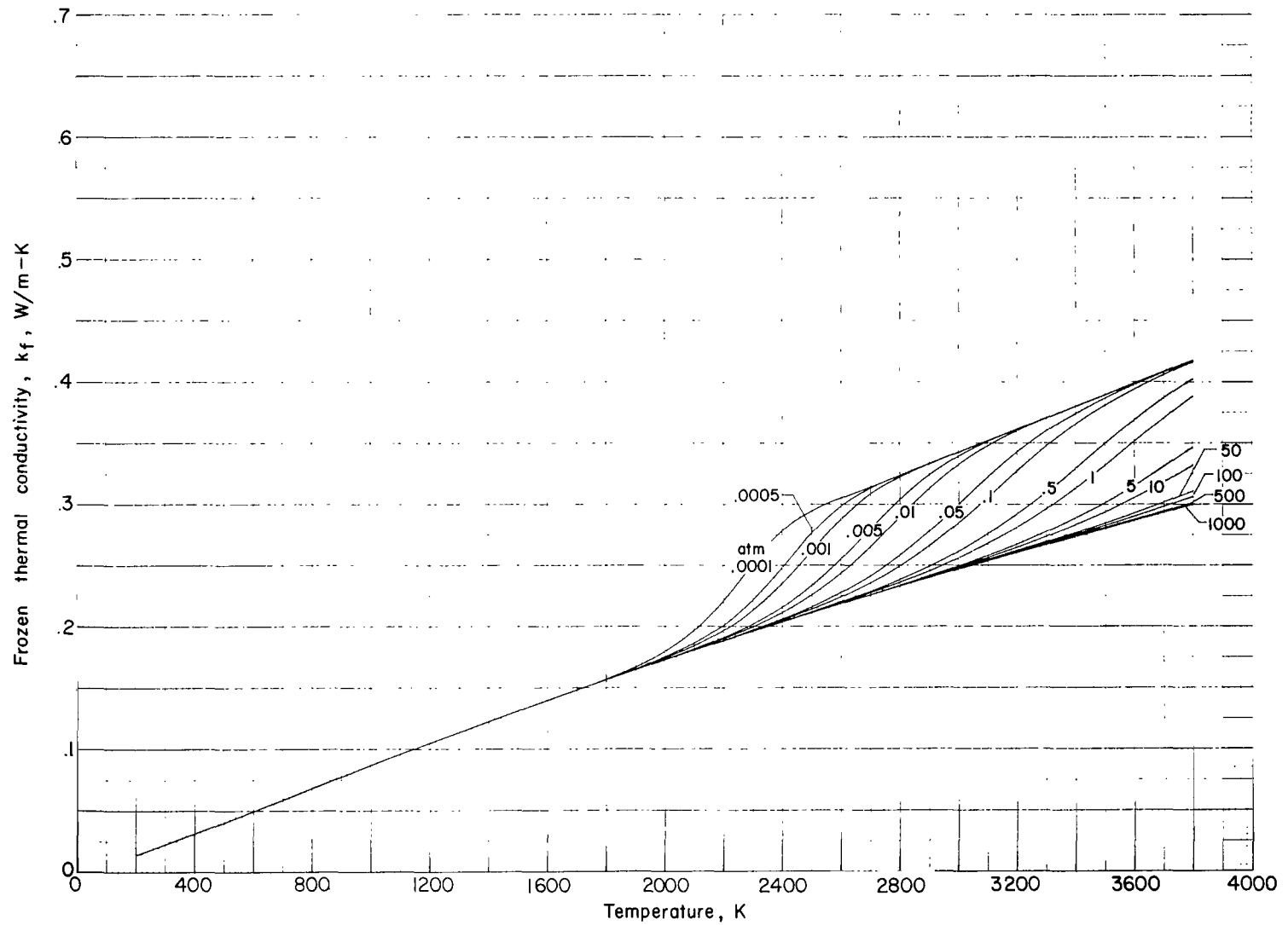
Figure 4.- Continued.

(i) Frozen thermal conductivity as a function of temperature for various pressures.
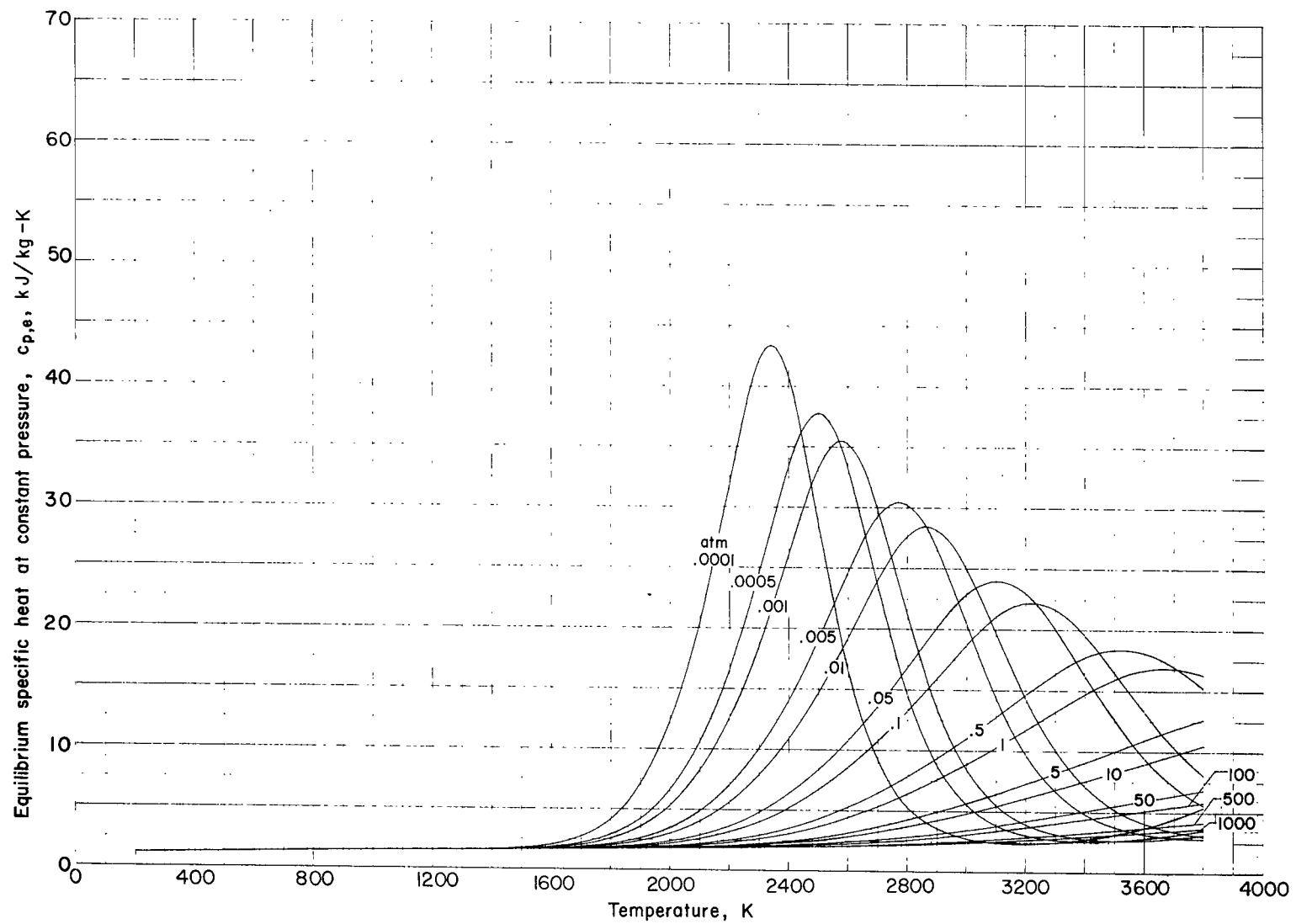
Figure 4.- Continued.

(j) Equilibrium specific heat as a function of temperature for various pressures.
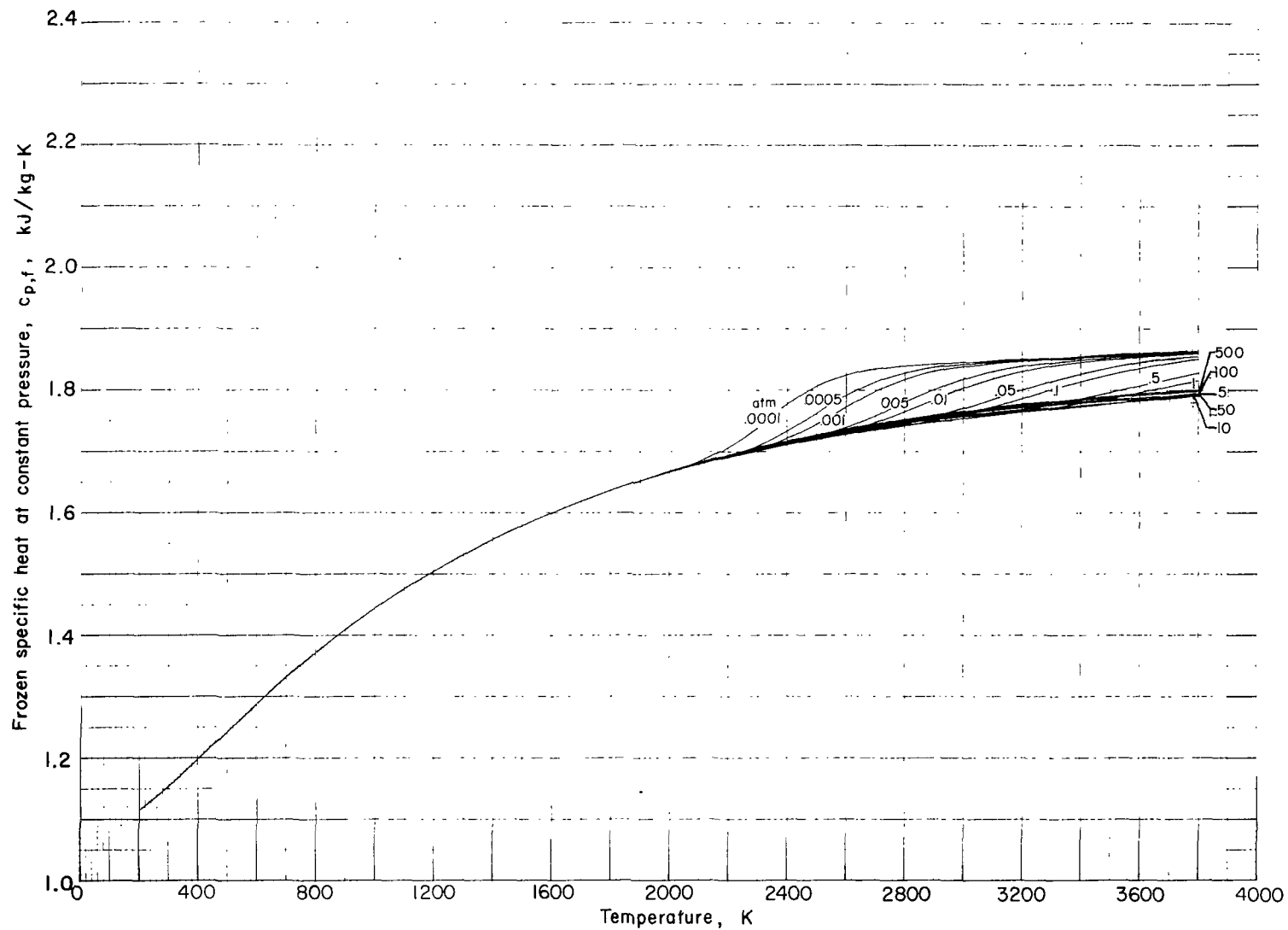
Figure 4.- Continued.

(k) Frozen specific heat as a function of temperature for various pressures.

Figure 4.- Continued.
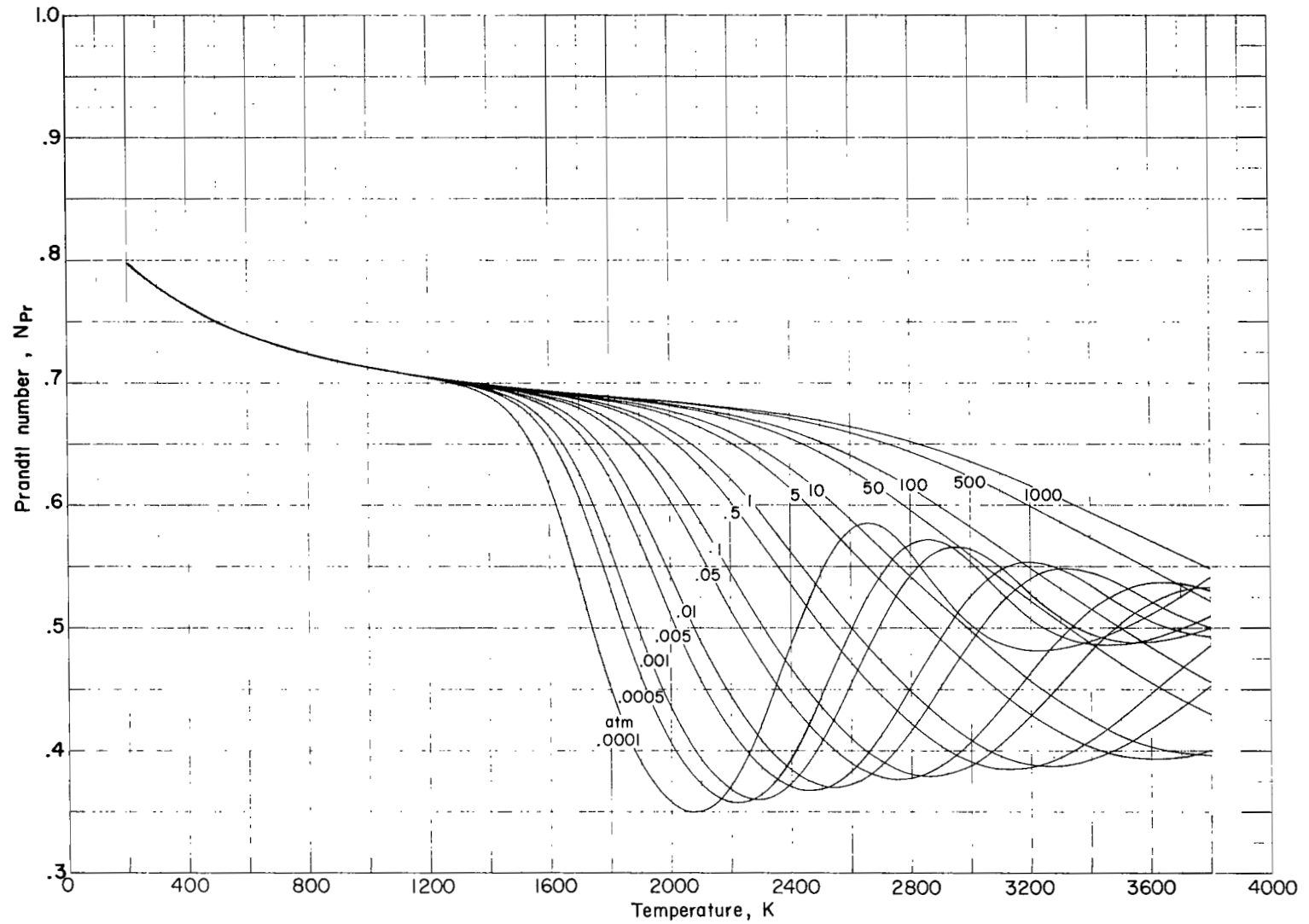
(1) Prandtl number as a function of temperature for various pressures.

Figure 4.- Concluded.
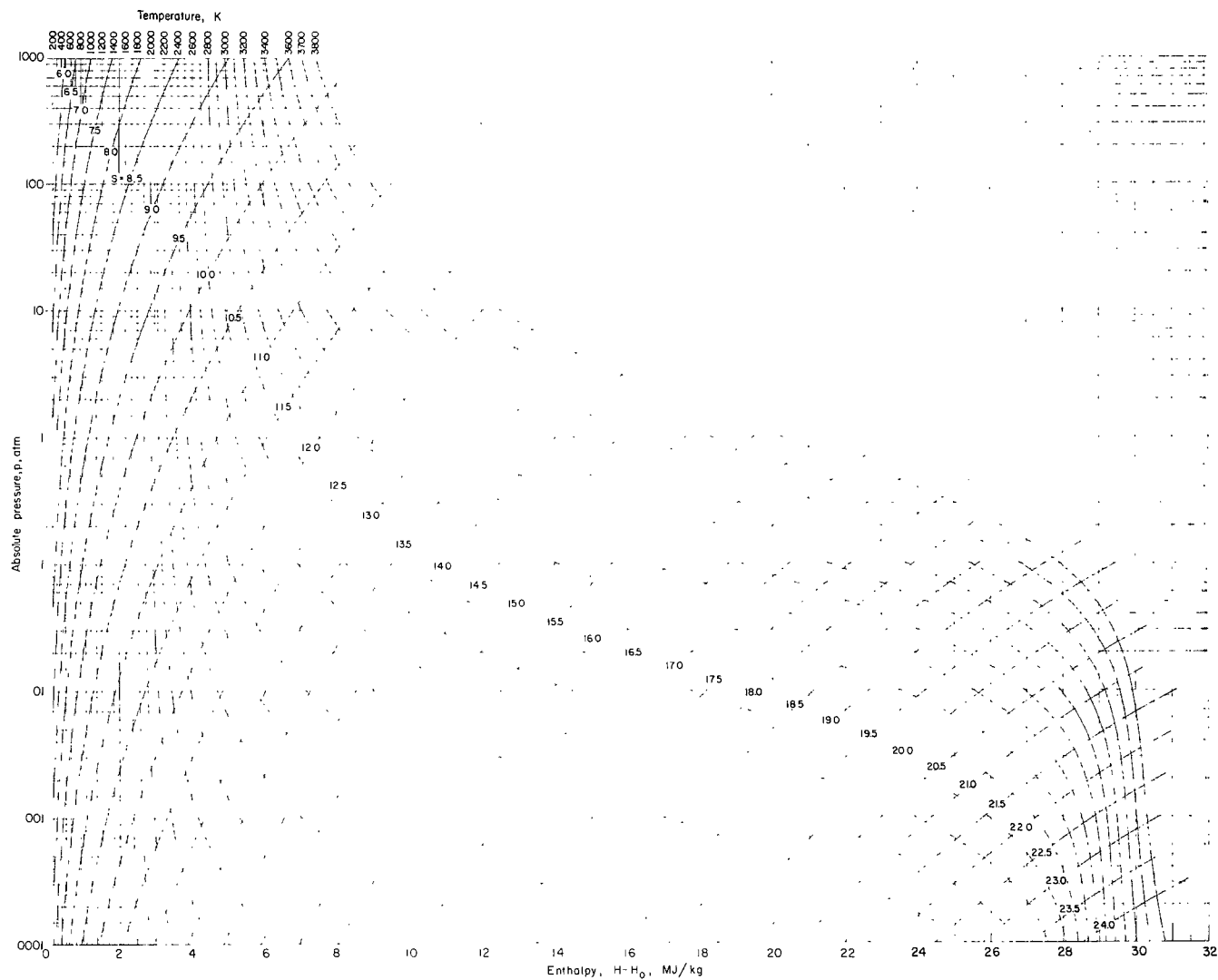
(a) Pressure-enthalpy diagram with lines of constant temperature and entropy.

Figure 5.- Thermodynamic and transport properties of products of methane-air-oxygen combustion (mixture C).
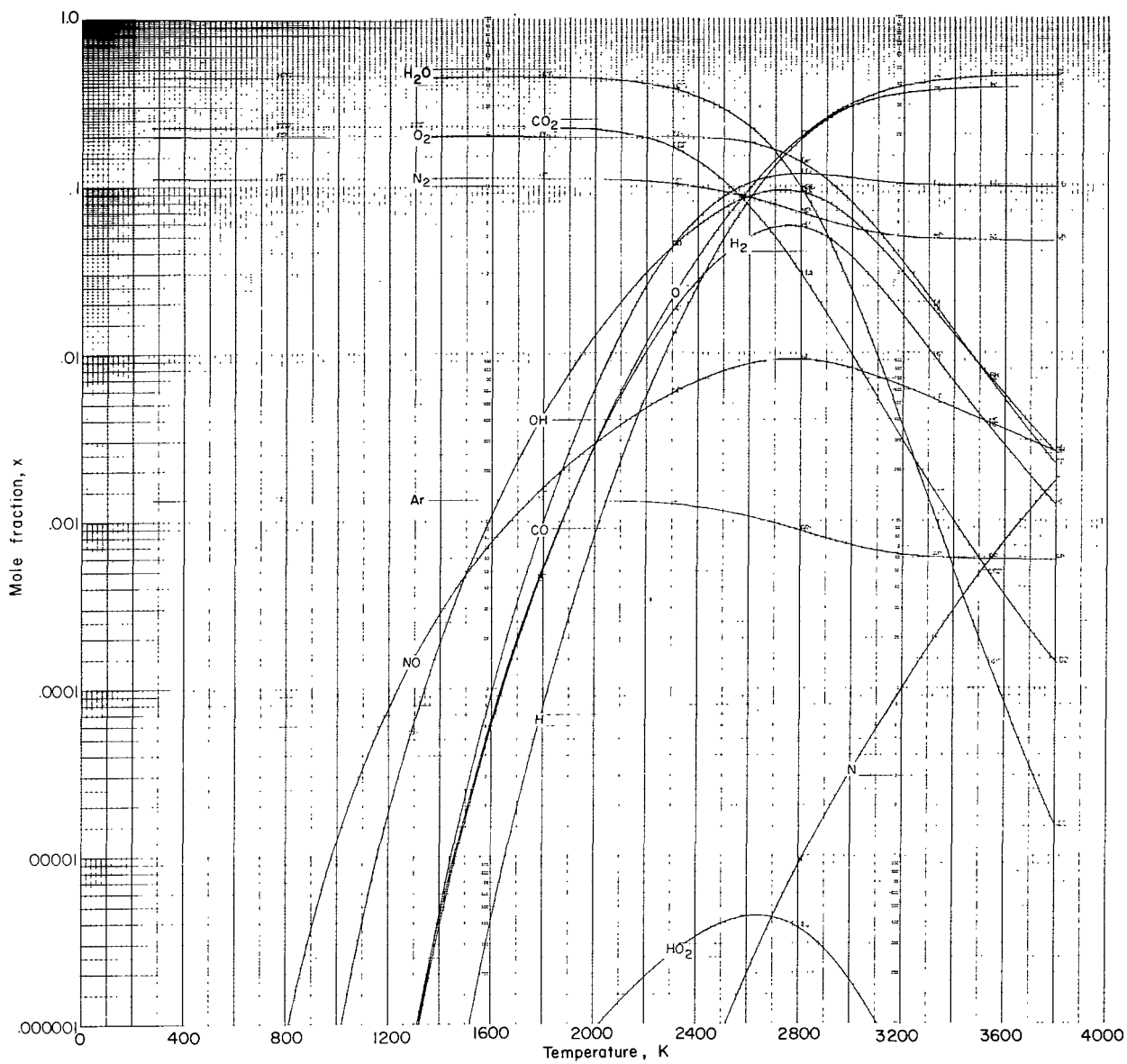
(b) Variation of composition with temperature at   p = 0.01 atm.

