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Computations, Tables, and Approximations for Grain Boundary Diffusion Theory

R. E. Funderlic
Gale Young

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COMPUTATIONS, TABLES, AND APPROXIMATIONS FOR GRAIN BOUNDARY DIFFUSION THEORY

R. E. Funderlic and Gale Young

MARCH 1975

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COMPUTATIONS, TABLES, AND APPROXIMATIONS FOR GRAIN BOUNDARY DIFFUSION THEORY

R. E. Funderlic and Gale Young

ABSTRACT

This report complements the authors' journal article on the grain boundary diffusion theory of Fisher and Whipple. Within the standard assumptions and approximations of this theory, some new tables have been computed for the concentration in the grain boundary and for the average concentration in slices cut parallel to the free surface in sectioning experiments. Also tabulated are some related quantities for use in connection with asymptotic and other approximations.

The pertinent integrals were evaluated by several techniques. An adaptive Newton-Cotes routine was found to be the most effective.

I. INTRODUCTION AND EQUATIONS

It is intended that this report be a numerical complement to the authors' journal article [10] on grain-boundary diffusion theory. We expect that it would be helpful to refer to the journal article while reading this report. However, we do give a brief review.

Following Fisher [1], we picture a grain boundary as a thin slab extending into a semi-infinite crystal (Fig. 1). The diffusion coefficient is high in the grain boundary and low in the crystal. The diffusing material has zero initial concentration throughout the solid and is then maintained at unit concentration at the free surface from zero time onward.

Deep diffusion takes place mainly by flow along the y direction in the grain boundary, followed by sidewise spreading into the crystal.

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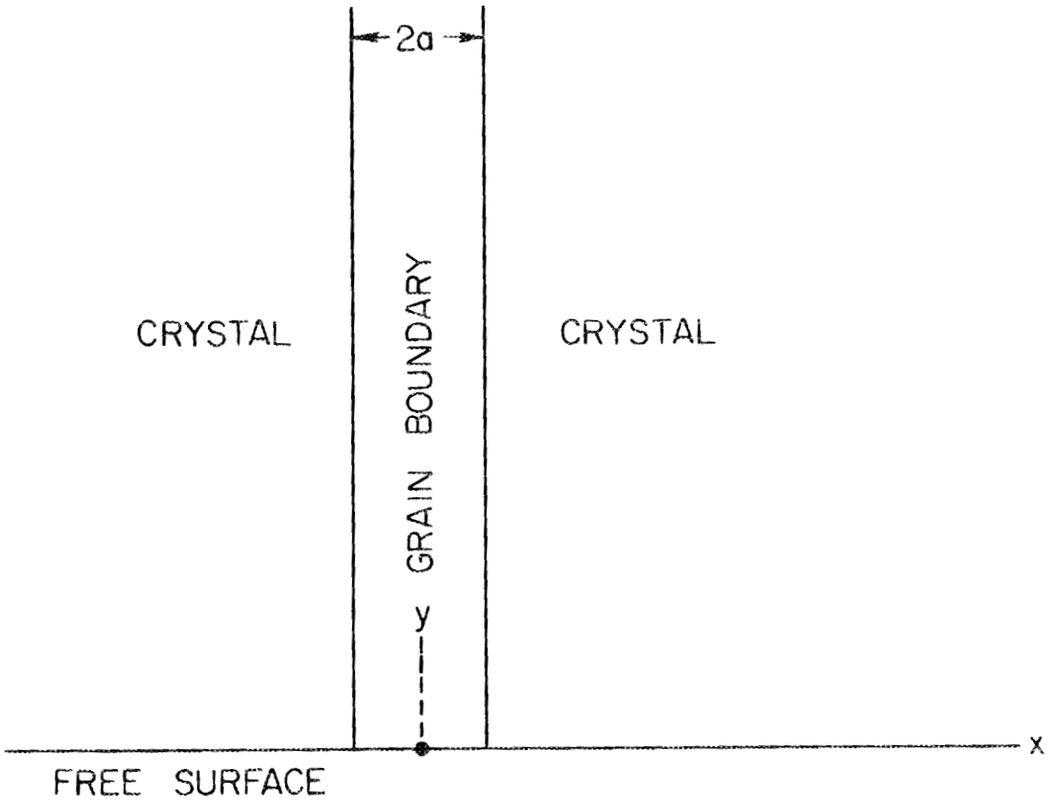

Fig. 1. The Model used for Grain Boundary Calculations.