Figure 5.- Continued.
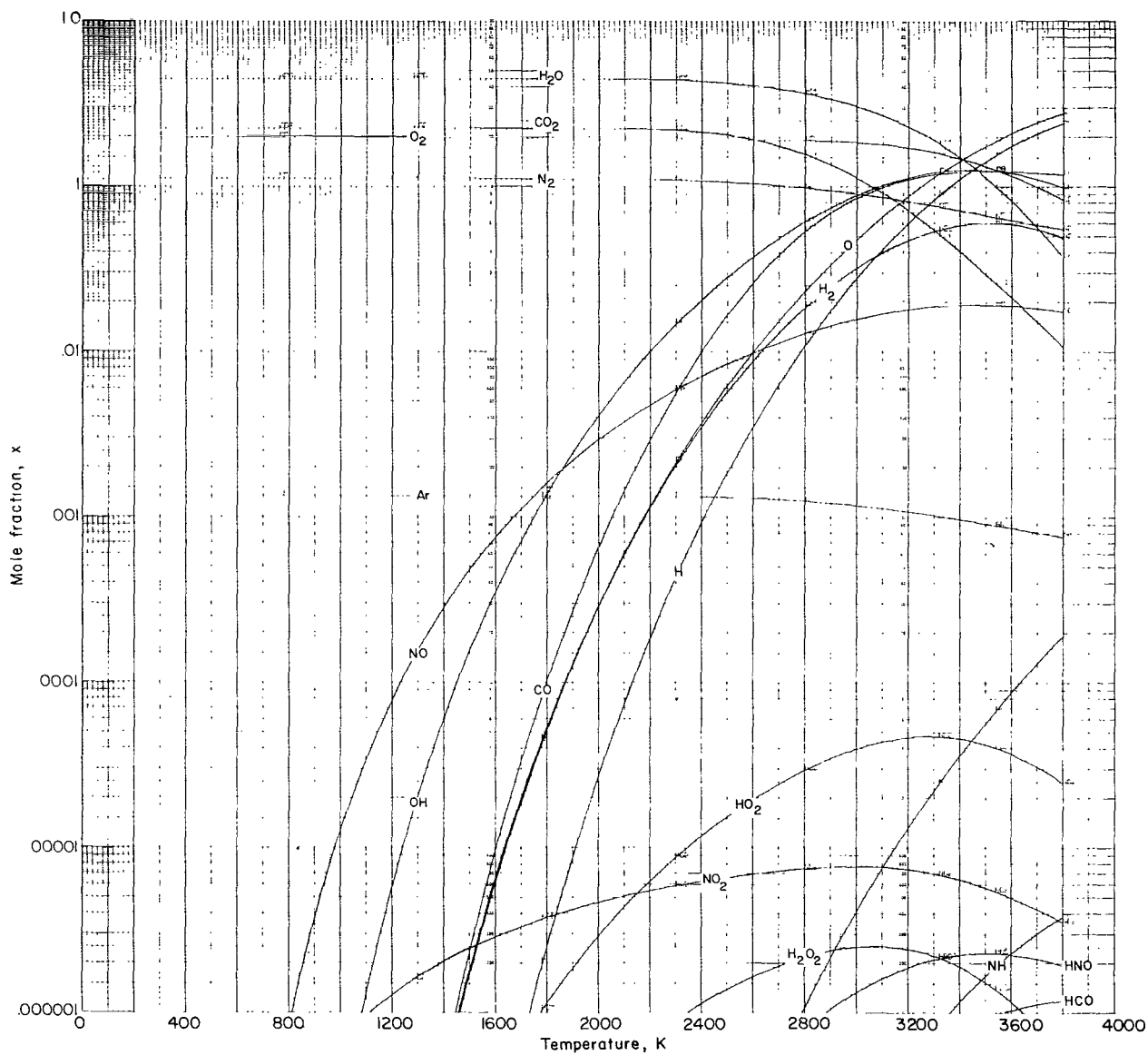
(c) Variation of composition with temperature at p = 1.0 atm.

Figure 5.- Continued.
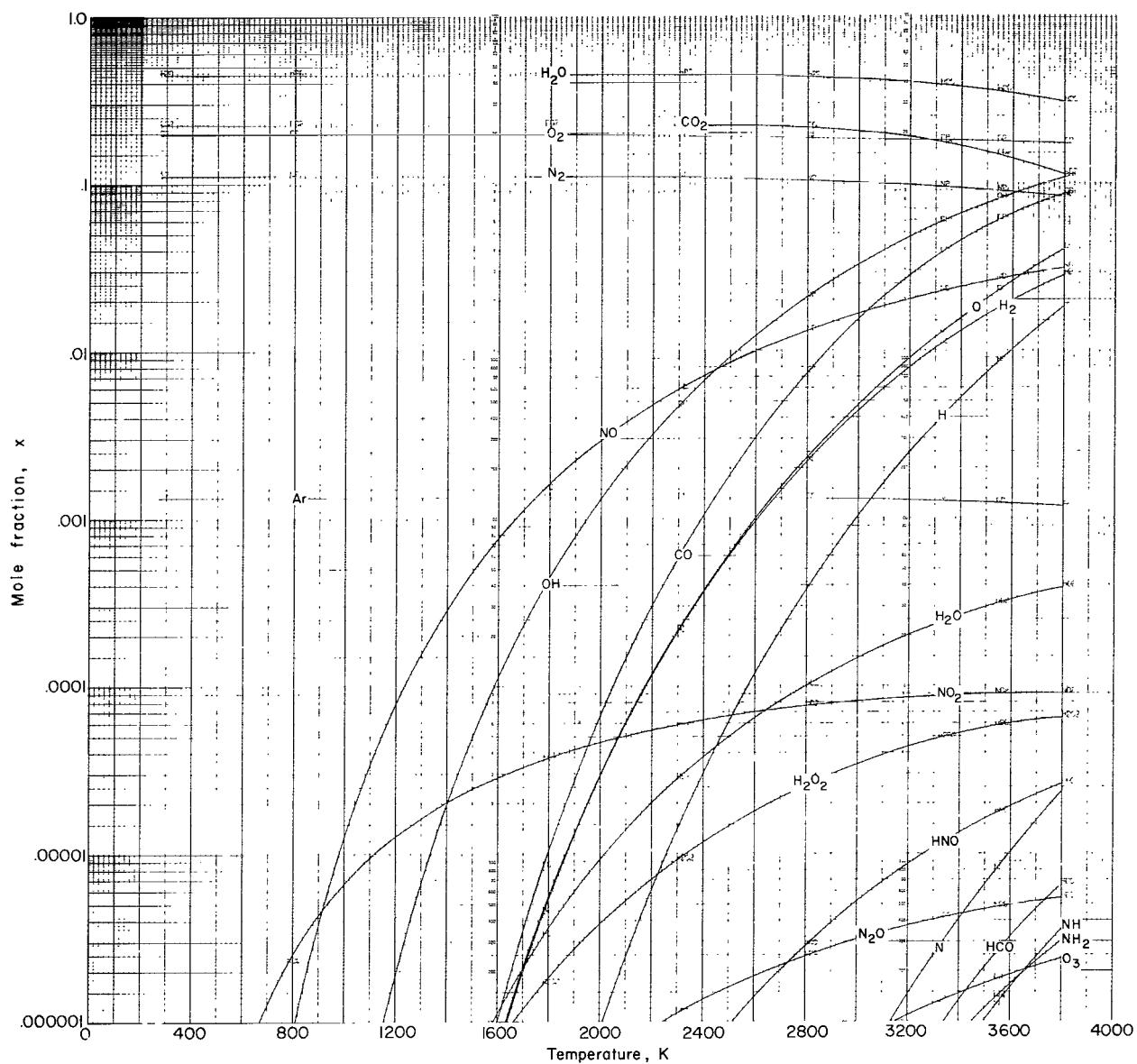
(d) Variation of composition with temperature at p = 100 atm.
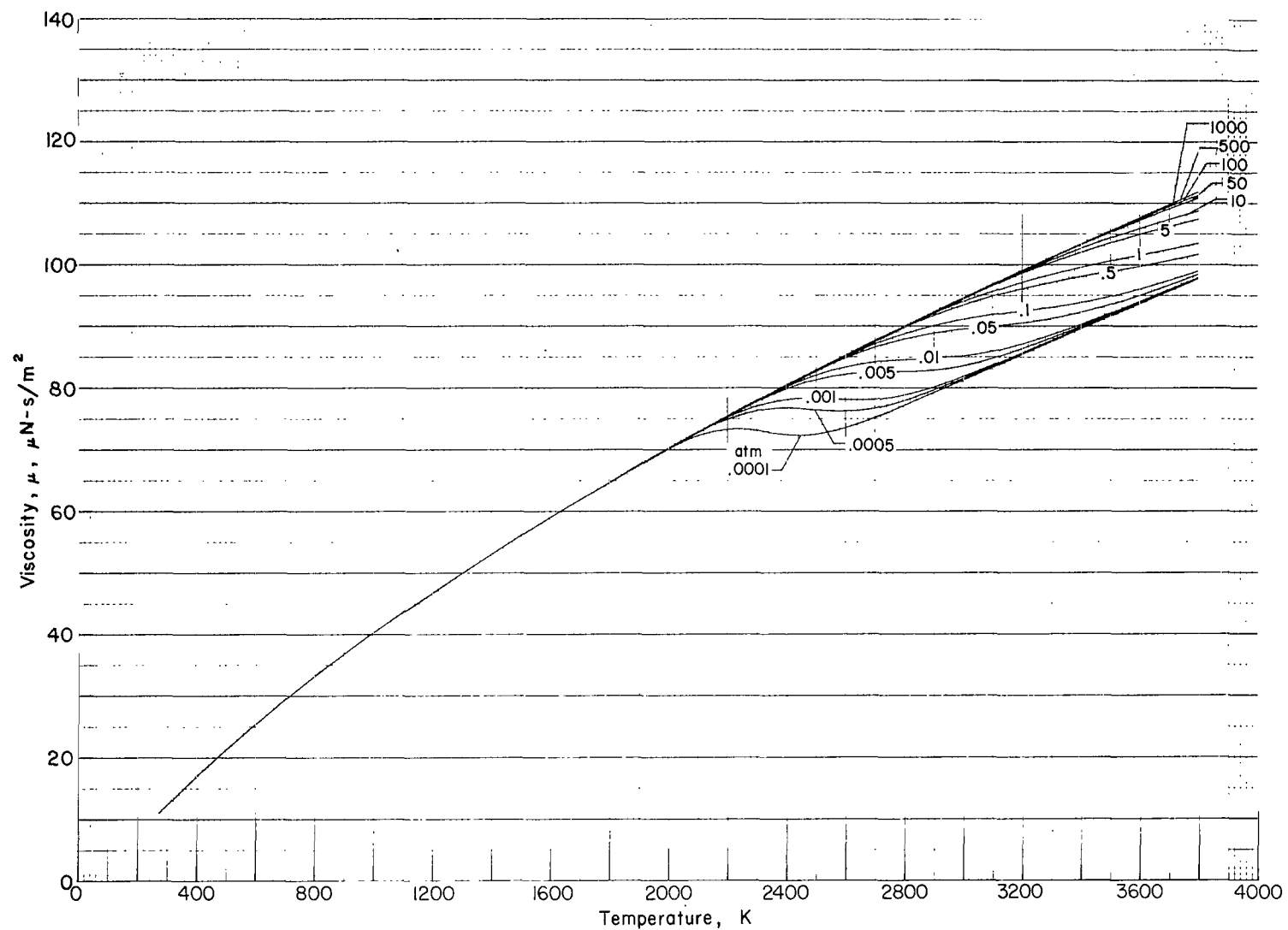
Figure 5.- Continued.
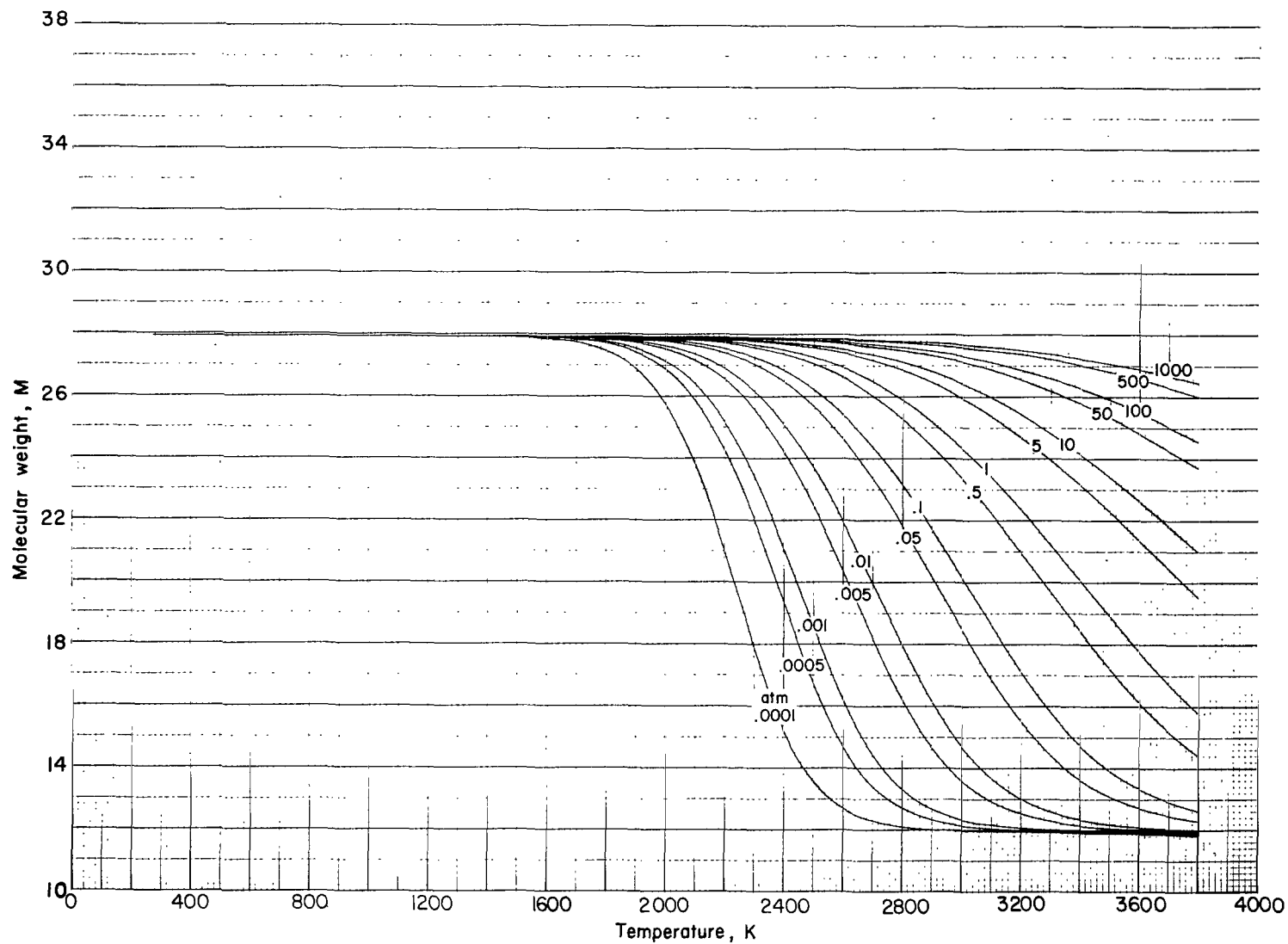
(e) Molecular weight as a function of temperature for various pressures.
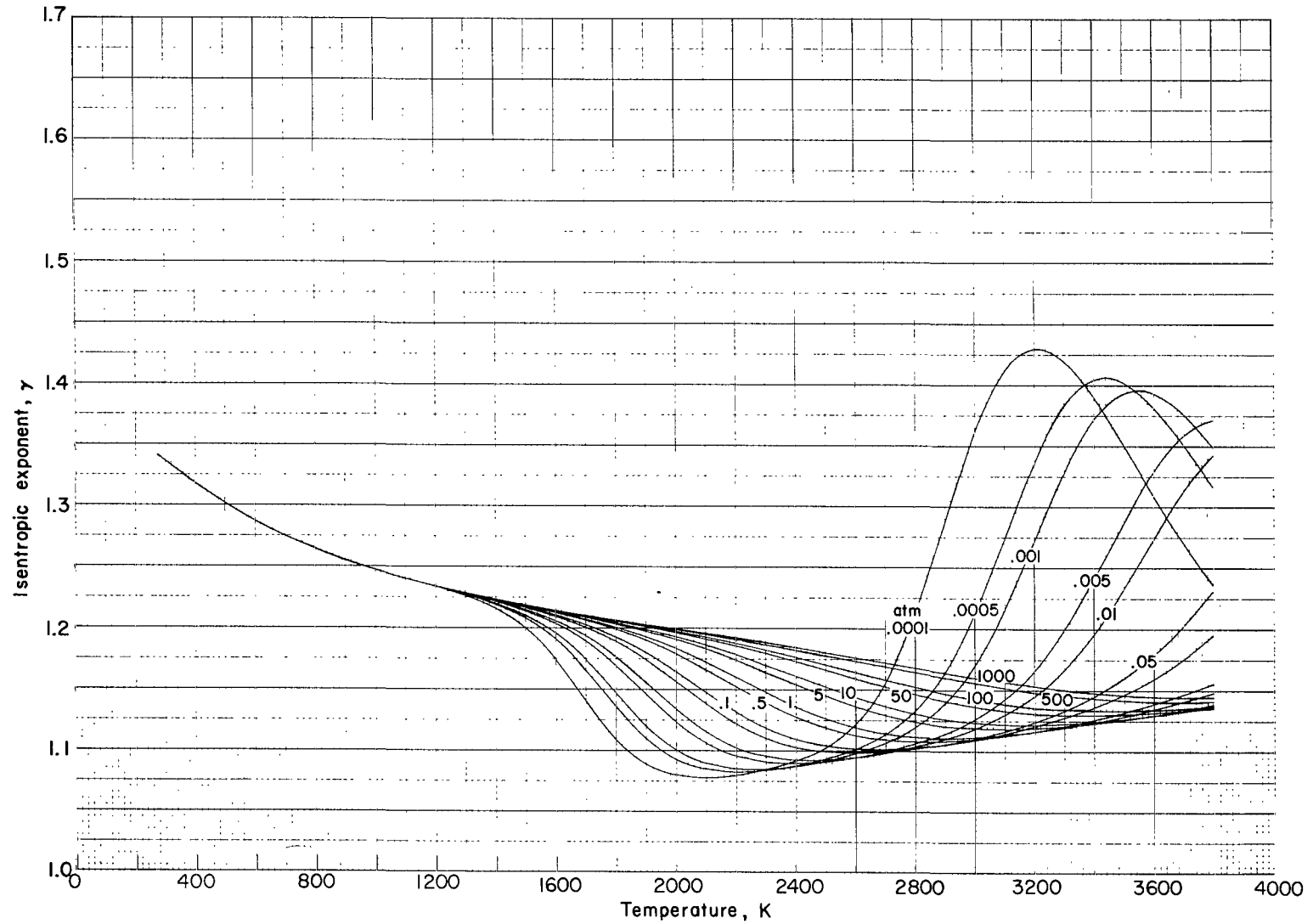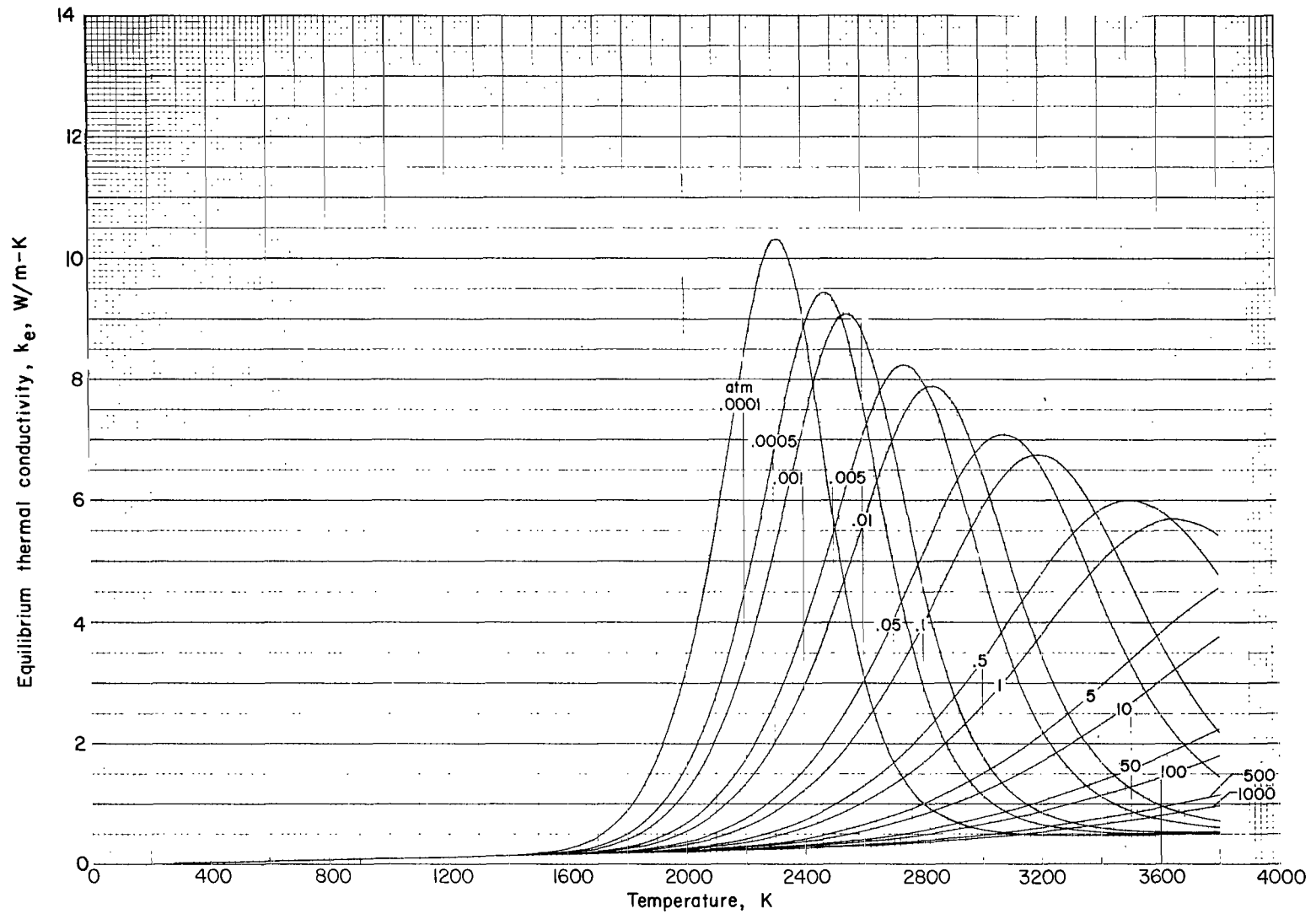
Figure 5.- Continued.

(f) Isentropic exponent as a function of temperature for various pressures.
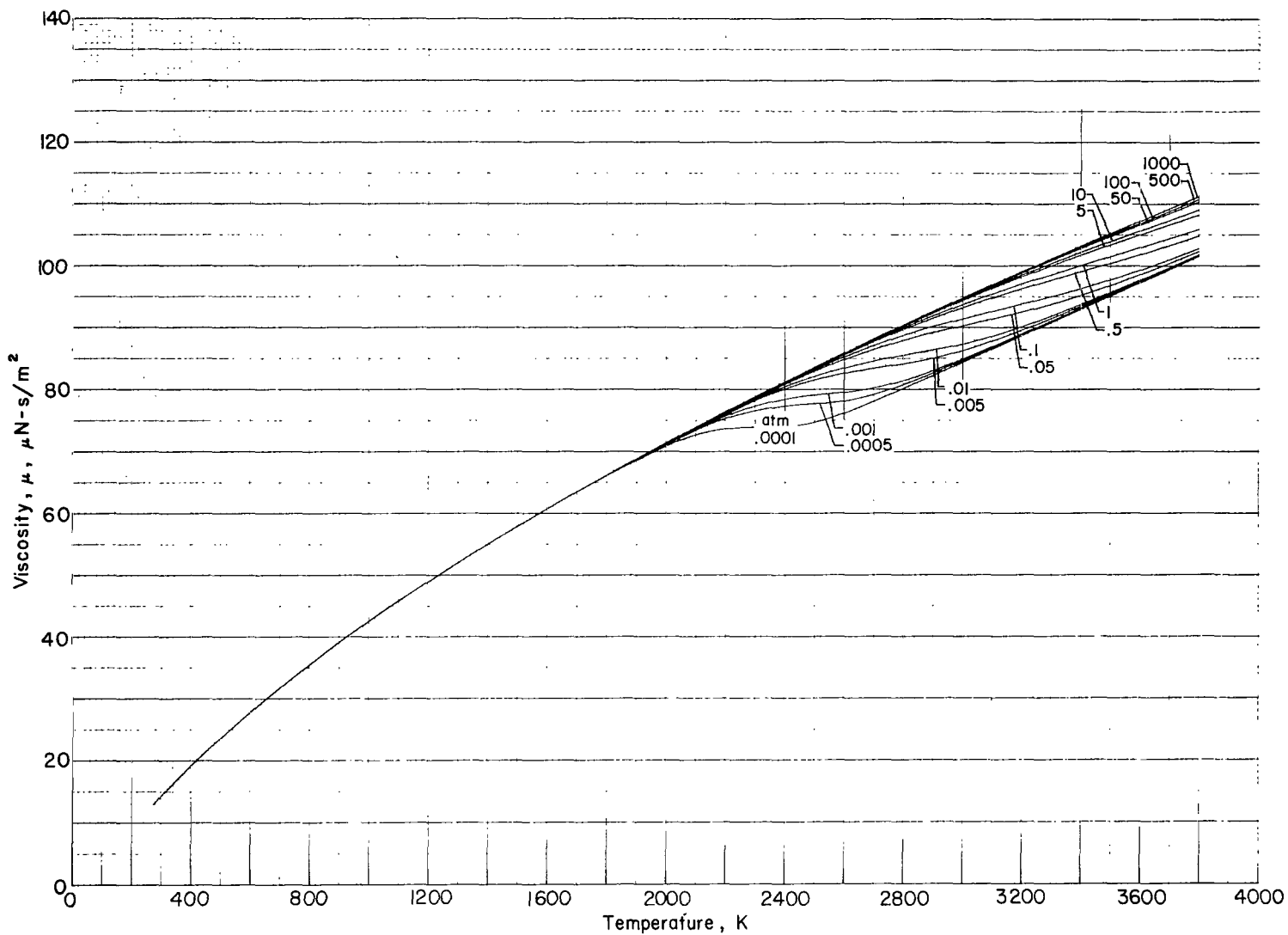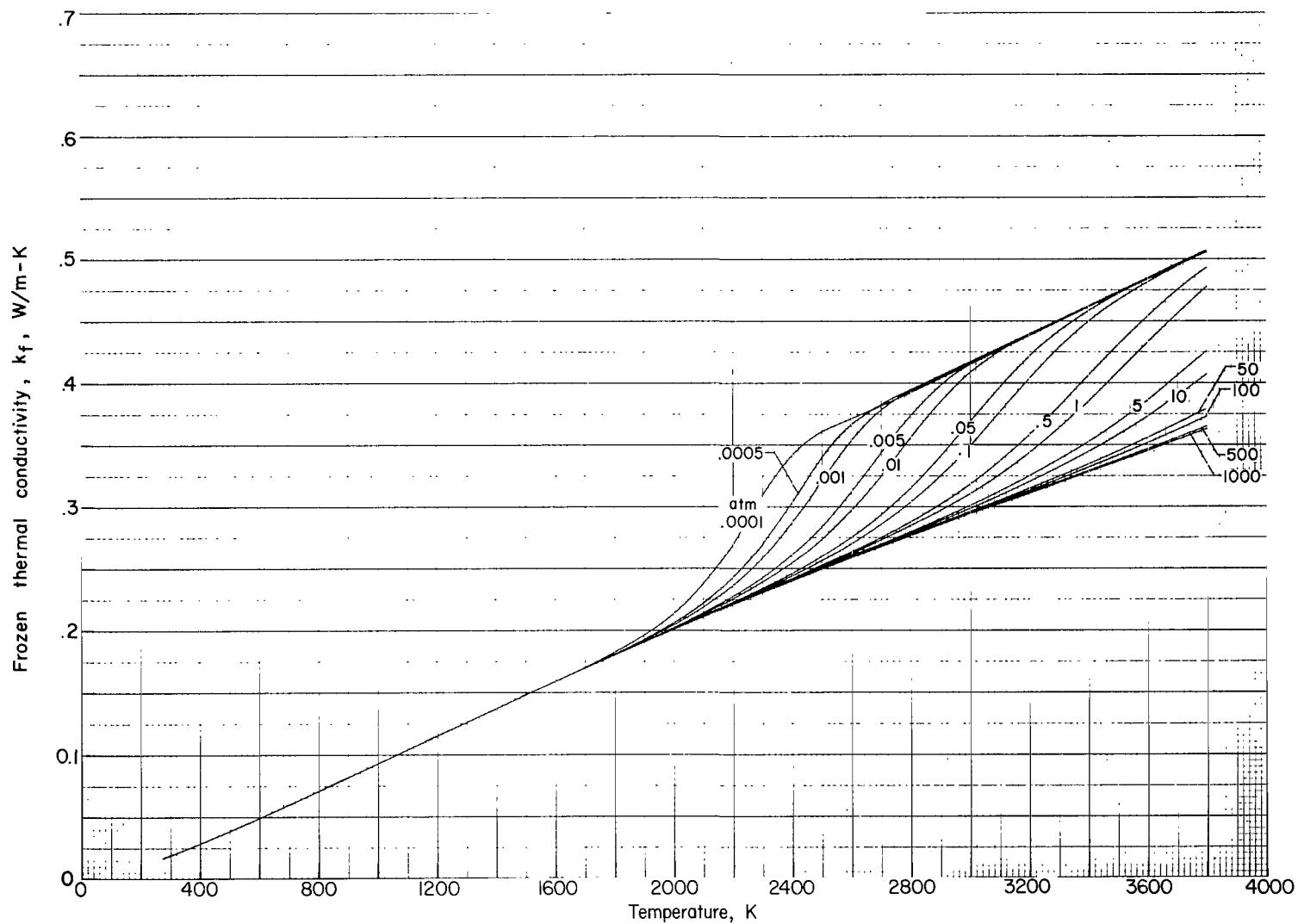
Figure 5.- Continued.

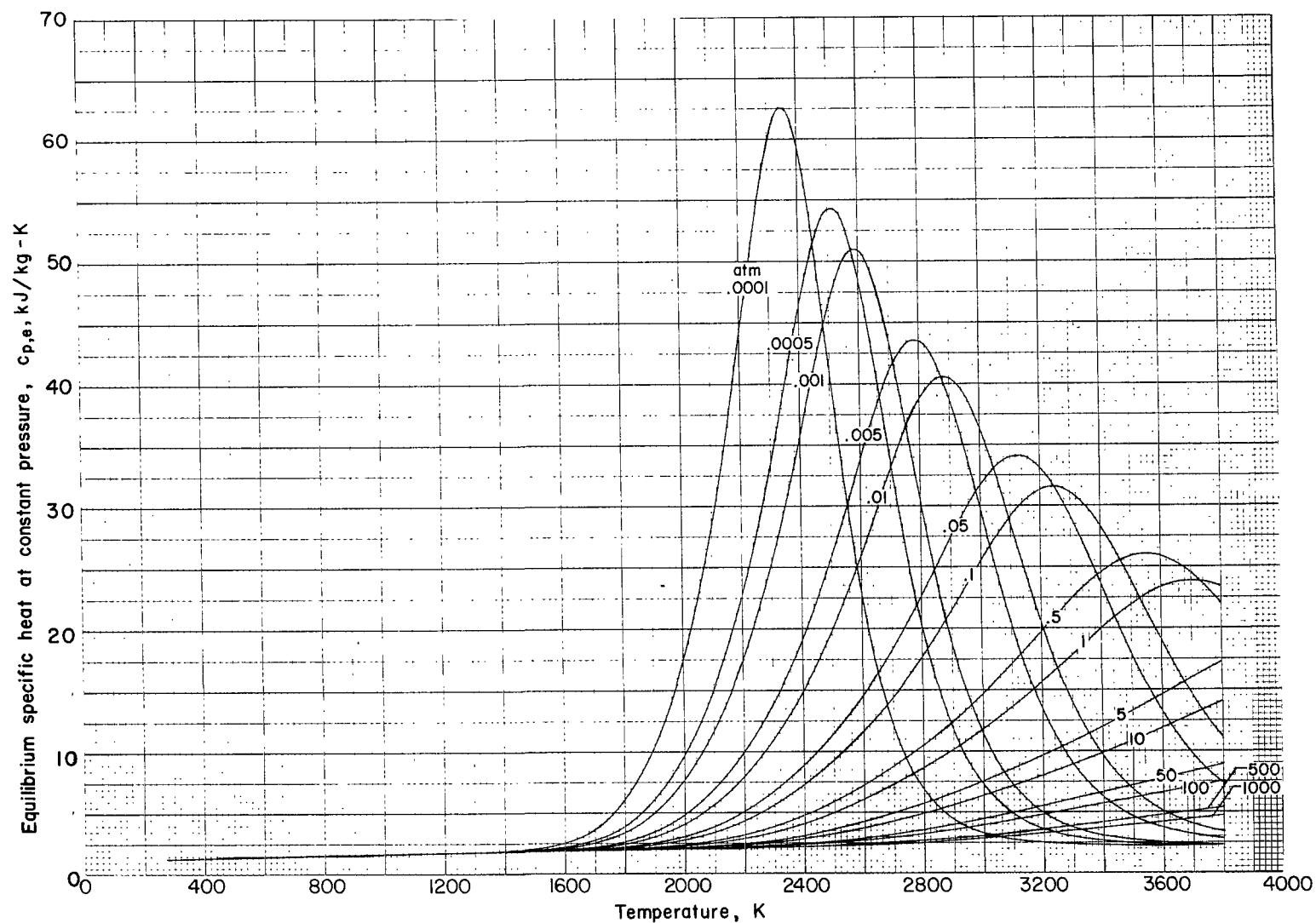(g) Viscosity as a function of temperature for various pressures.
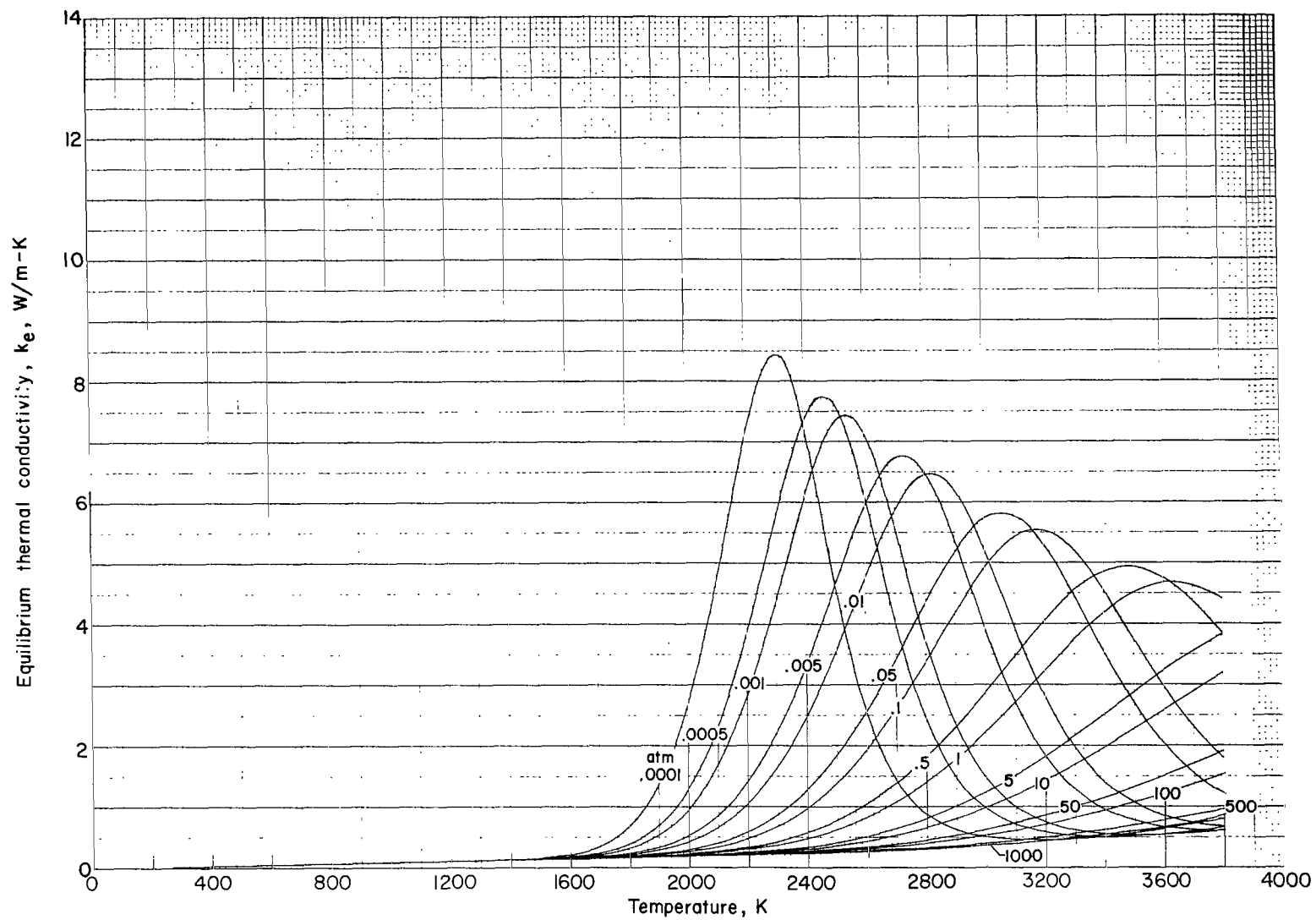
Figure 5.- Continued.

(h) Equilibrium thermal conductivity as a function of temperature for various pressures.
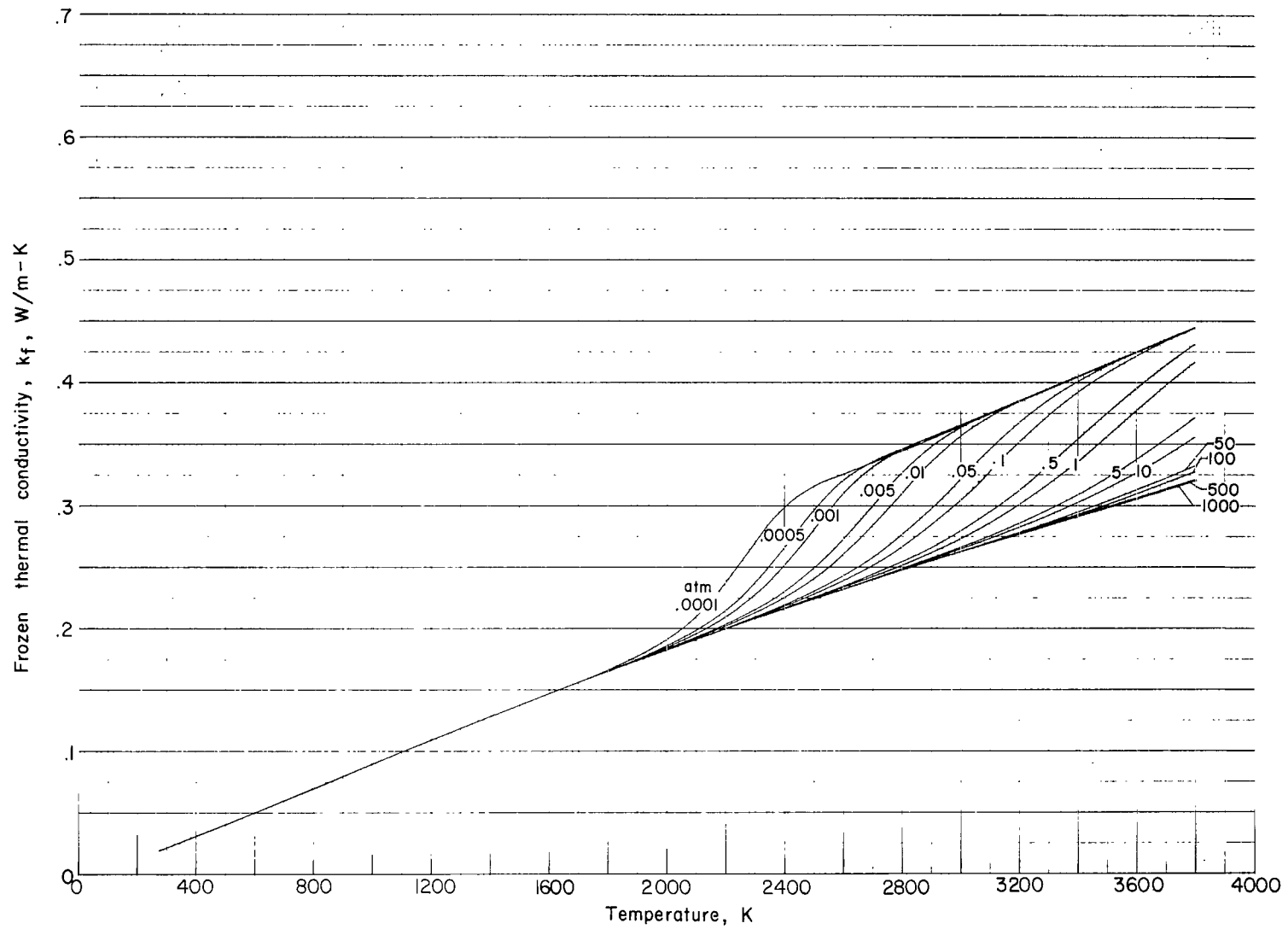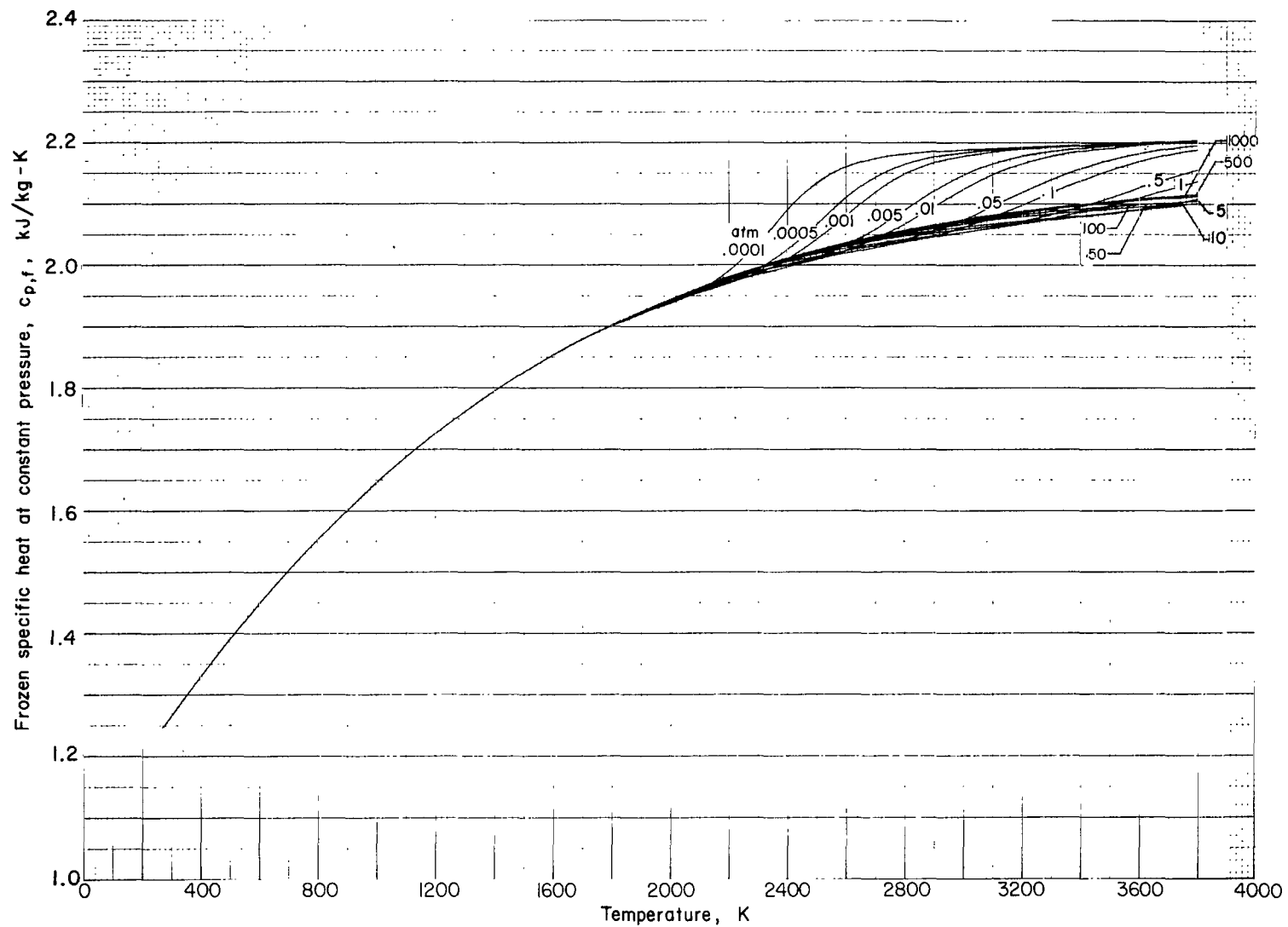
Figure 5.- Continued.