Because the grain boundary is thin and has a high diffusion coefficient D', the concentration variations across its thickness $2a$ are assumed to be negligible, so that $C = C(y,t)$. The governing equation in the grain boundary is then

$$aD'\partial^2 C/\partial y^2 = a\partial C/\partial t + f(y,t) , \tag{1}$$

where f is the rate of sidewise flow into unit area of the interface at $x = a$ between the crystal and the grain boundary.

We further assume that essentially all of the diffusing material spreads sidewise into the crystal, so that the first term on the right may be neglected and Equation (1) reduces to

$$aD'\partial^2 C/\partial y^2 = f(y,t) .$$

Then [10] the concentration in the crystal is given [9] by the Whipple formula $C = C_1 + C_2$, where

$$C_1 = \mathrm{erfc}(\eta/2)$$

and

$$C_2 = 2\pi^{-1/2}\int_0^{\eta/2} \exp(-\sigma^2)\mathrm{erfc}(G^2/(8\sigma^2) - 1/(2\beta) + \xi/2)d\sigma$$

are expressed in terms of the dimensionless variables

$$\eta = y(Dt)^{-1/2},\ \xi = (x-a)(Dt)^{-1/2},\ \Delta = D'/D$$

$$\beta = a\Delta(Dt)^{-1/2},\ G = \eta\beta^{-1/2} ,$$

where D is the diffusion coefficient in the crystal.

The present report is concerned with the numerical evaluation of C at $\xi = 0$ (which is the concentration in the grain boundary), and the integral of C_2 over ξ from 0 to ∞ (which is proportional to the

average concentration in a deep lying slice cut parallel to the free surface). Those quantities are functions of G and β. The first is

$$C = \operatorname{erfc}(\eta/2) + 2\pi^{-1/2}\int_0^{\eta/2} \exp(-x^2)\operatorname{erfc} V\, dx \ , \tag{2}$$

where

$$V = G^2/(8x^2) - 1/(2\beta) \ , \ \eta = G\beta^{1/2} \ ,$$

while the second which is discussed by LeClaire [6] is given by

$$\overline{C} = 4\pi^{-1/2}\int_0^{\eta/2} \exp(-x^2)\left[\pi^{-1/2}\exp(-V^2) - V\operatorname{erfc} V\right]dx \ . \tag{3}$$

Table 1 gives C for $\beta = \infty$. In this case

$$C_\infty = 2\pi^{-1/2}\int_0^\infty \exp(-x^2)\operatorname{erfc} V\, dx \ , \quad V = G^2/(8x^2) \ . \tag{4}$$

Table 10 gives $\overline{C}$ for $\beta = \infty$. In this case

$$\overline{C}_\infty = 4\pi^{-1/2}\int_0^\infty \left[\pi^{-1/2}\exp(-V^2) - V\operatorname{erfc} V\right]e^{-x^2}dx \ , \ V = G^2/(8x^2) \ . \tag{5}$$

The usefulness of certain derivatives, e.g., $\phi' = -C'/C$, will be developed in Section III. Numerical values for these derivatives appear in Tables 1-18 and may be calculated from the following formulae. In each instance a change of variables gives the second formula for each derivative. For β finite we have

$$\begin{aligned} dC/dG &= -(G/\pi)\int_0^u x^{-2}\exp(-x^2-V^2)dx \\ &= -(2^{3/2}/\pi)\int_s^\infty \exp\left[-G^2/(8x^2)-(x^2-s^2)^2\right]dx \ , \end{aligned} \tag{6}$$

and

$$d\overline{C}/dG = -G\pi^{-1/2}\int_0^u x^{-2}\exp(-x^2)\mathrm{erfc}(V)dx + (2\beta^{1/2}/\pi)\exp(-u^2)$$

$$= -2^{3/2}\pi^{-1/2}\int_s^\infty \exp\left[-G^2/(8x^2)\right]\mathrm{erfc}(x^2-s^2)dx + (2\beta^{1/2}/\pi)\exp(-u^2) \ , \qquad (7)$$

where $V = G^2/(8x^2) - 1/(2\beta)$, $u^2 = \beta G^2/4$, and $s = (2\beta)^{-1/2}$.