(i) Frozen thermal conductivity as a function of temperature for various pressures.
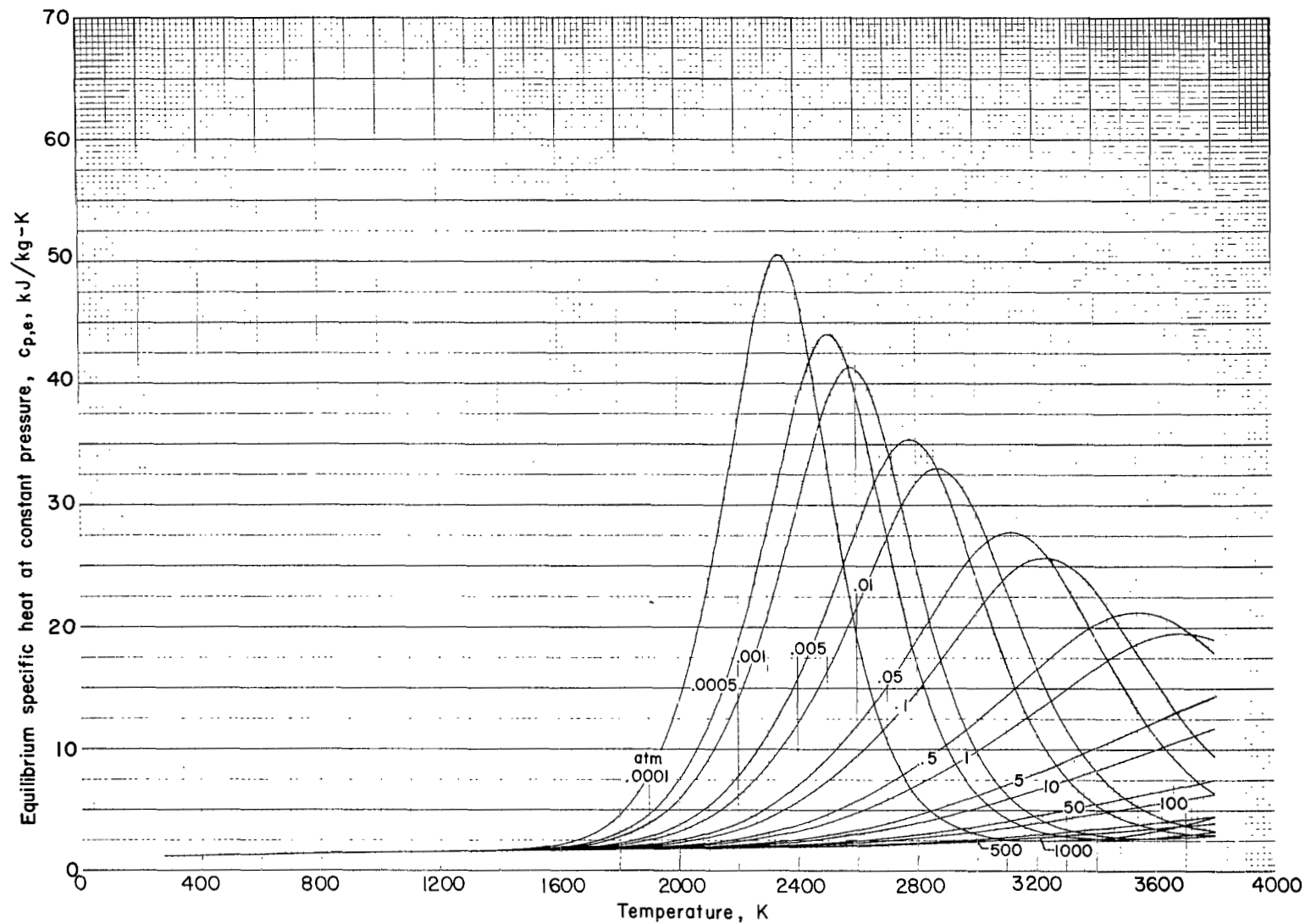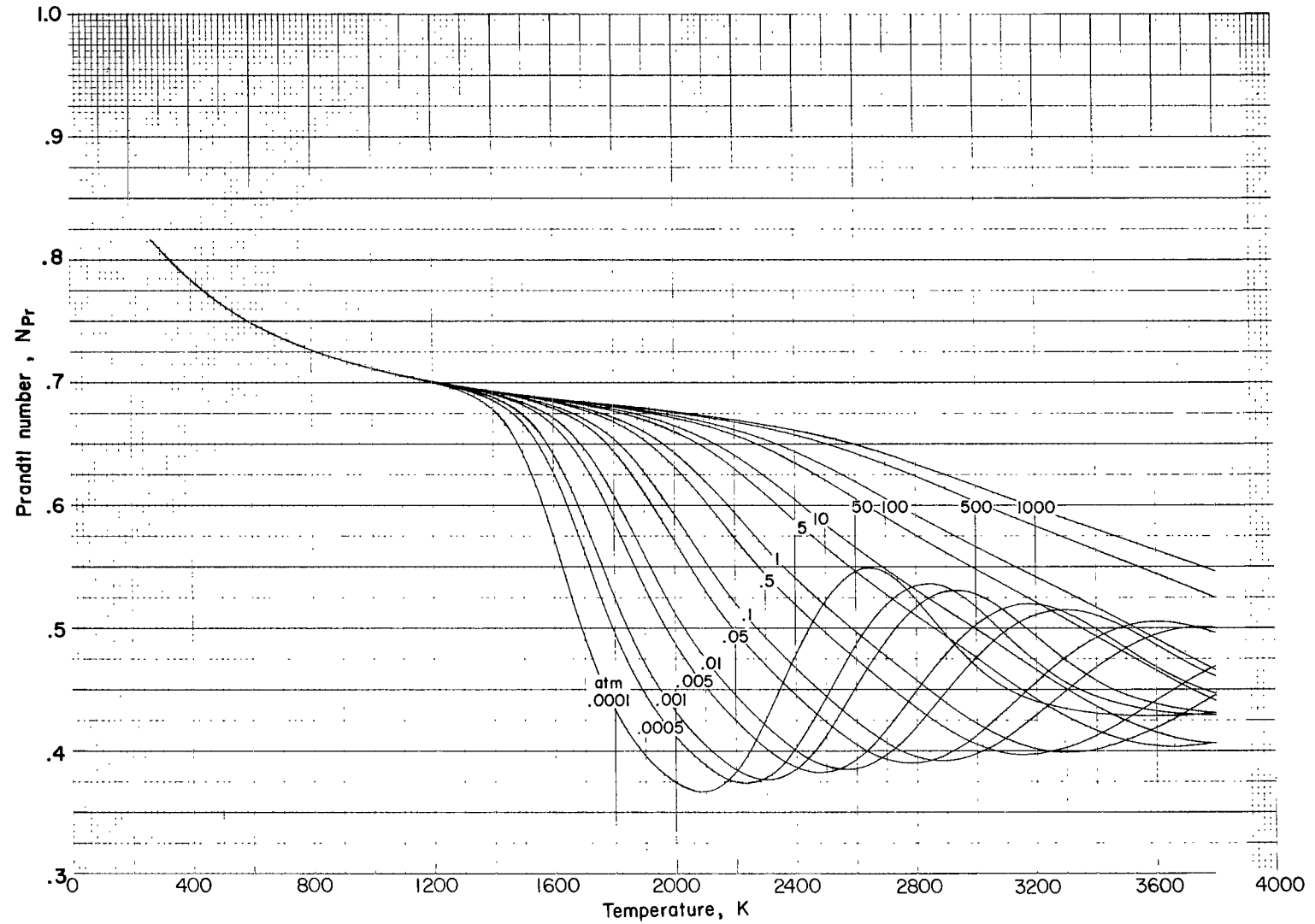
Figure 5.- Continued.

(j) Equilibrium specific heat as a function of temperature for various pressures.
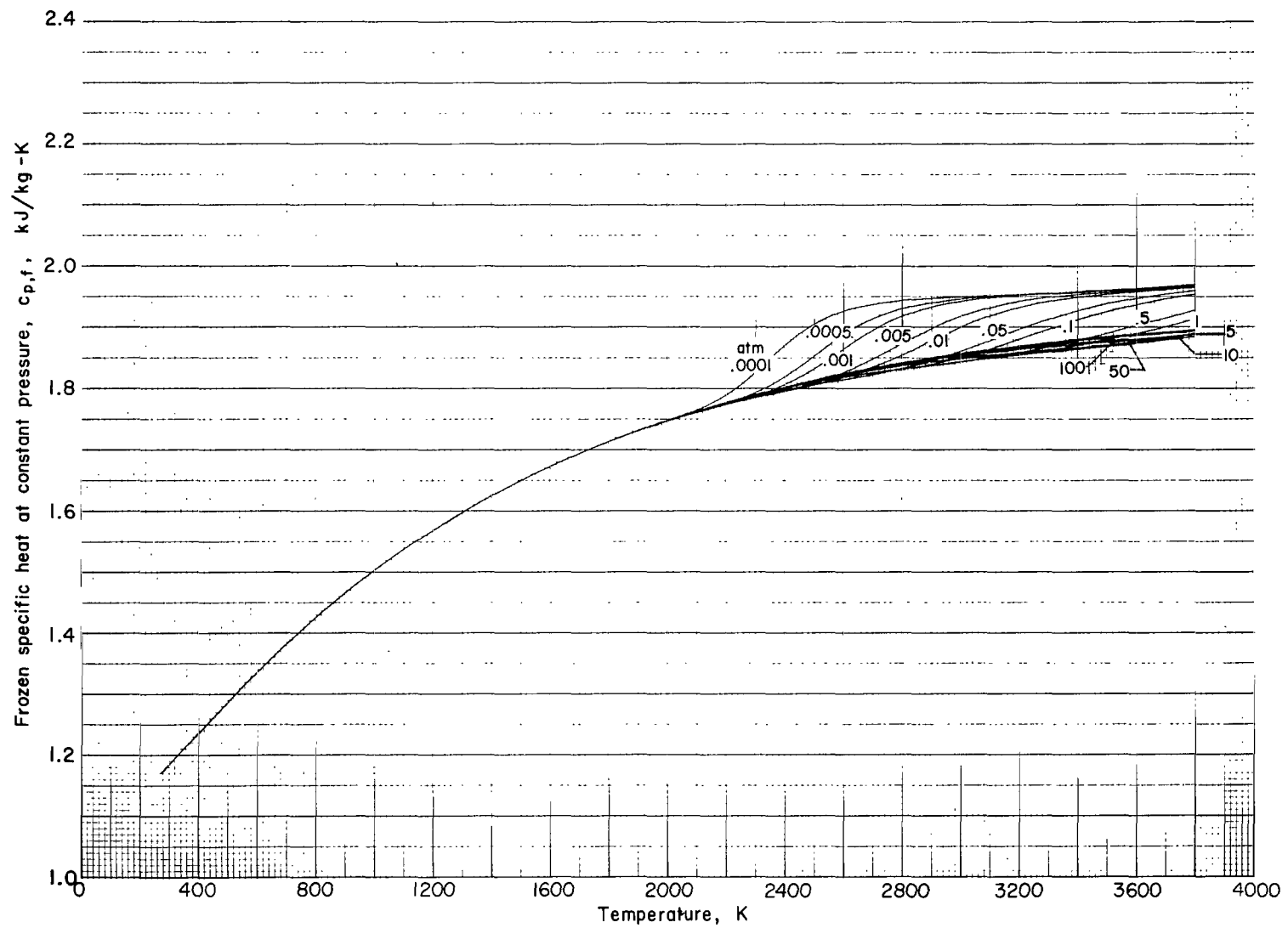
Figure 5.- Continued.

(k) Frozen specific heat as a function of temperature for various pressures.

Figure 5.- Continued.
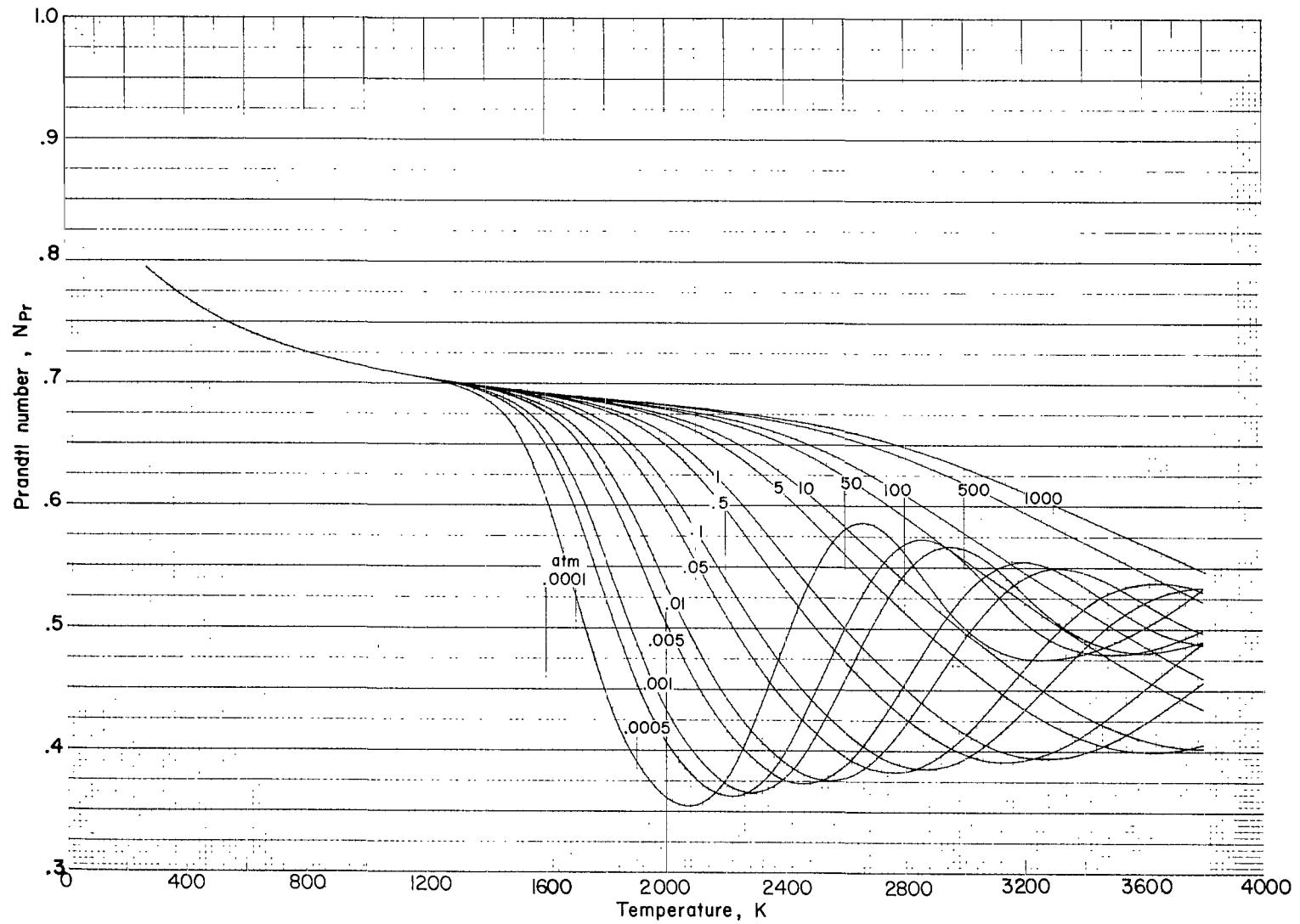
(l) Prandtl number as a function of temperature for various pressures.

Figure 5.- Concluded.
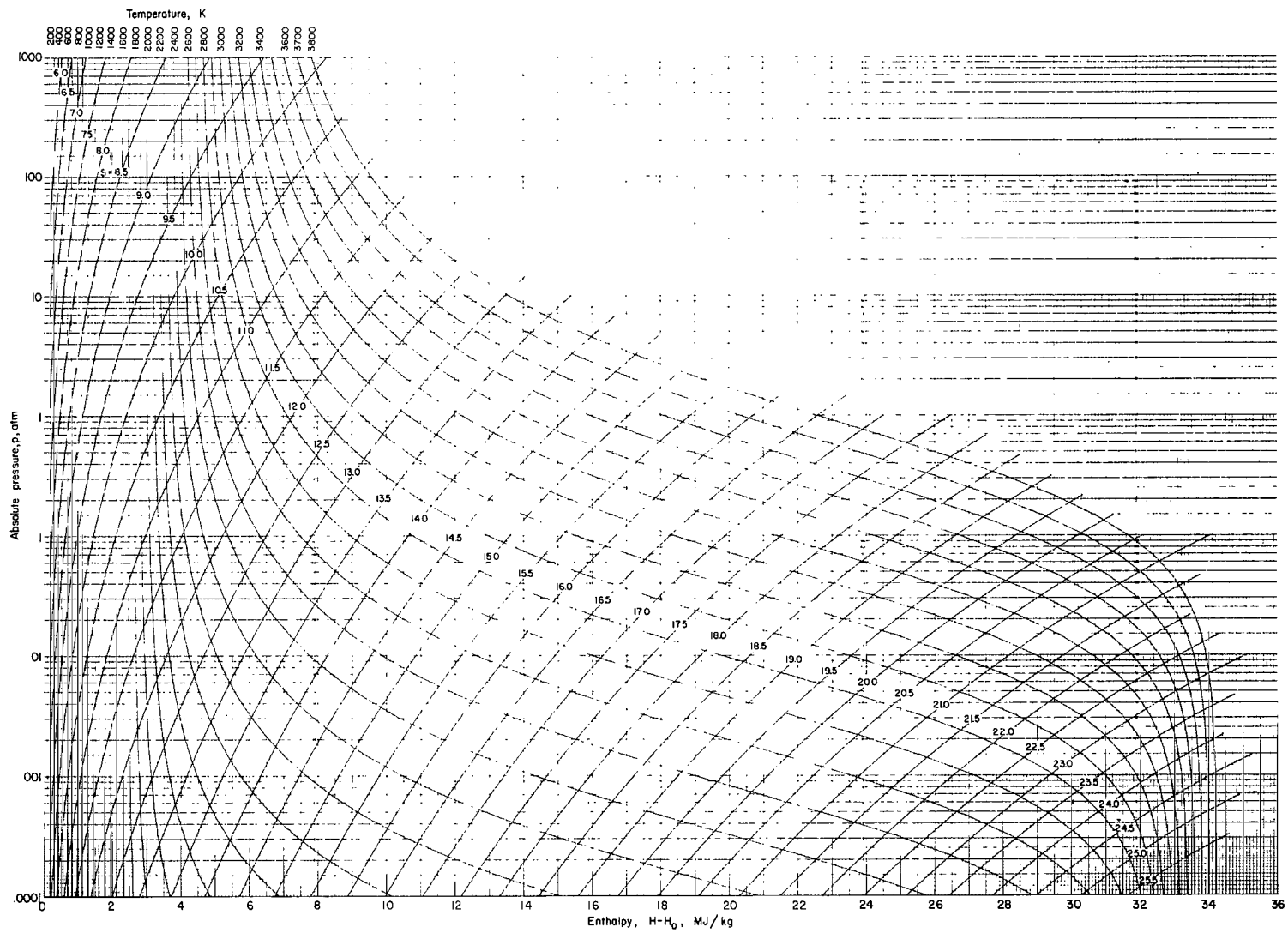
(a) Pressure-enthalpy diagram with lines of constant temperature and entropy.