For β infinite we have

$$dC/dG = -(G/\pi)\int_0^\infty x^{-2}\exp(-x^2-V^2)dx$$

$$= -(2^{3/2}/\pi)\int_0^\infty \exp(-x^4-V^2)dx \ , \qquad (8)$$

and

$$d\overline{C}/dG = -G\pi^{-1/2}\int_0^\infty x^{-2}\exp(-x^2)\mathrm{erfc}(V)dx$$

$$= -2^{3/2}\pi^{-1/2}\int_0^\infty \exp(-V)\mathrm{erfc}(x^2)dx \ , \qquad (9)$$

where $V = G^2/(8x^2)$.

II. ASYMPTOTIC APPROXIMATIONS

Let

$$a = 2^{11/6}\ (3\pi)^{-1/2}\ G^{-2/3}\ \exp(-3G^{4/3}/2^{8/3})\ .$$

Whipple [9] gave the following asymptotic formula:

$$C \simeq a\ \exp\left[G^{2/3}(1-\beta\xi)/(2^{4/3}\beta)\right]\ . \tag{10}$$

In Table 1, since $\beta = \infty$, we let

$$A = CG^{2/3}\ \exp(3G^{4/3}/2^{8/3})\ . \tag{11}$$

Thus we can expect that

$$\lim_{G \to \infty} A = 2^{11/6}(3\pi)^{-1/2} = 1.1608\ . \tag{12}$$

Although Table 1 has a maximum value of $G = 15$ with $A(15) = 1.1214$, we computed some values of A for large G, e.g., $A(70) = 1.1554$ and $A(80) = 1.1562$. Here we were already nearing the limits of the usual floating point arithmetic on our machine (IBM 360/91) since $C(80) \simeq (1.16)10^{-72}$.

Also from Equation (10),

$$C \simeq a\ \exp\left[G^{2/3}/(2^{4/3}\beta)\right]\exp(-G^{2/3}\ \xi/2^{4/3})\ . \tag{13}$$

In Tables 2-9 we let

$$A = CG^{2/3}\ \exp\left[3G^{4/3}/2^{8/3} - G^{2/3}/(2^{4/3}\beta)\right]\ . \tag{14}$$

Again we can expect that Equation (12) will be satisfied.

As was mentioned, Le Claire has discussed an integral (3) which is important in sectioning experiments. Integration of Equation (13) over ξ from 0 to ∞ gives an asymptotic formula for the integral (3):

$$\overline{C} \simeq pG^{-4/3} \exp(-3G^{4/3}/2^{8/3})\exp\left[G^{2/3}/(2^{4/3}\beta)\right] ,$$

where $p = 2^{1/6}\ 8(3\pi)^{-1/2}$. Here $\overline{C}$ differs from the $\overline{C}$ in our related paper [10] by a factor of $(DT)^{1/2}$.

In Table 10, since $\beta = \infty$, we let

$$\overline{A} = \overline{C}G^{4/3} \exp(3G^{4/3}/2^{8/3}) \ . \tag{15}$$

We can expect

$$\lim_{G \to \infty} \overline{A} = 2^{1/6}\ 8(3\pi)^{-1/2} = 2.9250 \ .$$

Our experience for large G was

$$\overline{A}(50) = 2.8475 \ , \quad \overline{A}(60) = 2.8638 \ ,$$
$$\overline{A}(70) = 2.8749 \ , \quad \overline{A}(80) = 2.8829 \ .$$

In Tables 11-18, $\overline{A}$ has the additional factor

$$\exp\left[-G^{2/3}/(2^{4/3}\beta)\right] \ . \tag{16}$$

The above asymptotic formulae give the motivation for Tables 19 and 20 since

$$\log\left[C(G,\beta)/C(G,\infty)\right] = \log\left[\overline{C}(G,\beta)/\overline{C}(G,\infty)\right] = G^{2/3}/(2^{4/3}\beta) \ . \tag{17}$$

Thus for large G the values in Tables 19 and 20 should tend to

$$2^{-4/3} = 0.39685 \ .$$

III. ANOTHER APPROXIMATION WITH EXAMPLES

A convenient approximation for concentration that has appeared in the literature [6,7] is

$$\phi = -\log C \simeq \alpha + bG^{\gamma} . \tag{18}$$

One could use nonlinear least squares and the tabulated values for ϕ in Table 1 to obtain useful α, b and γ. Reciprocal ϕ as a weight may improve slightly the relative accuracy of the fit. A technique illustrated in the following example should be useful to those without quick access to a computer. Also, it can provide good initial estimates for a nonlinear least squares procedure.

Example: Let $\phi' = d\phi/dG$. Then

$$\gamma - 1 = d \log \phi'/d \log G \simeq \Delta \log \phi'/\Delta \log G , \tag{19}$$

and

$$b\gamma = \phi' G^{1-\gamma} . \tag{20}$$

For our example we choose $G = 3$ and $G = 10$ and, as suggested by (19), pass a straight line through the points $[\log 3, \log \phi'(3)]$ and $[\log 10, \log \phi'(10)]$. This gives

$$\gamma - 1 = [\log \phi'(10) - \log \phi'(3)]/(\log 10 - \log 3) ,$$

or

$$\gamma = 1.24014 .$$

Take $\gamma = 1.24$. Then by (20) and Table 1, b is found to be 0.65748 by use of (19) at either point. Using these values for γ and b at the point $G = 3$, Equation (18) gives $\alpha = 0.27378$, while at $G = 10$, we obtain $\alpha = 0.19631$.

In order to distribute the relative error more uniformly throughout the interval, we take the average of these values, namely $\alpha = 0.23505$ or $\exp(-\alpha) = 0.7905$. This makes $|\log \hat{C}/C|$ have equal values at $G = 3$ and $G = 10$, where C is the value calculated from (4), which appears in Table 1, and $\hat{C}$ is the approximate value given by (21). This is nearly the same as equalizing $|(\hat{C}-C)/C|$ at the two points. Alternatively, α may easily be determined by exactly equalizing the absolute percentage error at $G = 3$ and $G = 10$.

Table 21 was produced by using

$$\hat{C} = 0.7905 \exp(-0.6575G^{1.24}) . \tag{21}$$

Furthermore, Table 21 uses

$$\tilde{C} = 0.7087125 \exp(-0.6349652G^{1.249245}) .$$

The parameters for $\tilde{C}$ were obtained from a nonlinear least squares fit. Concentration data from Table 1 with $G = 3, 4, 5, \ldots, 10$ was used to obtain these parameters. The computer program used was received from Professor G. Golub of Stanford University and was based on a paper of Golub and Pereyra [3]. The least squares scheme requires only an estimate for γ, as b and α are obtained from a linear least squares scheme during each iteration to obtain γ.

IV. PROGRAMMING AND NUMERICAL CONSIDERATIONS

The integrals (2-9, inclusive) were evaluated on an IBM 360, Model 91. We experimented with several numerical integration subroutines [2, 4, 5, 8]. We implemented all of our routines in double precision because our computer costs little extra for this. We found a double precision implementation of CCQUAD [2] to be a particularly good general routine. CCQUAD uses an automatic strategy based on the Clemshaw-Curtis quadrature formula [2]. "Automatic" here means that when the calculated estimated error is more than a predetermined desirable value, the number of integrand calculations increases in an attempt to improve the calculated integral. R. Jones of Sandia at Albuquerque made extensive comparisons with several available routines after we gave him CCQUAD. His results are available in our Computer Library. CCQUAD and the other routines we tried did not do as well as ANC6 [4], which is specially suited to the shape of our integrands. A typical integrand appears in Figure 2. This integrand, $\exp(-x^2)\mathrm{erfc}(1/(8x^2))$, is based on Equation (4) with $G = 1$. Our experience was that although the peaks of the integrands shift in position and height, the widths remain almost constant with increasing G. ANC6 [4] is an adaptive 7-point Newton Cotes routine. "Adaptive" means that the routine automatically uses more integrand evaluations where the integrand changes most rapidly. With our minimal knowledge of ANC6, it appears that the user must supply an estimate of the absolute error that he is willing to tolerate. Therefore, the user must know the approximate answer. As G changes, we use the last value of an integral times 10^{-8} as the new error tolerance. For large G and indeed for any isolated calculation of