Figure 6.- Thermodynamic and transport properties of products from methane-oxygen combustion (mixture D).
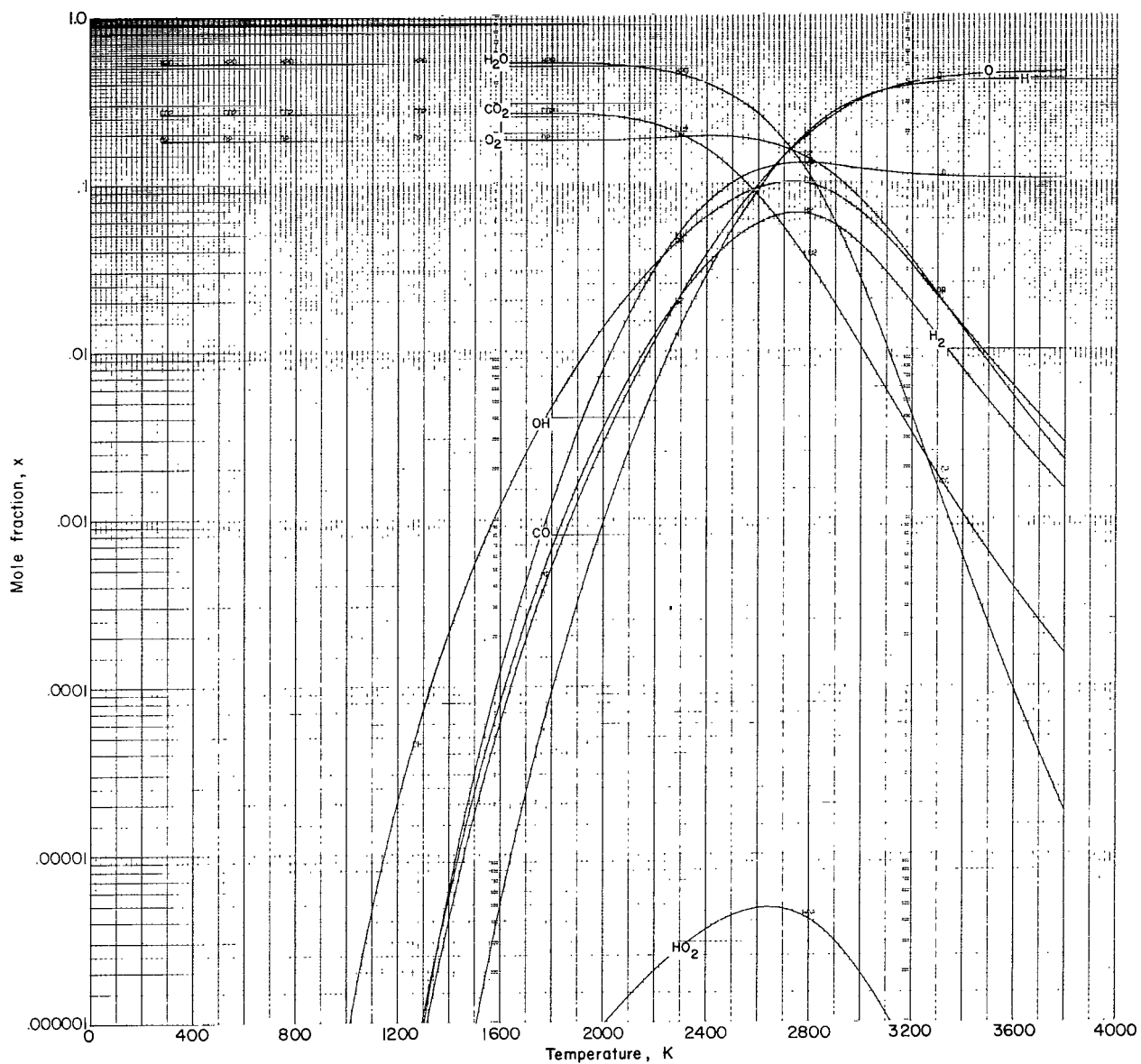
(b) Variation of composition with temperature at   p = 0.01 atm.

Figure 6.- Continued.
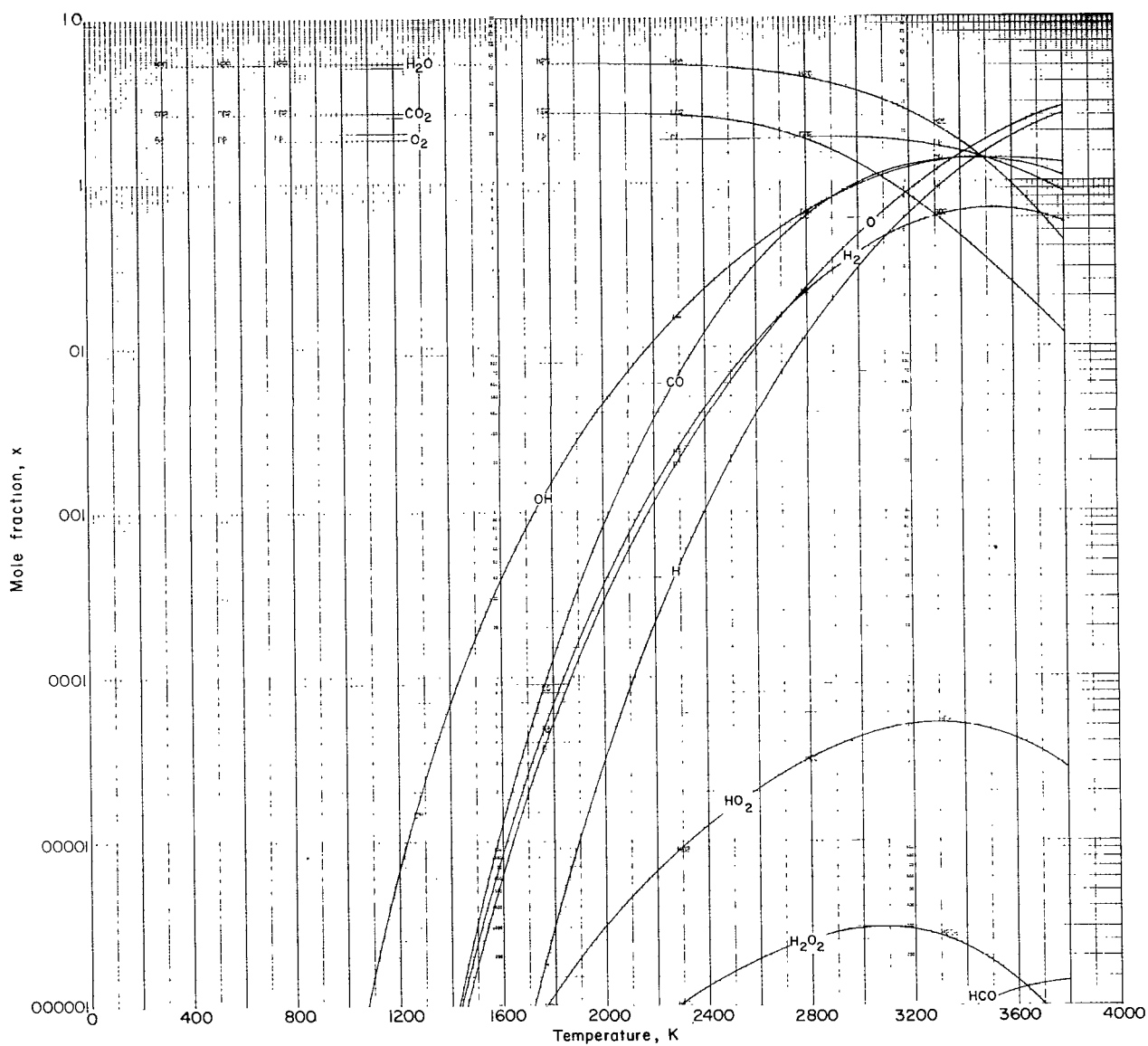
(c) Variation of composition with temperature at p = 1.0 atm.

Figure 6.- Continued.
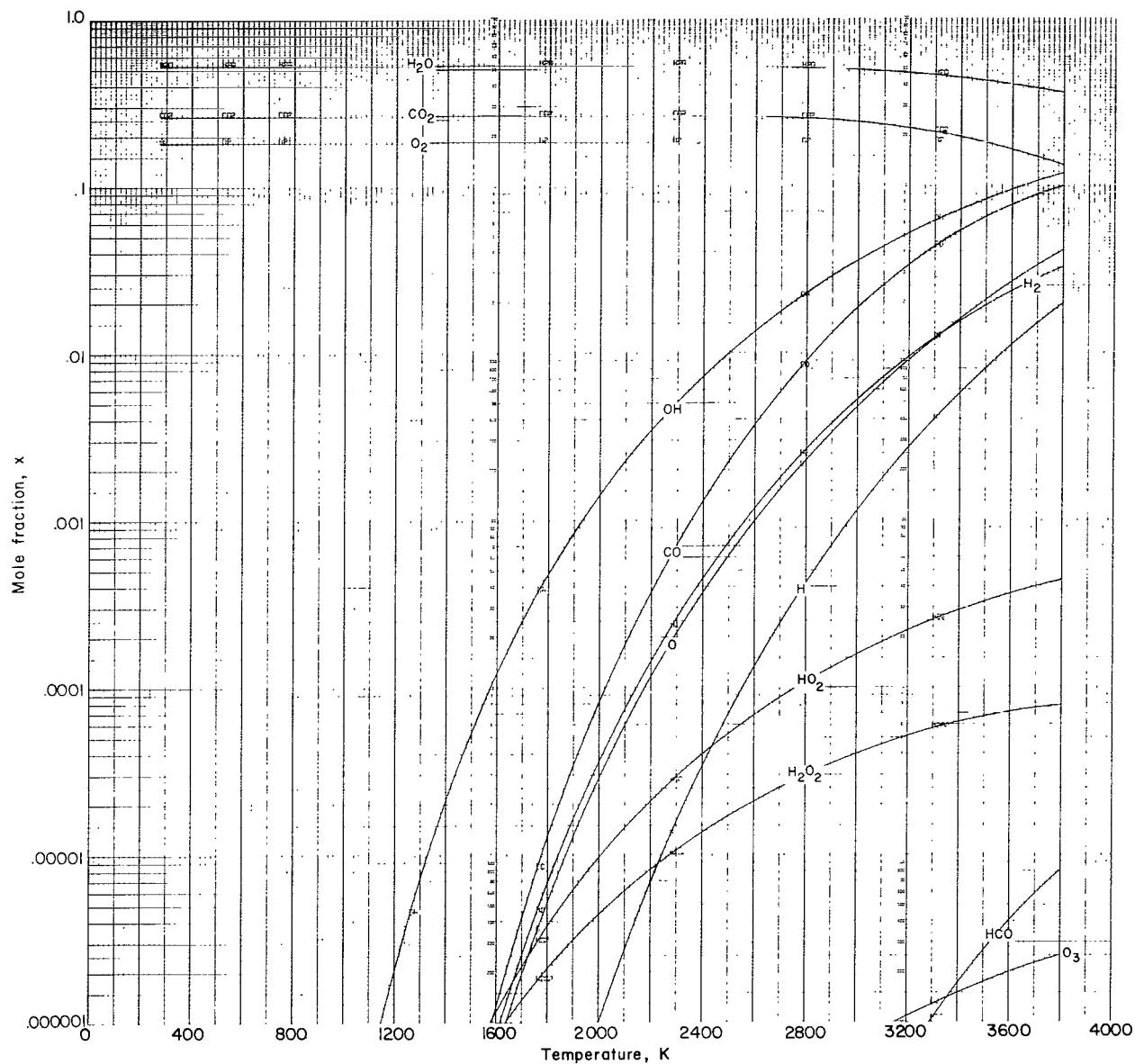
(d) Variation of composition with temperature at $p = 100$ atm.

Figure 6.- Continued.
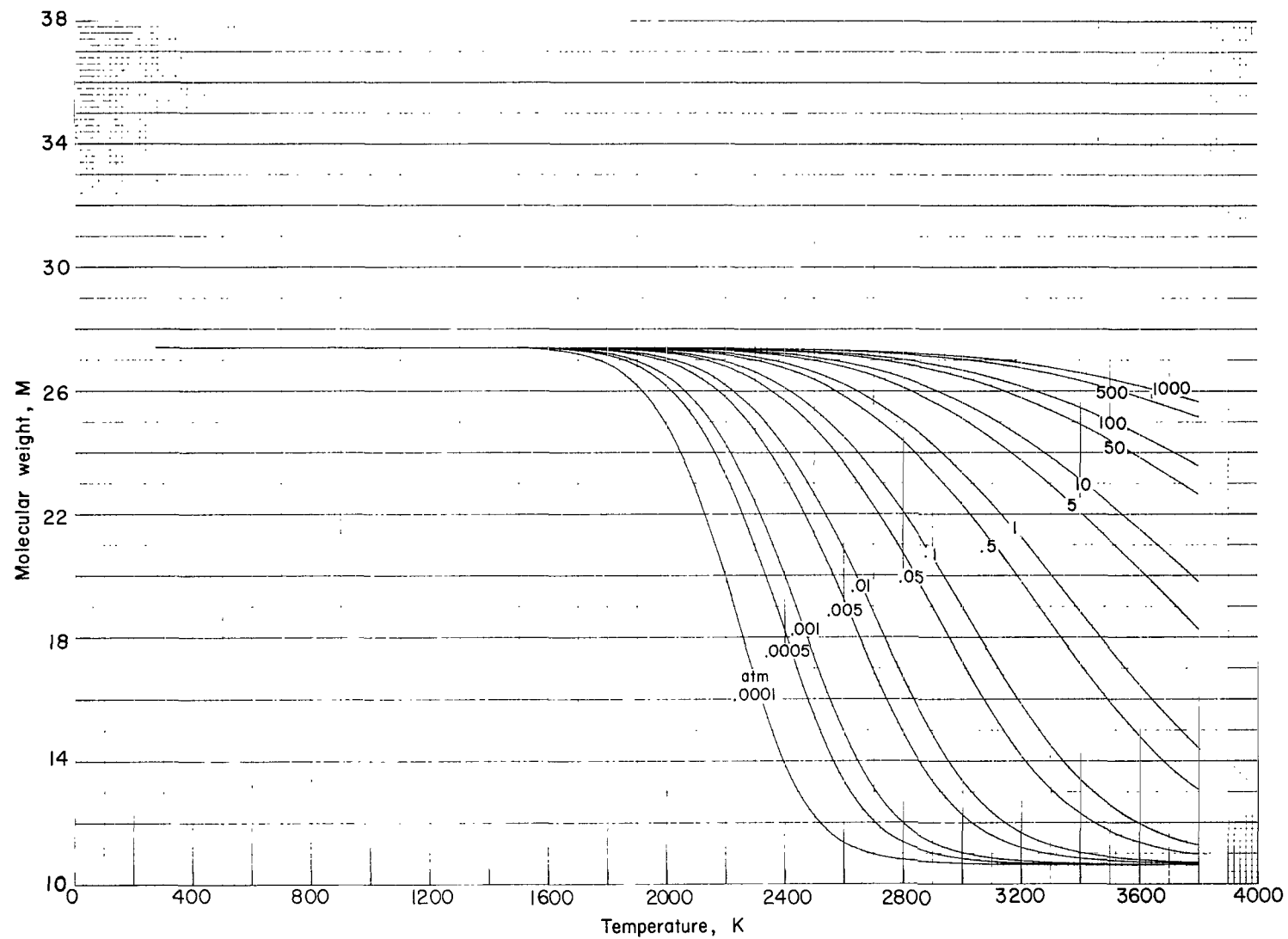
(e) Molecular weight as a function of temperature for various pressures.
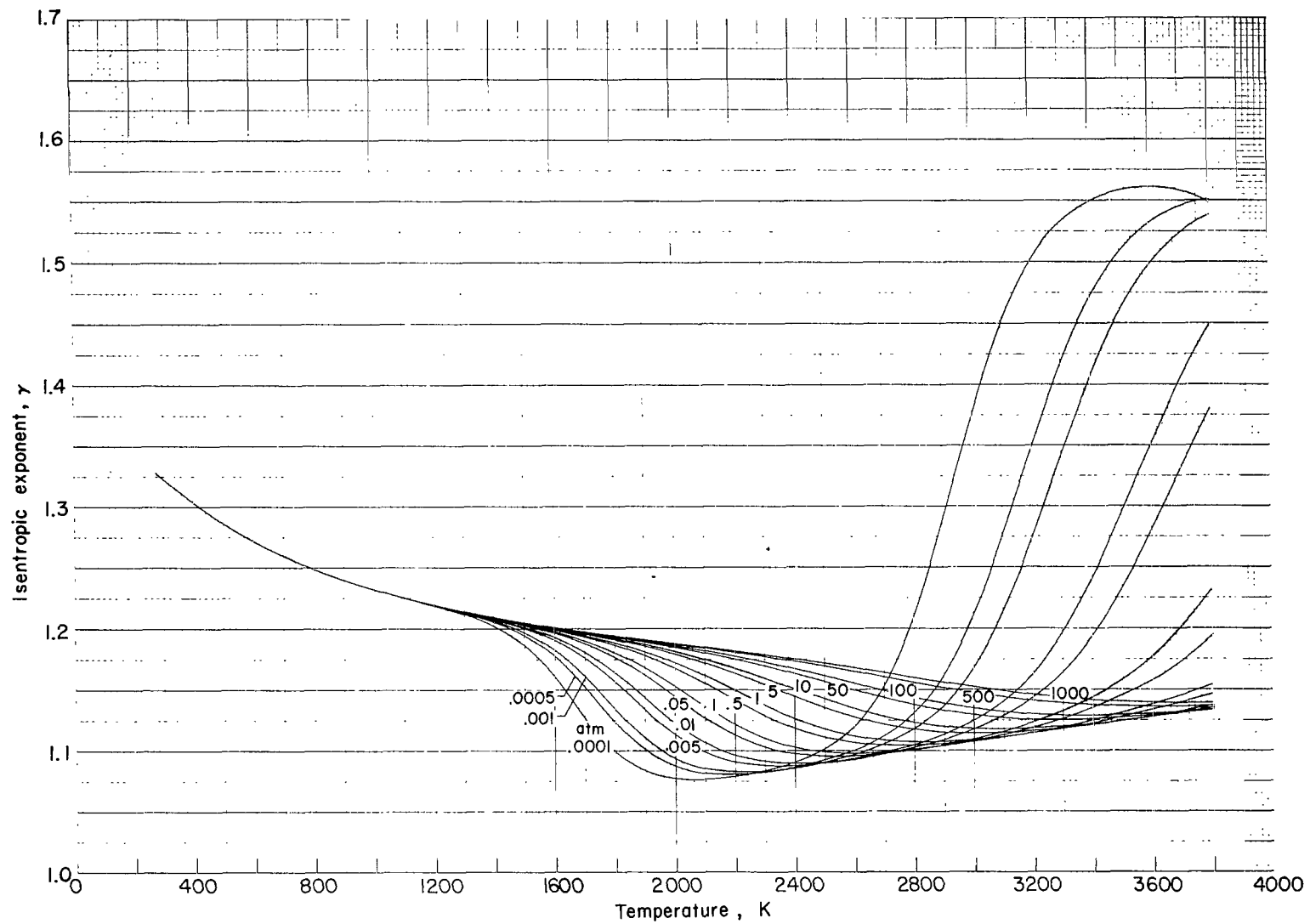
Figure 6.- Continued.

(f) Isentropic exponent as a function of temperature for various pressures.
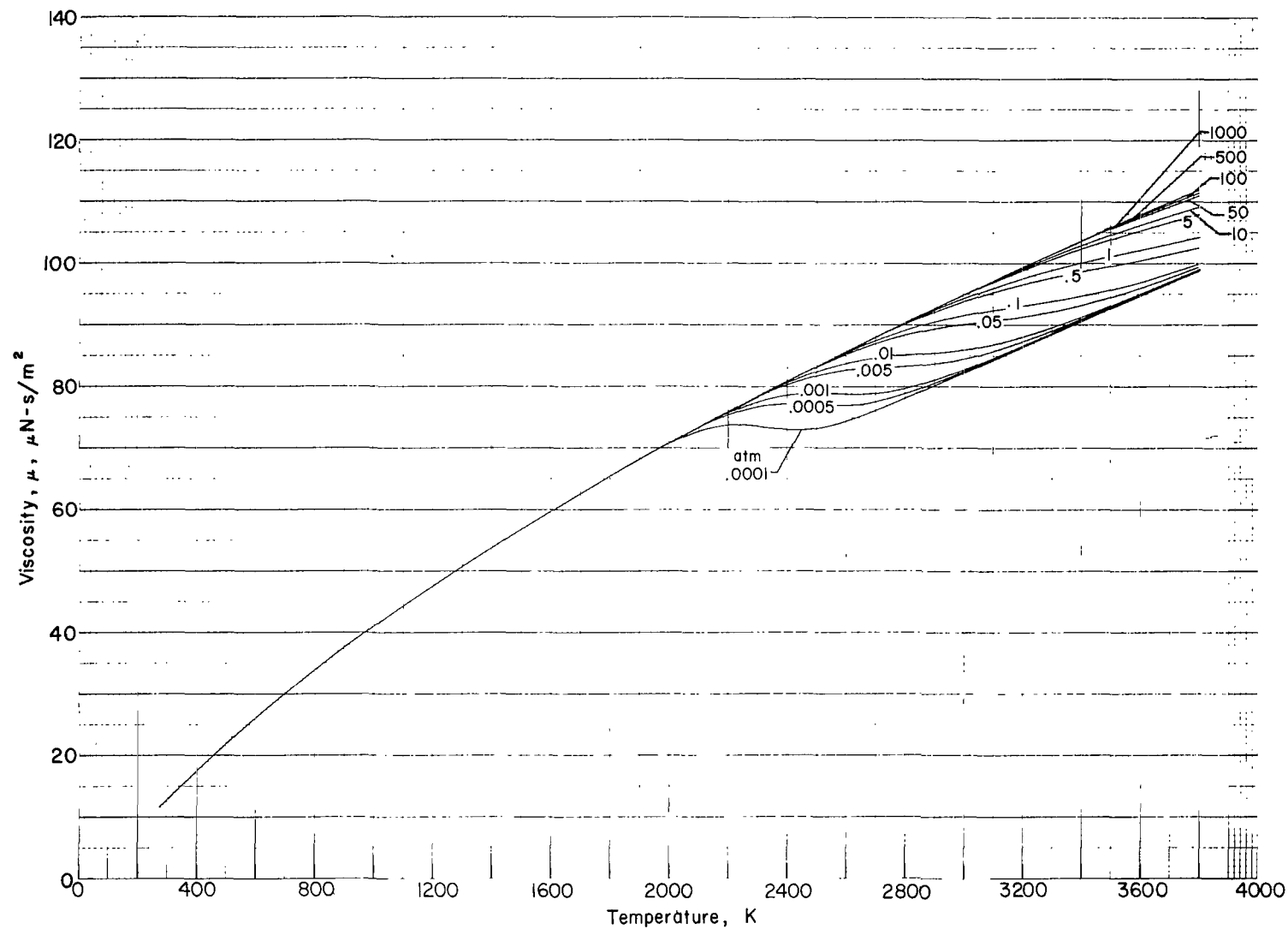
Figure 6.- Continued.