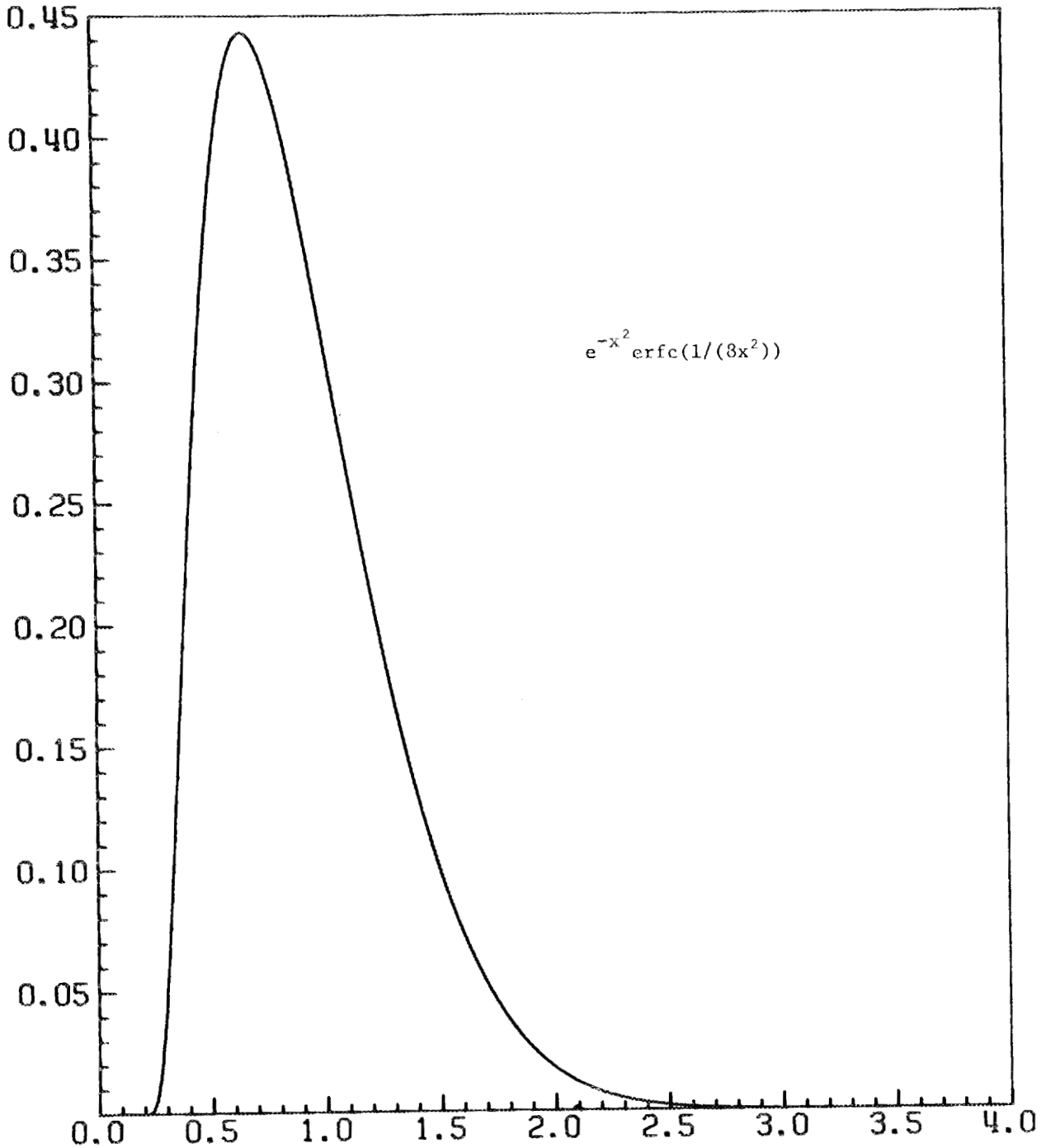

Figure 2. Typical Integrand

the integrals, the asymptotic approximation of Section II can provide error estimates to an integration program. A listing to prepare Table 1 appears in the Appendix.

Although both formulas for each of (6, 7, 8, 9) were used with equal results, the second formula in each case was used to prepare Tables 1-18.

Probably the double precision could be changed to single. Also, other strategies could be incorporated to improve efficiency, e.g., take advantage of the location of the integrand peaks. Since the computational costs at our installation are low, no attempt was made to implement many efficiency improvements. The approximate IBM 360/91 time and cost to produce Table 1, including compilation, computation, and input-output, were 3.8 seconds and $0.45, respectively. Typical of the efficiency of calculating the integrals was the 157 integrand evaluations for C at $\beta = \infty$, $G = 5$. With a less stringent error tolerance, 10^{-4} versus 10^{-8}, the number of integrand evaluations dropped to 61 and still gave four digits of accuracy except for small G.

Since for $L > 175$, e^{-L} is set to zero on our computer, we set the upper limit of integration of the integrals in (2, 3, 4, 5, 6, 7, 8) to 13.5 and in (8) to 4. All of the calculated integrals have integrands not defined at 0 without taking limits. In each case we set the integrand to its limit 0 without numerical difficulties.