(g) Viscosity as a function of temperature for various pressures.
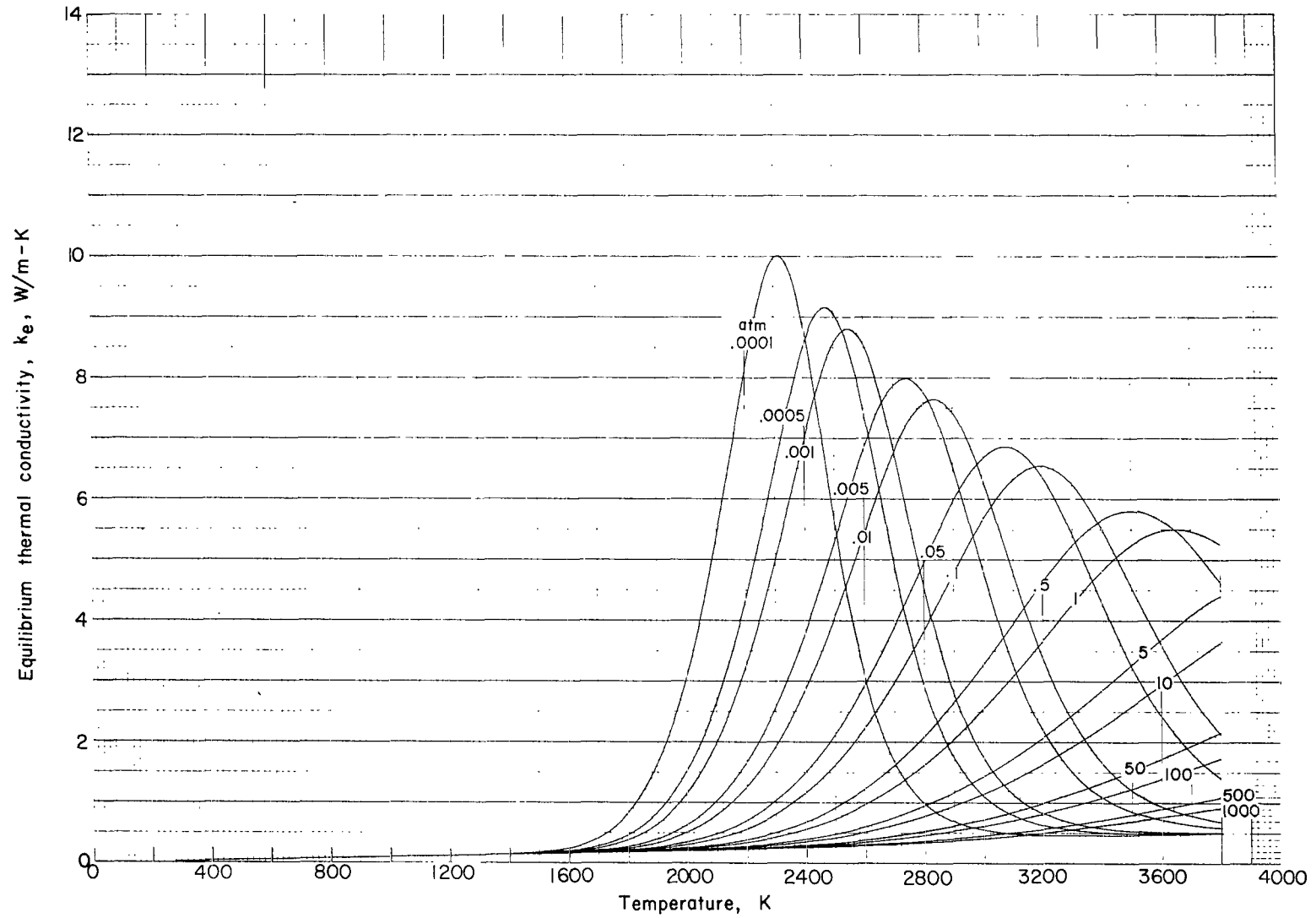
Figure 6.- Continued.

(h) Equilibrium thermal conductivity as a function of temperature for various pressures.
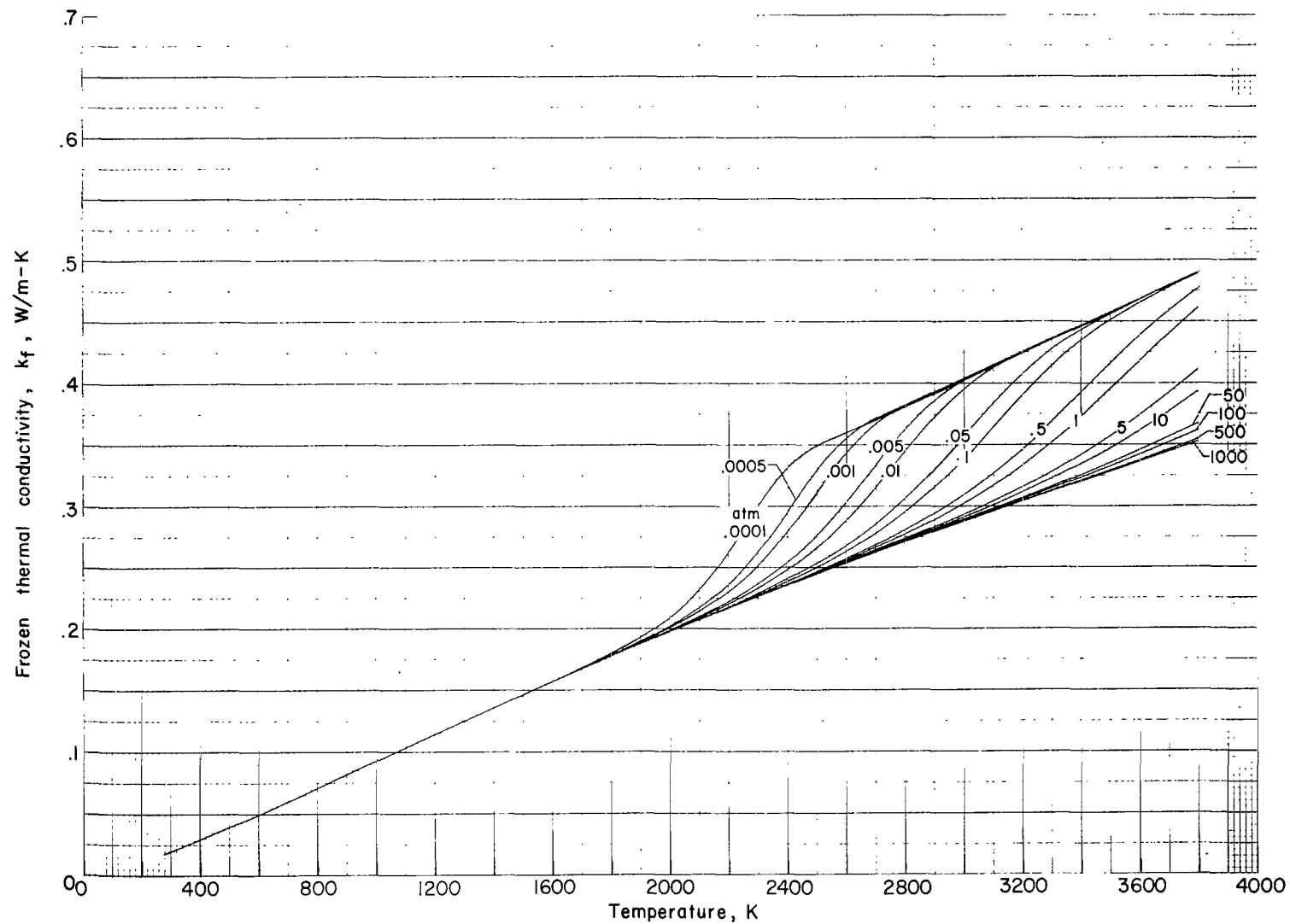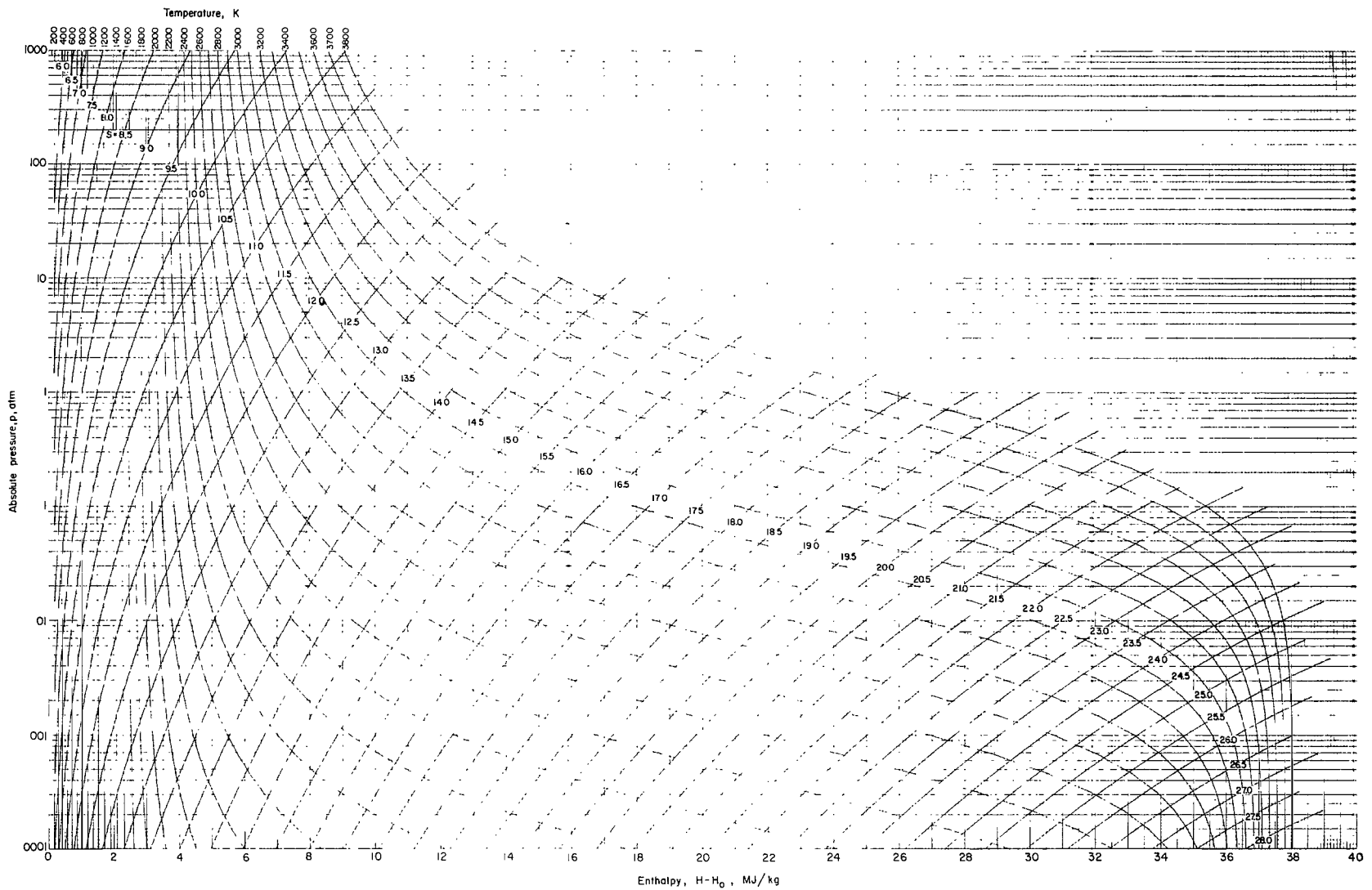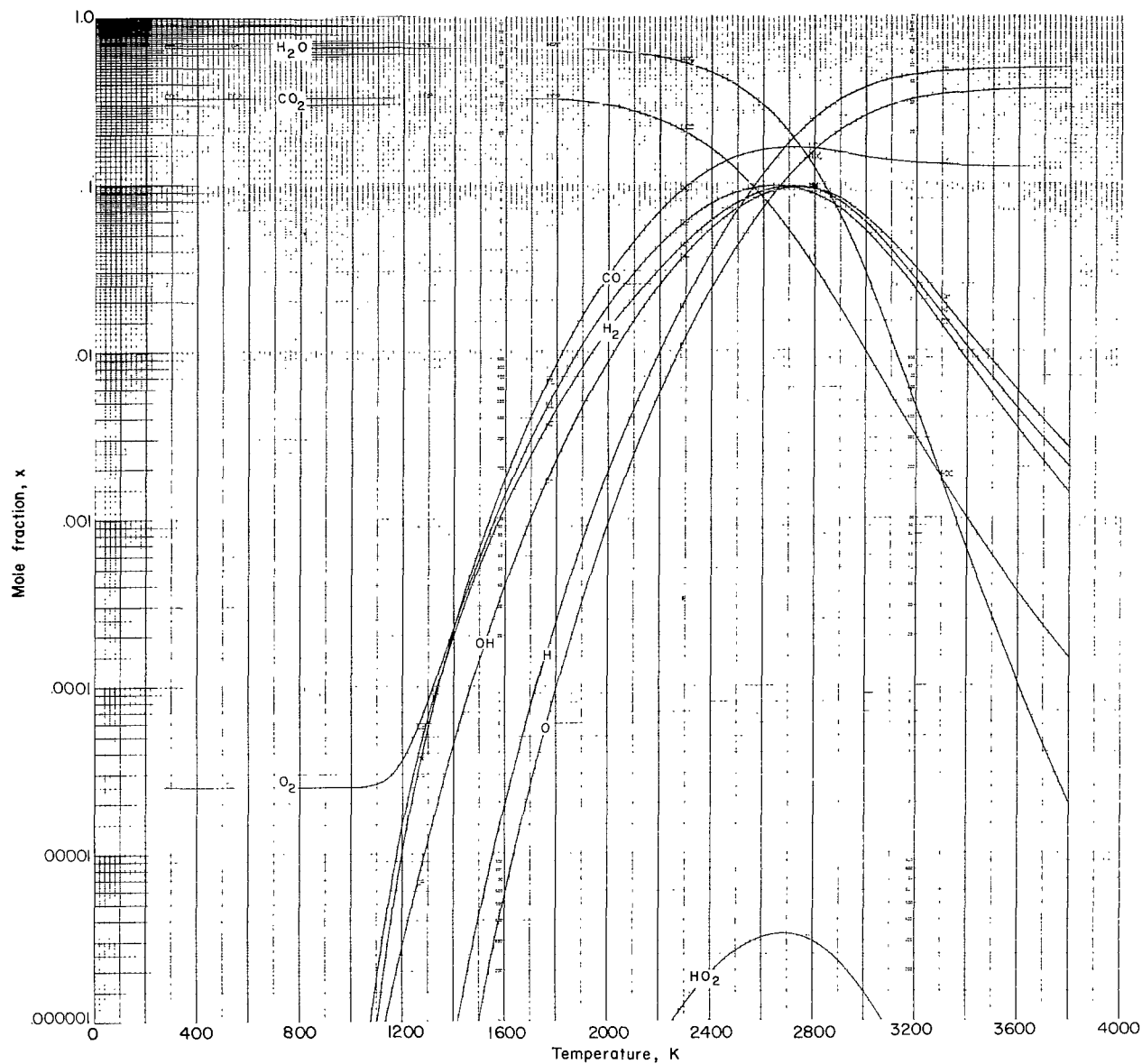
Figure 6.- Continued.

(i) Frozen thermal conductivity as a function of temperature for various pressures.

Figure 6.- Continued.

(j) Equilibrium specific heat as a function of temperature for various pressures.

Figure 6.- Continued.

(k) Frozen specific heat as a function of temperature for various pressures.

Figure 6.- Continued.

(1) Prandtl number as a function of temperature for various pressures.

Figure 6.- Concluded.

(a) Pressure-enthalpy diagram with lines of constant temperature and entropy.

Figure 7.- Thermodynamic and transport properties of products of methane-oxygen combustion (mixture E).
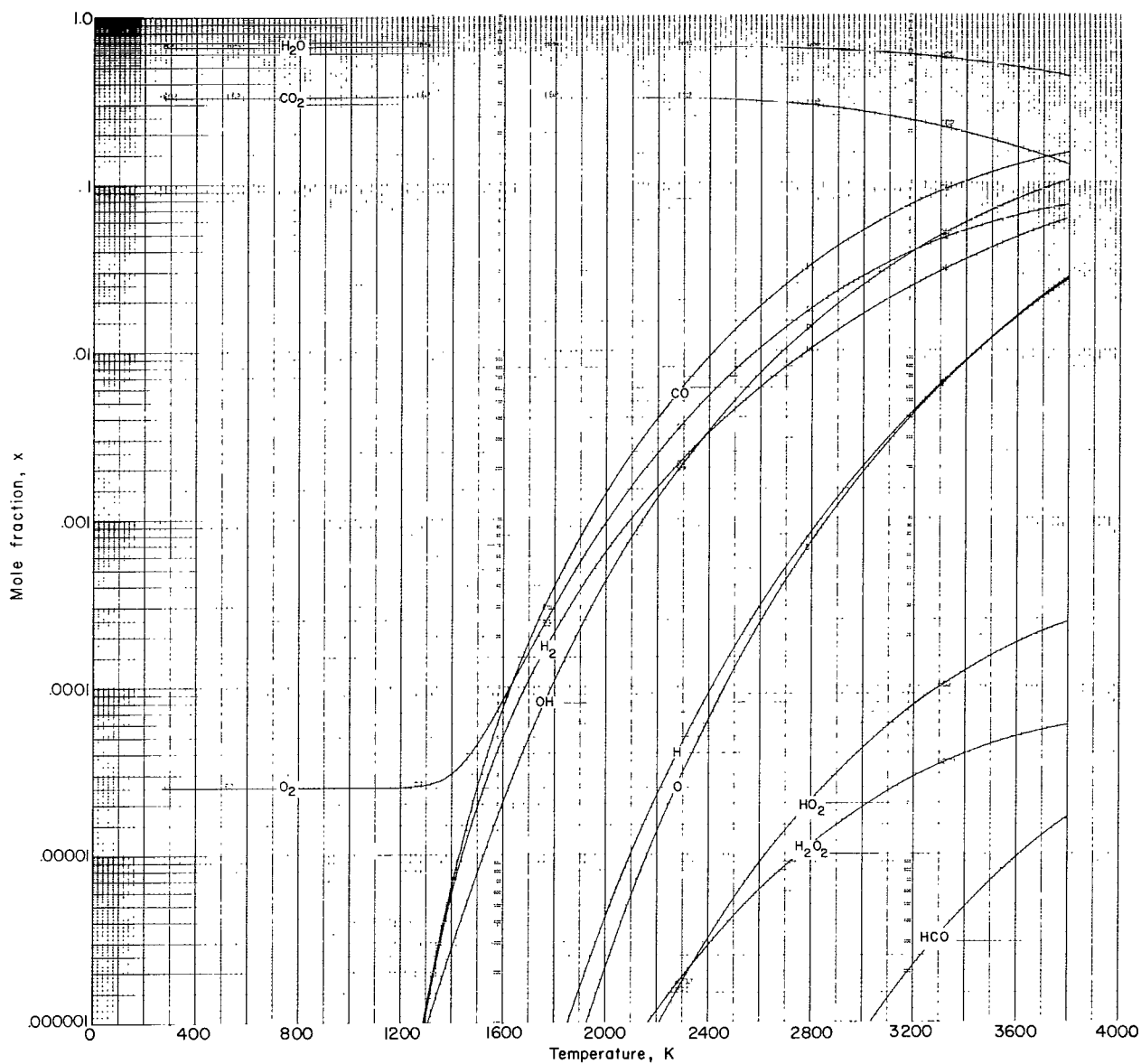
(b) Variation of composition with temperature at   p = 0.01 atm.

Figure 7.- Continued.
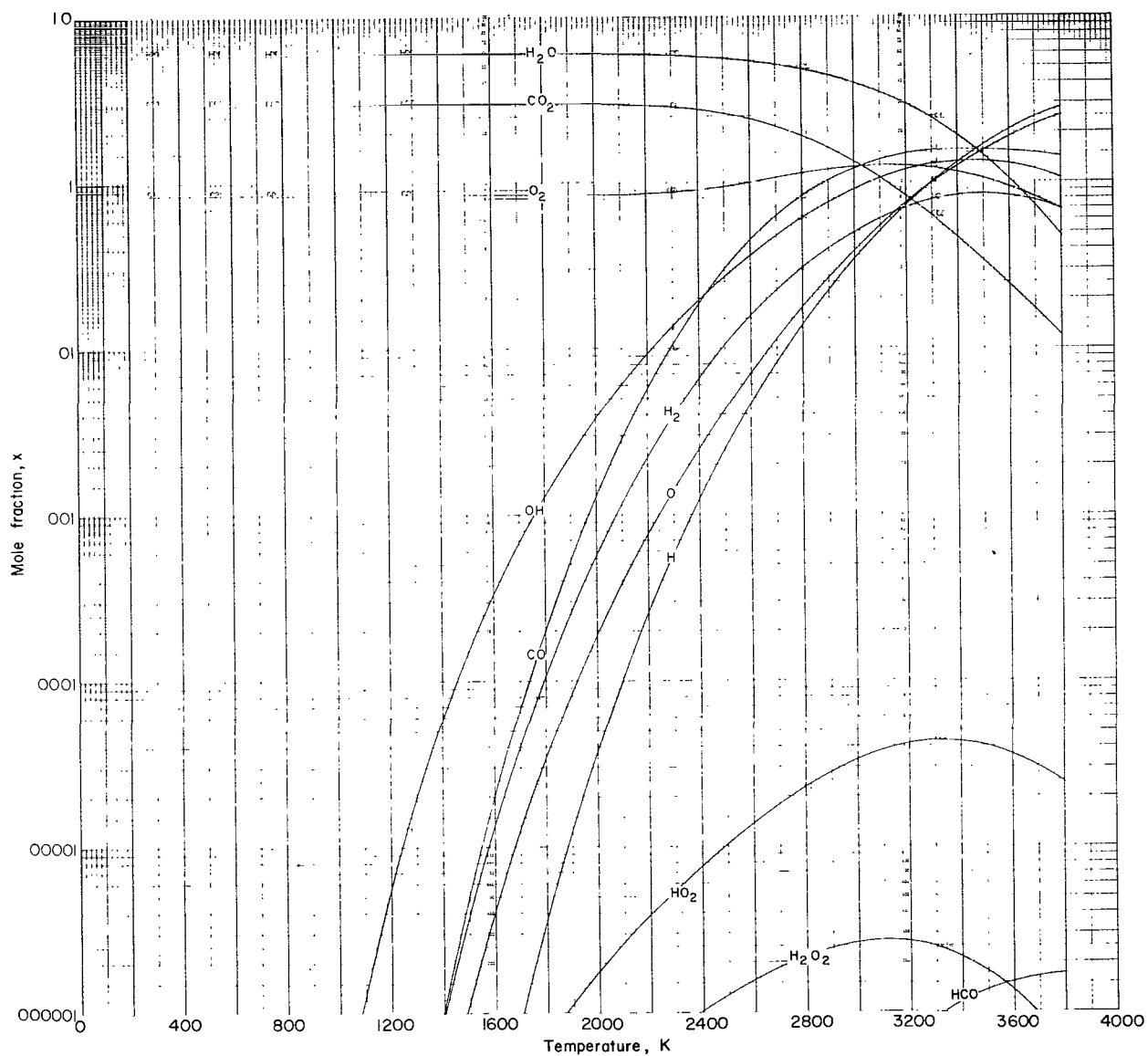
(c) Variation of composition with temperature at p = 1.0 atm.

Figure 7.- Continued.

(d) Variation of composition with temperature at p = 100 atm.

Figure 7.- Continued.
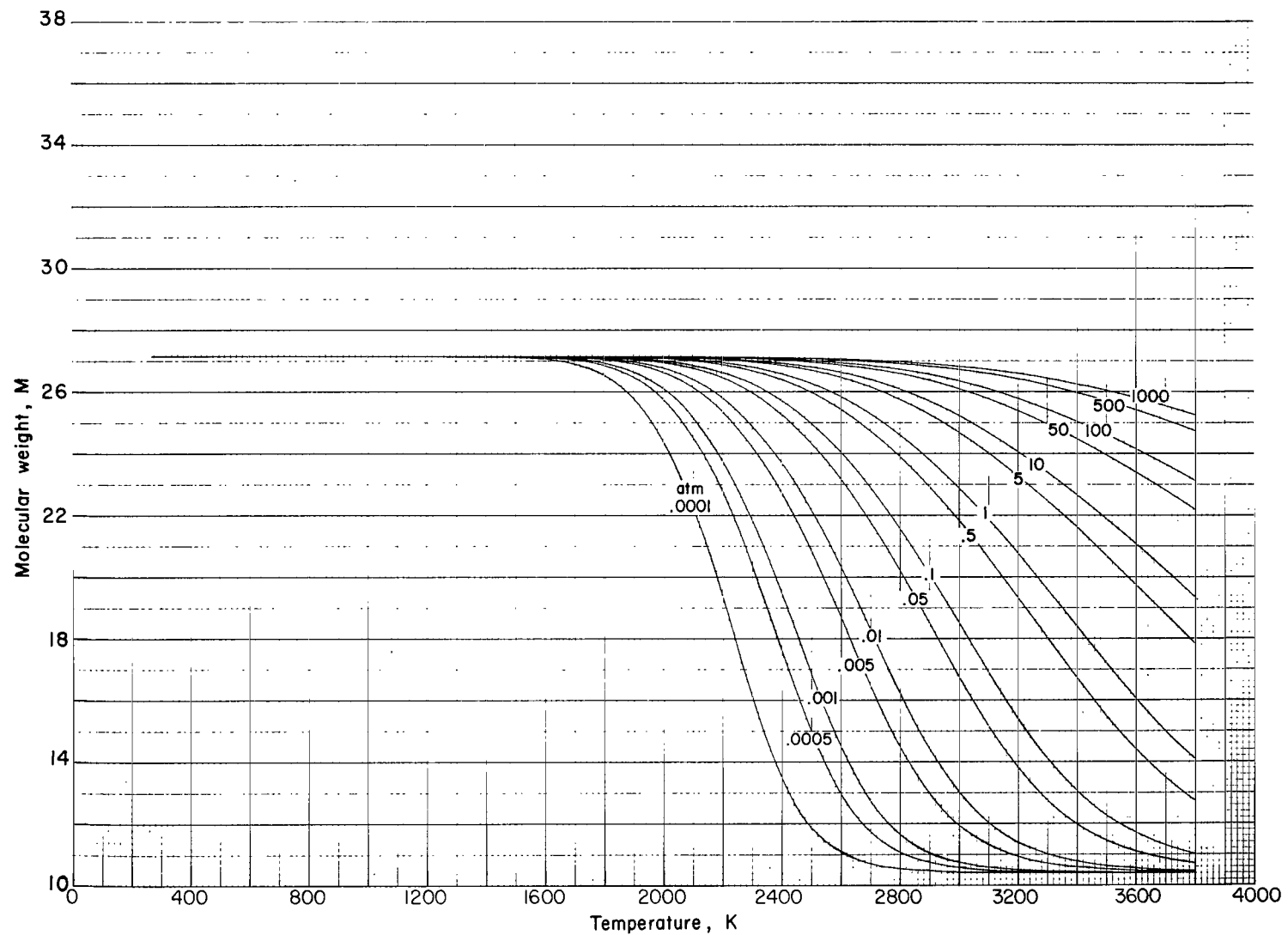
(e) Molecular weight as a function of temperature for various pressures.
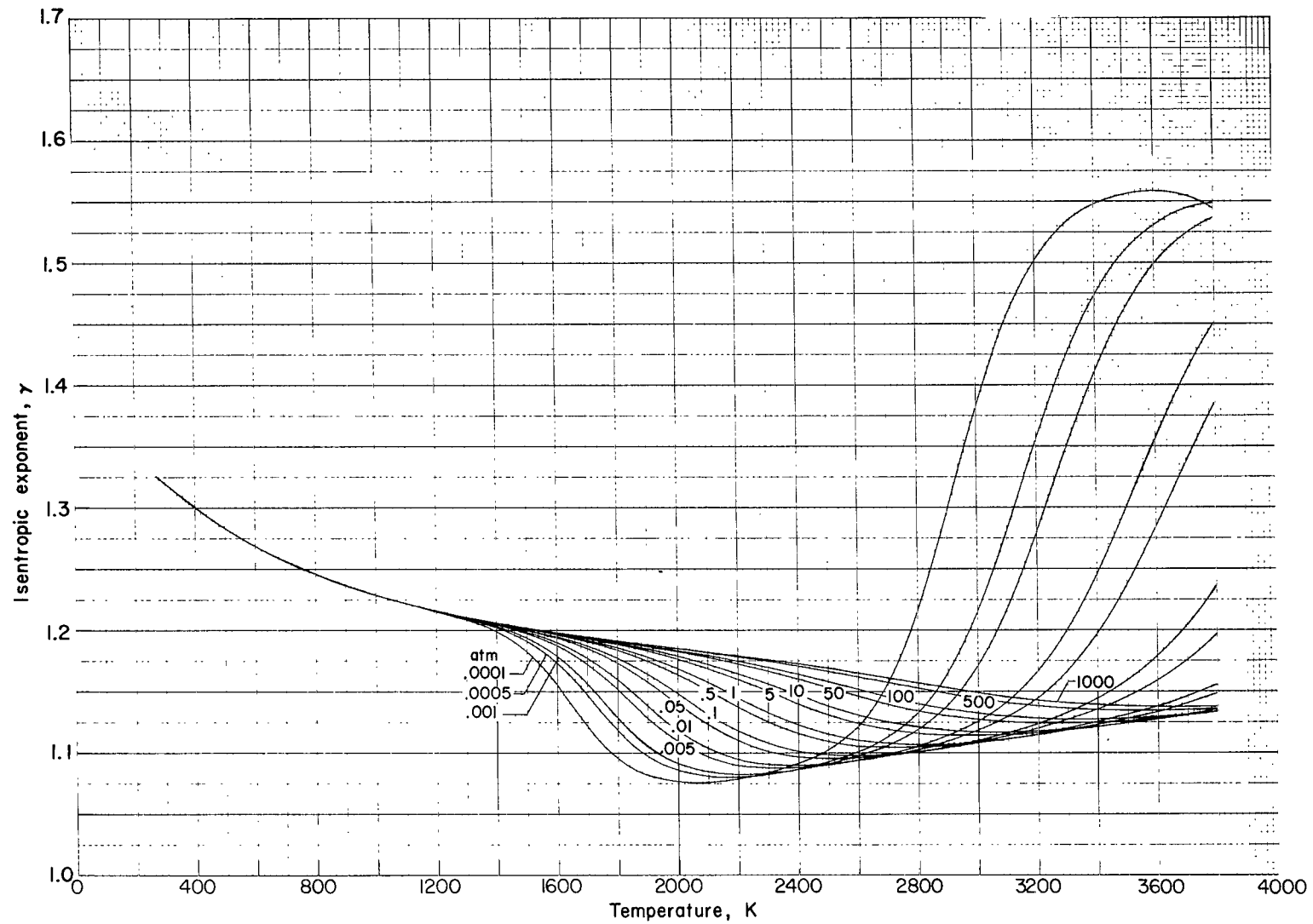
Figure 7.- Continued.

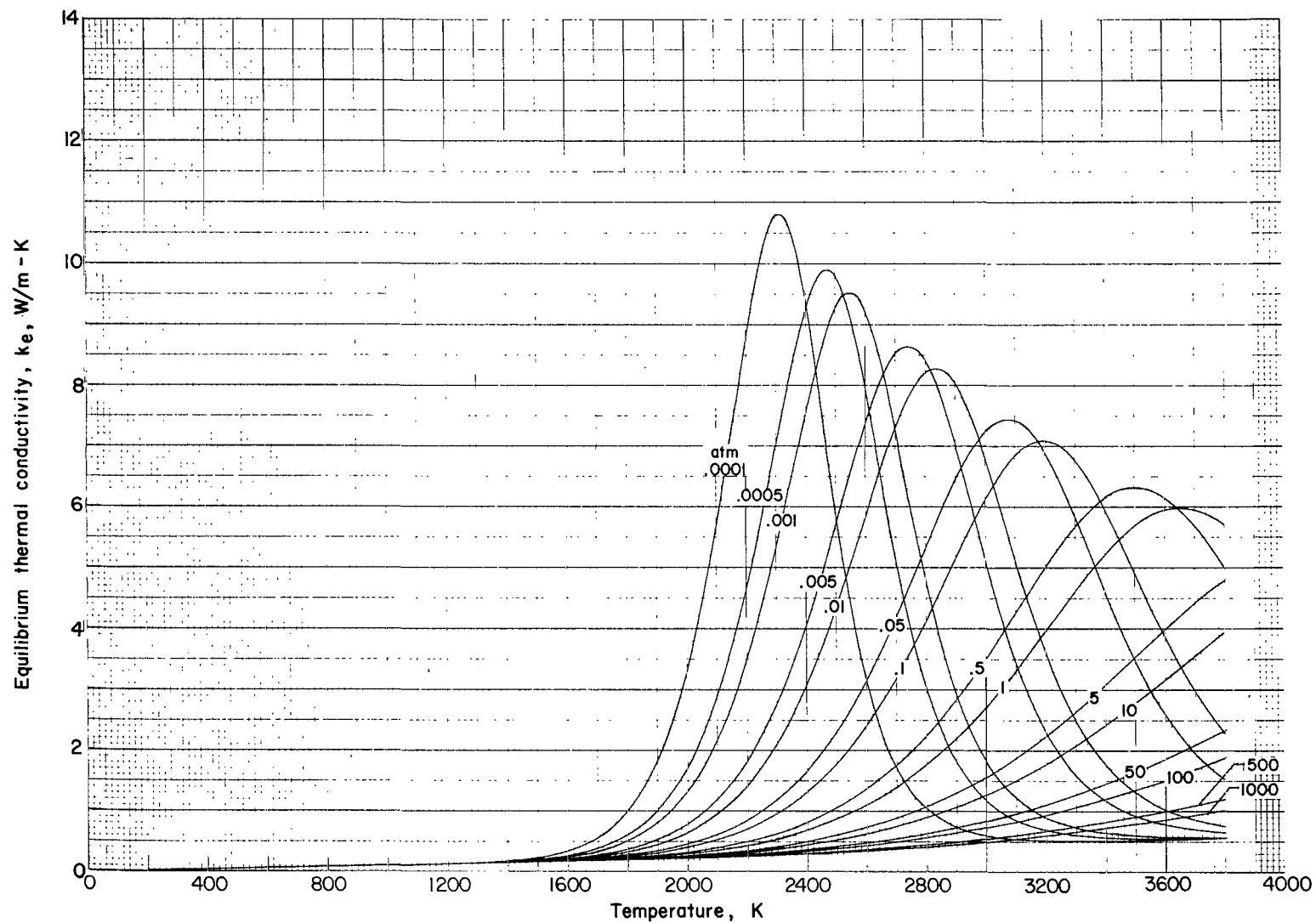(f) Isentropic exponent as a function of temperature for various pressures.

Figure 7.- Continued.

(g) Viscosity as a function of temperature for various pressures.

Figure 7.- Continued.

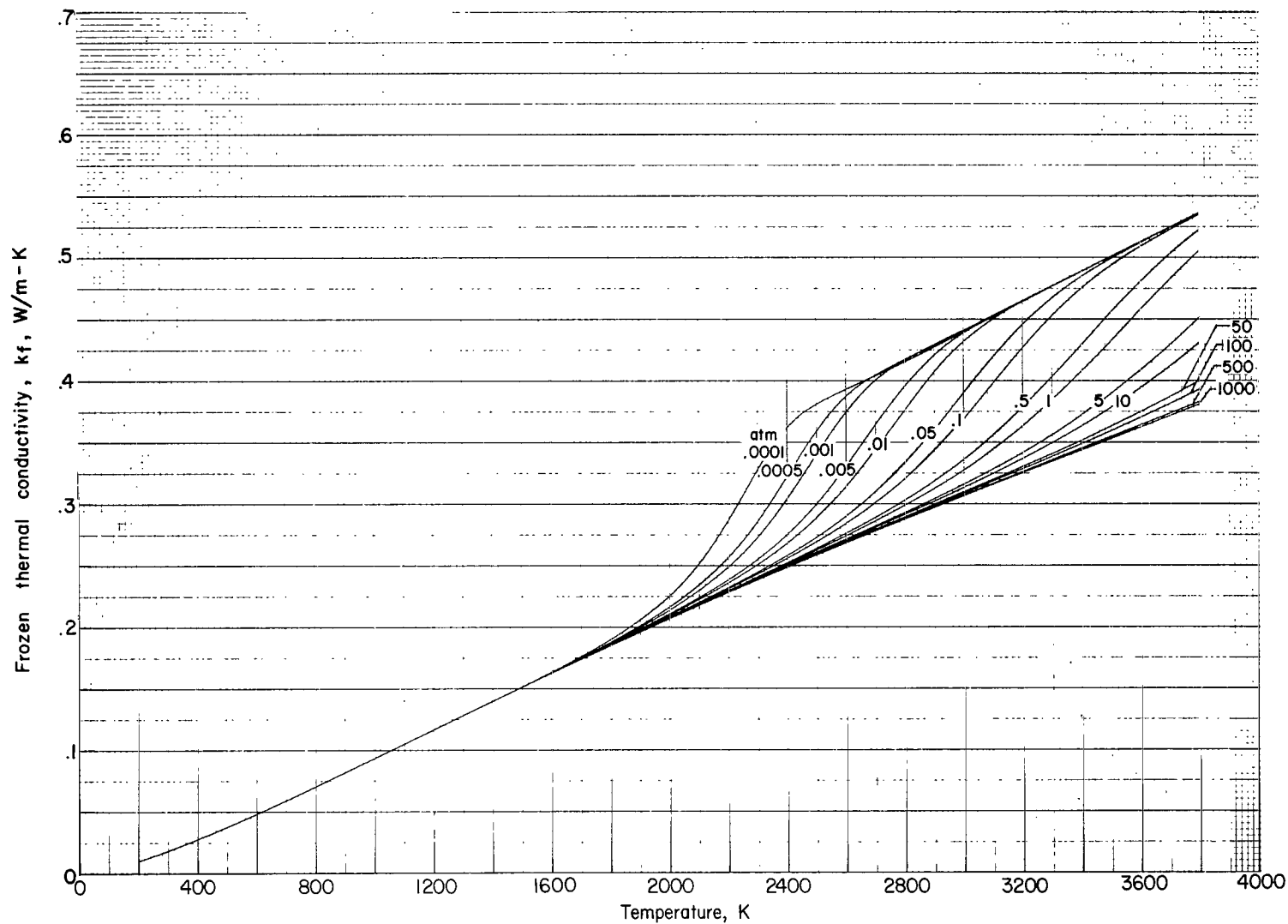(h) Equilibrium thermal conductivity as a function of temperature for various pressures.

Figure 7.- Continued.

(i) Frozen thermal conductivity as a function of temperature for various pressures.

Figure 7.- Continued.

(j) Equilibrium specific heat as a function of temperature for various pressures.

Figure 7.- Continued.

(k) Frozen specific heat as a function of temperature for various pressures.

Figure 7.- Continued.

(1) Prandtl number as a function of temperature for various pressures.

Figure 7.- Concluded.

(a) Pressure-enthalpy diagram with lines of constant temperature and entropy.

Figure 8.- Thermodynamic and transport properties of products of methane-oxygen combustion (mixture F).

(b) Variation of composition with temperature at p = 0.01 atm.

Figure 8.- Continued.
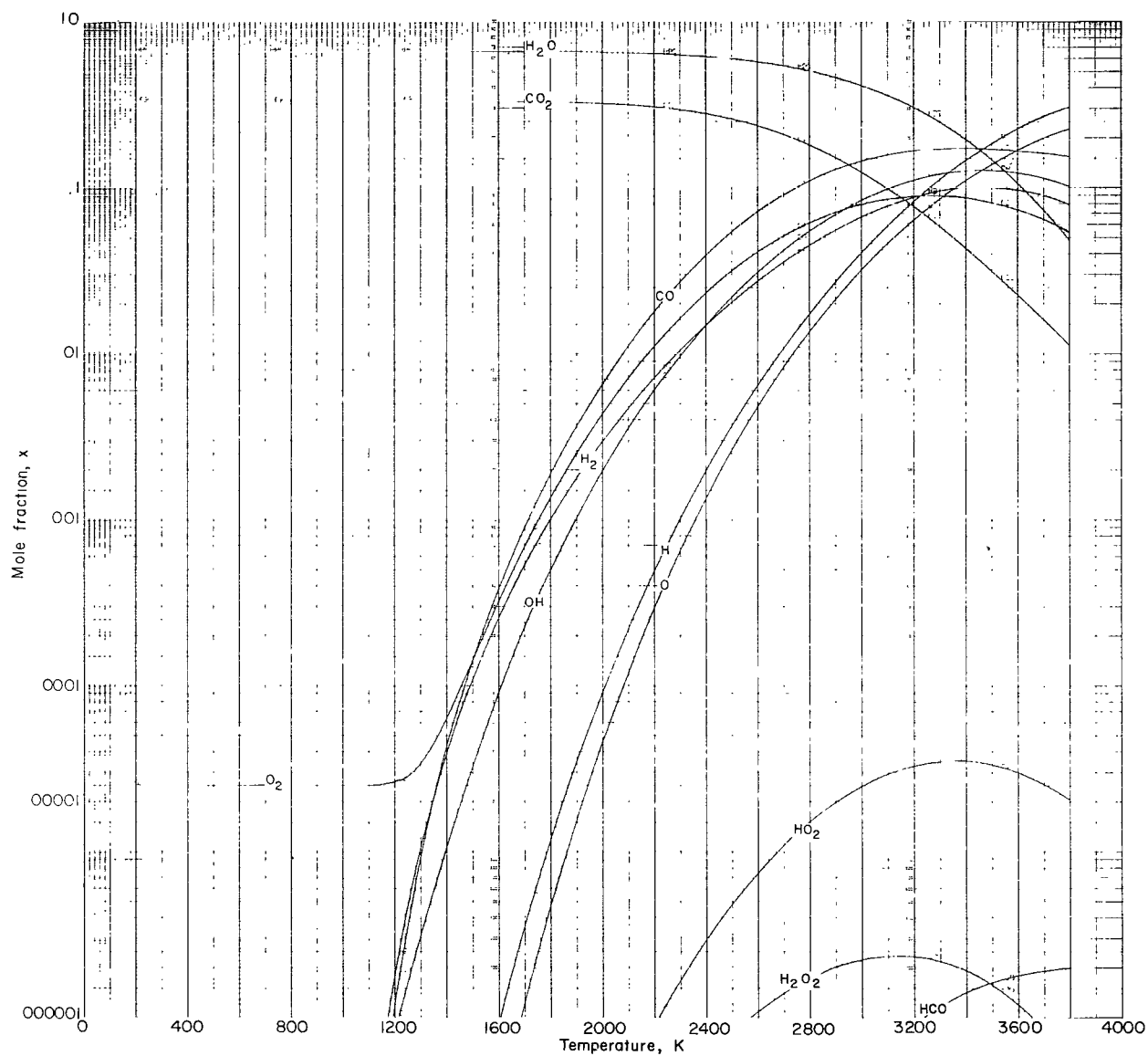
(c) Variation of composition with temperature at p = 1.0 atm.

Figure 8.- Continued.

(d) Variation of composition with temperature at p = 100 atm.