V. GUIDE TO TABLES

Table 1 gives the concentration C at $\beta = \infty$. The calculation of this concentration makes use of Equation (4). The values for A are obtained from the asymptotic formula (11). The symbol ϕ stands for $-\log C$ and its usefulness is described in Section III. The derivative of ϕ, ϕ', used in Section III is calculated from Equation (8). Similarly, $\overline{C}$ at $\beta = \infty$ is calculated from (5), $\overline{A}$ from (15), and $\overline{\phi}'$ from (9). These make up the contents of Table 10.

For β finite C is calculated from (2), A from (14), and ϕ' from (6). These make up the contents of Tables 2–9 where $\beta = 100, 10, 5, 2, 1, 1/2, 2/10, 1/10$, respectively. Similarly, $\overline{C}$ is calculated from (3), $\overline{A}$ from (16), and $\overline{\phi}'$ from (7). These make up the contents of Tables 11–18 for the various values of β. Tables 19 and 20 were motivated by (17). Table 21 was motivated by the example in Section III.

TABLES

TABLE 1
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR $\beta = \infty$

G	C	A	LOG(G)	ϕ	ϕ'	LOG(ϕ')
0.0	1.0000D 00	0.0		0.0	8.1605D-01	-2.0328D-01
0.2	8.4771D-01	3.0638D-01	-1.6094D 00	1.6522D-01	8.3604D-01	-1.7908D-01
0.4	7.1579D-01	4.4665D-01	-9.1629D-01	3.3437D-01	8.5534D-01	-1.5626D-01
0.6	6.0211D-01	5.4402D-01	-5.1083D-01	5.0731D-01	8.7401D-01	-1.3466D-01
0.8	5.0463D-01	6.1766D-01	-2.2314D-01	6.8393D-01	8.9209D-01	-1.1419D-01
1.0	4.2143D-01	6.7595D-01	0.0	8.6411D-01	9.0962D-01	-9.4732D-02
1.2	3.5073D-01	7.2346D-01	1.8232D-01	1.0477D 00	9.2663D-01	-7.6198D-02
1.4	2.9091D-01	7.6303D-01	3.3647D-01	1.2347D 00	9.4317D-01	-5.8510D-02
1.6	2.4051D-01	7.9654D-01	4.7000D-01	1.4250D 00	9.5925D-01	-4.1600D-02
1.8	1.9821D-01	8.2528D-01	5.8779D-01	1.6184D 00	9.7492D-01	-2.5404D-02
2.0	1.6285D-01	8.5021D-01	6.9315D-01	1.8149D 00	9.9018D-01	-9.8698D-03
2.2	1.3339D-01	8.7203D-01	7.8846D-01	2.0145D 00	1.0051D 00	5.0529D-03
2.4	1.0894D-01	8.9128D-01	8.7547D-01	2.2169D 00	1.0196D 00	1.9407D-02
2.6	8.8720D-02	9.0838D-01	9.5551D-01	2.4223D 00	1.0338D 00	3.3233D-02
2.8	7.2048D-02	9.2366D-01	1.0296D 00	2.6304D 00	1.0477D 00	4.6566D-02
3.0	5.8349D-02	9.3740D-01	1.0986D 00	2.8413D 00	1.0612D 00	5.9438D-02
3.2	4.7128D-02	9.4980D-01	1.1632D 00	3.0549D 00	1.0745D 00	7.1878D-02
3.4	3.7964D-02	9.6105D-01	1.2238D 00	3.2711D 00	1.0875D 00	8.3914D-02
3.6	3.0504D-02	9.7130D-01	1.2809D 00	3.4899D 00	1.1003D 00	9.5568D-02
3.8	2.4448D-02	9.8067D-01	1.3350D 00	3.7112D 00	1.1128D 00	1.0686D-01
4.0	1.9546D-02	9.8926D-01	1.3863D 00	3.9350D 00	1.1250D 00	1.1782D-01
4.2	1.5589D-02	9.9717D-01	1.4351D 00	4.1612D 00	1.1371D 00	1.2846D-01
4.4	1.2403D-02	1.0045D 00	1.4816D 00	4.3898D 00	1.1489D 00	1.3880D-01
4.6	9.8454D-03	1.0112D 00	1.5261D 00	4.6208D 00	1.1605D 00	1.4885D-01
4.8	7.7972D-03	1.0175D 00	1.5686D 00	4.8540D 00	1.1719D 00	1.5863D-01
5.0	6.1611D-03	1.0233D 00	1.6094D 00	5.0895D 00	1.1831D 00	1.6815D-01
5.2	4.8575D-03	1.0287D 00	1.6487D 00	5.3272D 00	1.1941D 00	1.7743D-01
5.4	3.8214D-03	1.0338D 00	1.6864D 00	5.5671D 00	1.2050D 00	1.8647D-01
5.6	2.9998D-03	1.0385D 00	1.7228D 00	5.8092D 00	1.2157D 00	1.9529D-01
5.8	2.3499D-03	1.0430D 00	1.7579D 00	6.0534D 00	1.2262D 00	2.0390D-01
6.0	1.8369D-03	1.0471D 00	1.7918D 00	6.2997D 00	1.2365D 00	2.1231D-01
6.2	1.4330D-03	1.0510D 00	1.8245D 00	6.5480D 00	1.2467D 00	2.2053D-01
6.4	1.1156D-03	1.0547D 00	1.8563D 00	6.7984D 00	1.2568D 00	2.2856D-01
6.6	8.6680D-04	1.0582D 00	1.8871D 00	7.0507D 00	1.2667D 00	2.3641D-01
6.8	6.7215D-04	1.0615D 00	1.9169D 00	7.3050D 00	1.2765D 00	2.4409D-01
7.0	5.2021D-04	1.0646D 00	1.9459D 00	7.5613D 00	1.2861D 00	2.5161D-01

7.2	4.0184D-04	1.0676D 00	1.9741D 00	7.8195D 00	1.2956D 00	2.5897D-01
7.4	3.0982D-04	1.0704D 00	2.0015D 00	8.0795D 00	1.3050D 00	2.6619D-01
7.6	2.3843D-04	1.0730D 00	2.0281D 00	8.3414D 00	1.3142D 00	2.7326D-01
7.8	1.8315D-04	1.0755D 00	2.0541D 00	8.6052D 00	1.3234D 00	2.8019D-01
8.0	1.4043D-04	1.0779D 00	2.0794D 00	8.8708D 00	1.3324D 00	2.8698D-01
8.2	1.0749D-04	1.0802D 00	2.1041D 00	9.1382D 00	1.3413D 00	2.9365D-01
8.4	8.2122D-05	1.0824D 00	2.1282D 00	9.4073D 00	1.3501D 00	3.0020D-01
8.6	6.2634D-05	1.0845D 00	2.1518D 00	9.6782D 00	1.3588D 00	3.0662D-01
8.8	4.7688D-05	1.0864D 00	2.1748D 00	9.9508D 00	1.3674D 00	3.1293D-01
9.0	3.6247D-05	1.0883D 00	2.1972D 00	1.0225D 01	1.3759D 00	3.1913D-01
9.2	2.7504D-05	1.0902D 00	2.2192D 00	1.0501D 01	1.3843D 00	3.2522D-01
9.4	2.0835D-05	1.0919D 00	2.2407D 00	1.0779D 01	1.3926D 00	3.3120D-01
9.6	1.5757D-05	1.0936D 00	2.2618D 00	1.1058D 01	1.4009D 00	3.3709D-01
9.8	1.1897D-05	1.0952D 00	2.2824D 00	1.1339D 01	1.4090D 00	3.4287D-01
10.0	8.9682D-06	1.0967D 00	2.3026D 00	1.1622D 01	1.4170D 00	3.4857D-01
10.2	6.7496D-06	1.0982D 00	2.3224D 00	1.1906D 01	1.4250D 00	3.5417D-01
10.4	5.0718D-06	1.0996D 00	2.3418D 00	1.2192D 01	1.4329D 00	3.5968D-01
10.6	3.8051D-06	1.1009D 00	2.3609D 00	1.2479D 01	1.4407D 00	3.6511D-01
10.8	2.8503D-06	1.1022D 00	2.3795D 00	1.2768D 01	1.4484D 00	3.7045D-01
11.0	2.1318D-06	1.1035D 00	2.3979D 00	1.3059D 01	1.4560D 00	3.7571D-01
11.2	1.5920D-06	1.1047D 00	2.4159D 00	1.3350D 01	1.4636D 00	3.8090D-01
11.4	1.1871D-06	1.1059D 00	2.4336D 00	1.3644D 01	1.4711D 00	3.8600D-01
11.6	8.8390D-07	1.1070D 00	2.4510D 00	1.3939D 01	1.4785D 00	3.9104D-01
11.8	6.5715D-07	1.1081D 00	2.4681D 00	1.4235D 01	1.4859D 00	3.9600D-01
12.0	4.8785D-07	1.1091D 00	2.4849D 00	1.4533D 01	1.4932D 00	4.0089D-01
12.2	3.6164D-07	1.1102D 00	2.5014D 00	1.4833D 01	1.5004D 00	4.0571D-01
12.4	2.6770D-07	1.1111D 00	2.5177D 00	1.5133D 01	1.5075D 00	4.1047D-01
12.6	1.9788D-07	1.1121D 00	2.5337D 00	1.5436D 01	1.5146D 00	4.1516D-01
12.8	1.4606D-07	1.1130D 00	2.5494D 00	1.5739D 01	1.5216D 00	4.1979D-01
13.0	1.0766D-07	1.1139D 00	2.5649D 00	1.6044D 01	1.5286D 00	4.2436D-01
13.2	7.9248D-08	1.1148D 00	2.5802D 00	1.6351D 01	1.5355D 00	4.2887D-01
13.4	5.8253D-08	1.1156D 00	2.5953D 00	1.6658D 01	1.5424D 00	4.3332D-01
13.6	4.2761D-08	1.1164D 00	2.6101D 00	1.6968D 01	1.5492D 00	4.3771D-01
13.8	3.1347D-08	1.1172D 00	2.6247D 00	1.7278D 01	1.5559D 00	4.4205D-01
14.0	2.2949D-08	1.1179D 00	2.6391D 00	1.7590D 01	1.5626D 00	4.4633D-01
14.2	1.6779D-08	1.1187D 00	2.6532D 00	1.7903D 01	1.5692D 00	4.5057D-01
14.4	1.2251D-08	1.1194D 00	2.6672D 00	1.8218D 01	1.5758D 00	4.5475D-01
14.6	8.9334D-09	1.1201D 00	2.6810D 00	1.8533D 01	1.5823D 00	4.5888D-01
14.8	6.5058D-09	1.1207D 00	2.6946D 00	1.8851D 01	1.5888D 00	4.6296D-01
15.0	4.7318D-09	1.1214D 00	2.7081D 00	1.9169D 01	1.5952D 00	4.6699D-01