Figure 8.- Continued.
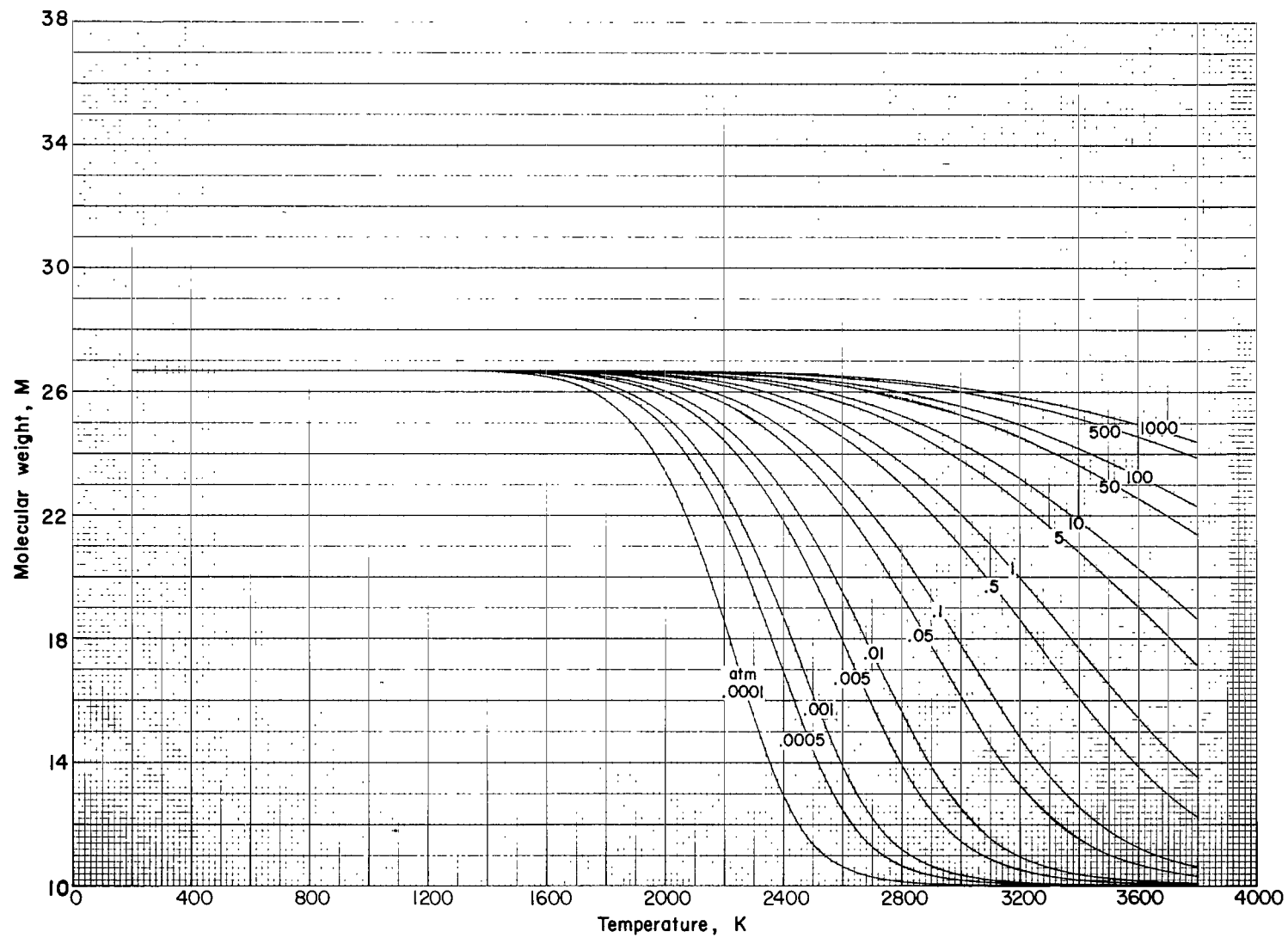
(e) Molecular weight as a function of temperature for various pressures.
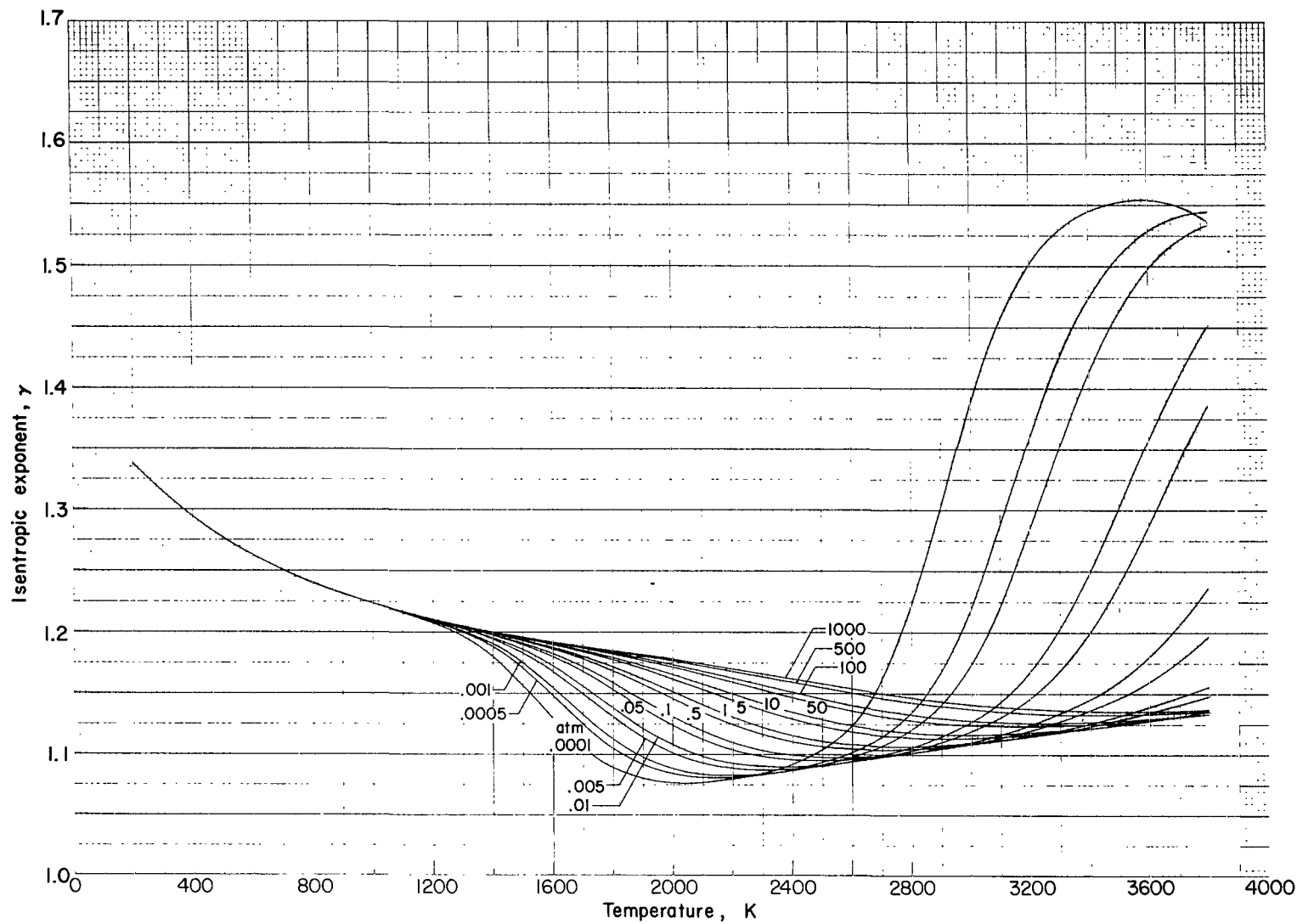
Figure 8.- Continued.

(f) Isentropic exponent as a function of temperature for various pressures.
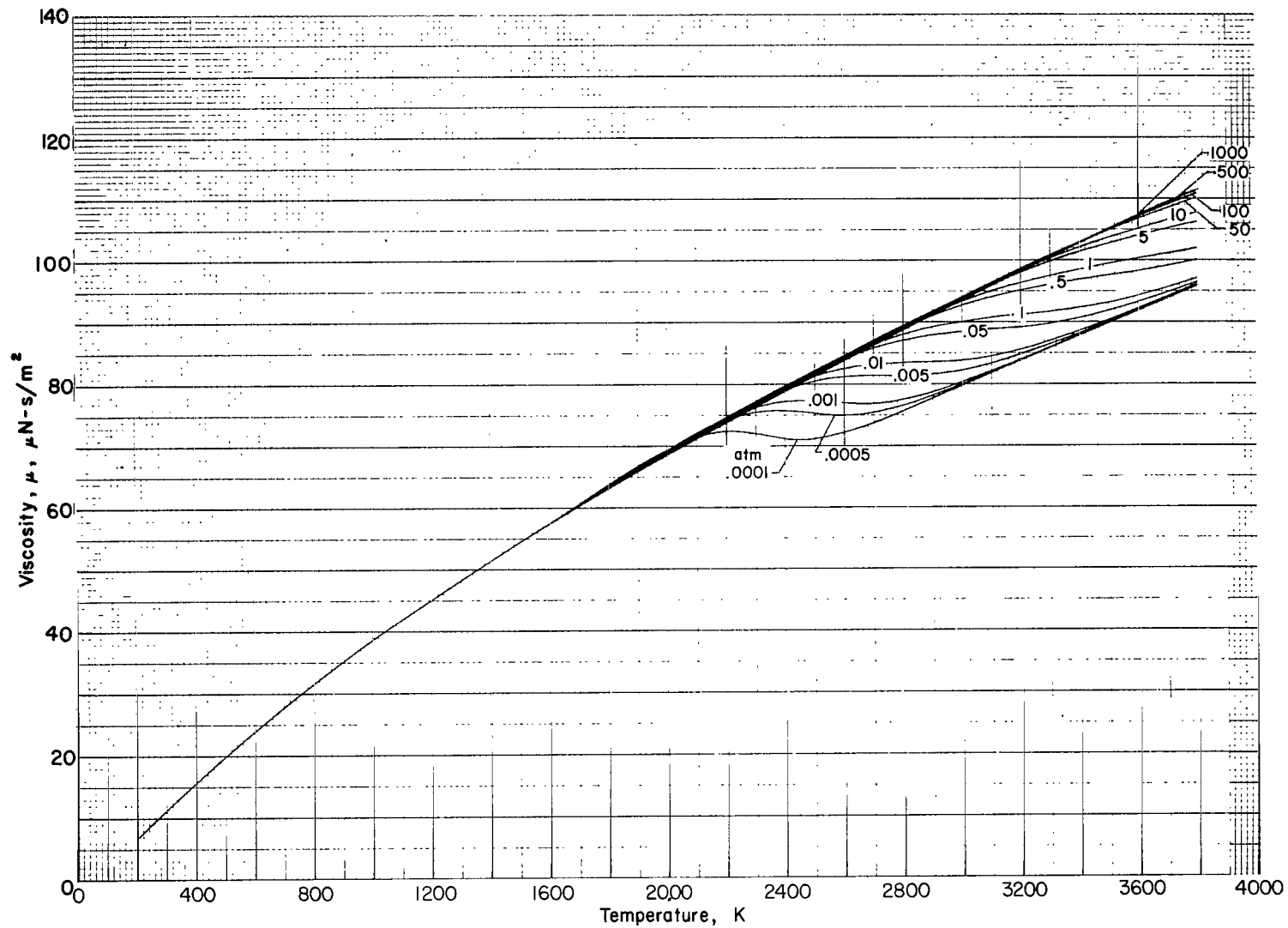
Figure 8.- Continued.

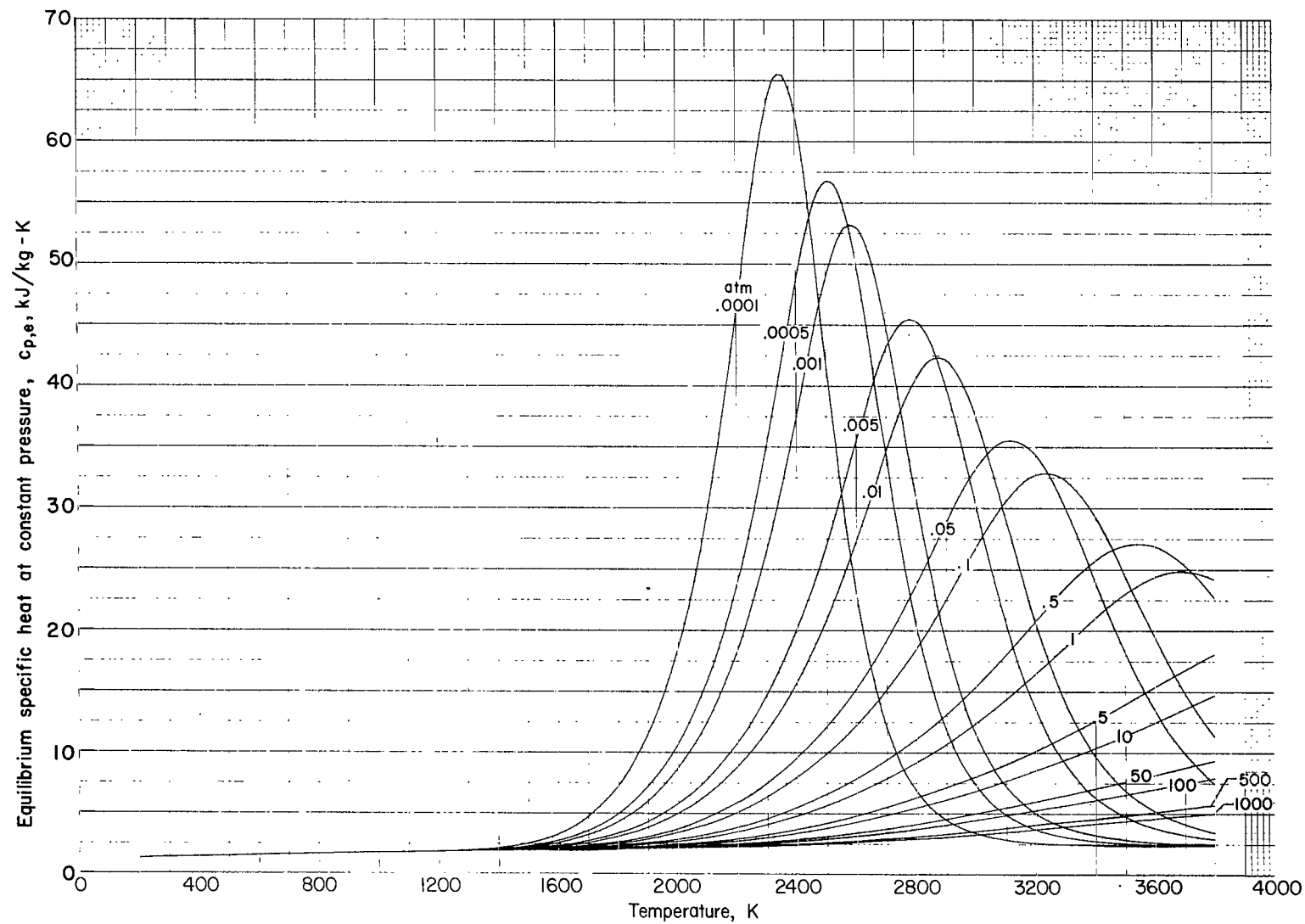(g) Viscosity as a function of temperature for various pressures.

Figure 8.- Continued.

(h) Equilibrium thermal conductivity as a function of temperature for various pressures.
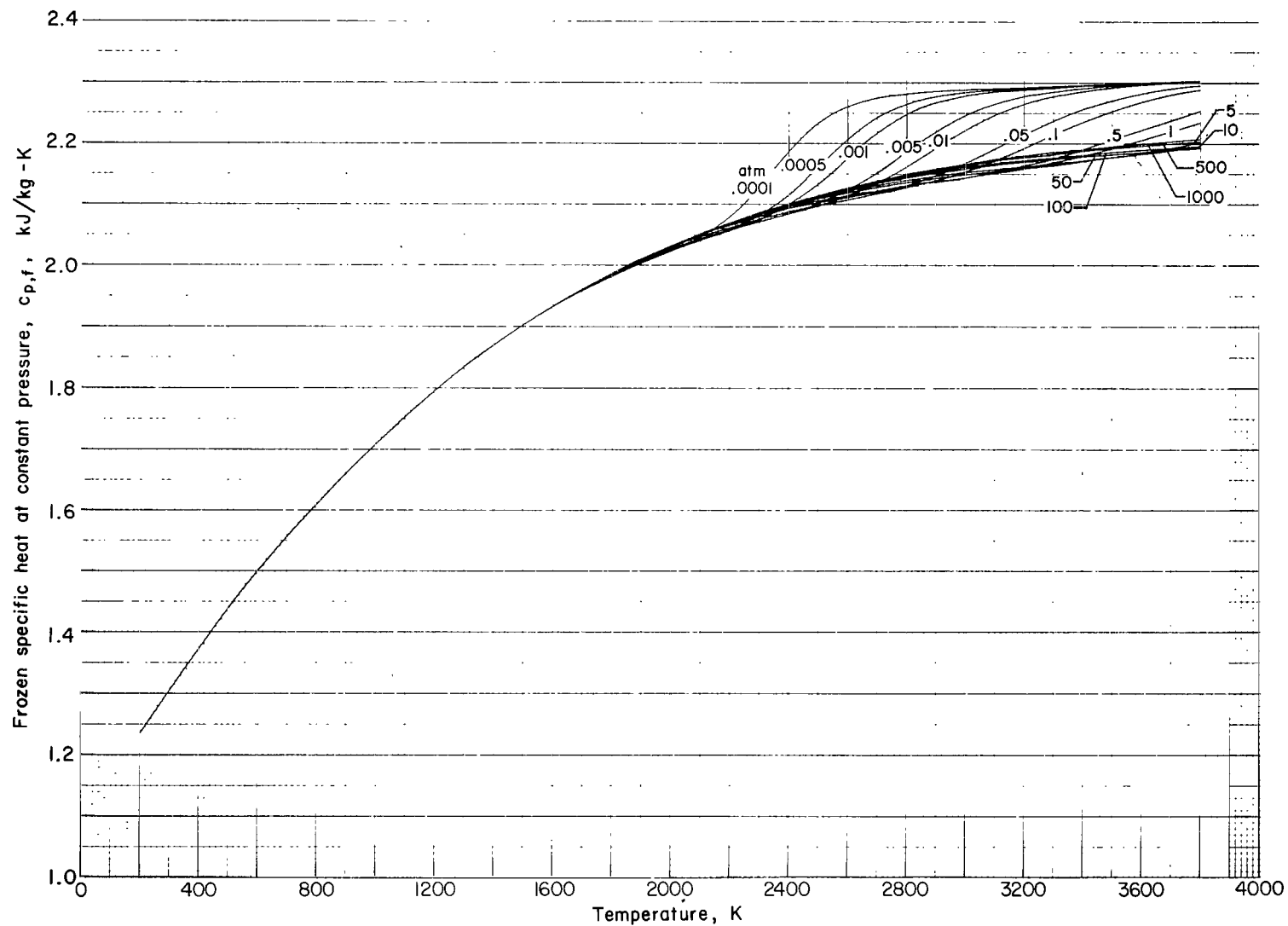
Figure 8.- Continued.

(i) Frozen thermal conductivity as a function of temperature for various pressures.
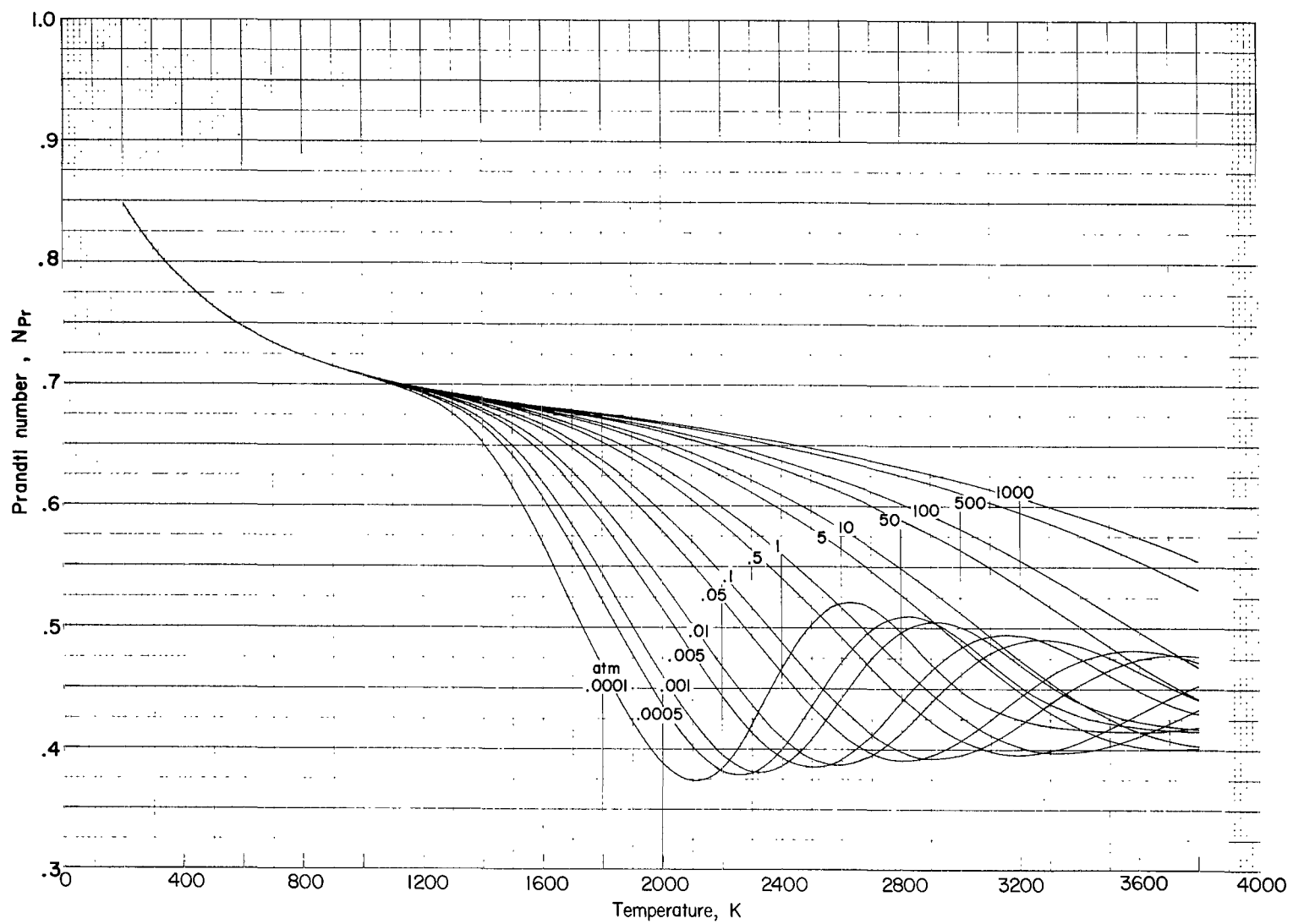
Figure 8.- Continued.

(j) Equilibrium specific heat as a function of temperature for various pressures.

Figure 8.- Continued.

(k) Frozen specific heat as a function of temperature for various pressures.

Figure 8.- Continued.

(l) Prandtl number as a function of temperature for various pressures.

Figure 8.- Concluded.