TABLE 2
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β= 100.0

G	C	A	LOG(G)	Φ	Φ'	LOG(Φ')
0.0	1.0000D 00	0.0		0.0	7.5514D-01	-2.8086D-01
0.2	8.5248D-01	3.0769D-01	-1.6094D 00	1.5960D-01	8.2789D-01	-1.8888D-01
0.4	7.2035D-01	4.4852D-01	-9.1629D-01	3.2802D-01	8.5341D-01	-1.5851D-01
0.6	6.0616D-01	5.4614D-01	-5.1083D-01	5.0061D-01	8.7226D-01	-1.3667D-01
0.8	5.0820D-01	6.1991D-01	-2.2314D-01	6.7688D-01	8.9036D-01	-1.1613D-01
1.0	4.2455D-01	6.7827D-01	0.0	8.5672D-01	9.0792D-01	-9.6601D-02
1.2	3.5345D-01	7.2582D-01	1.8232D-01	1.0400D 00	9.2496D-01	-7.8006D-02
1.4	2.9327D-01	7.6540D-01	3.3647D-01	1.2267D 00	9.4152D-01	-6.0262D-02
1.6	2.4254D-01	7.9890D-01	4.7000D-01	1.4166D 00	9.5763D-01	-4.3298D-02
1.8	1.9995D-01	8.2763D-01	5.8779D-01	1.6097D 00	9.7331D-01	-2.7054D-02
2.0	1.6433D-01	8.5254D-01	6.9315D-01	1.8059D 00	9.8859D-01	-1.1473D-02
2.2	1.3465D-01	8.7433D-01	7.8846D-01	2.0051D 00	1.0035D 00	3.4928D-03
2.4	1.1000D-01	8.9355D-01	8.7547D-01	2.2073D 00	1.0180D 00	1.7888D-02
2.6	8.9609D-02	9.1062D-01	9.5551D-01	2.4123D 00	1.0323D 00	3.1752D-02
2.8	7.2792D-02	9.2587D-01	1.0296D 00	2.6201D 00	1.0462D 00	4.5121D-02
3.0	5.8969D-02	9.3957D-01	1.0986D 00	2.8307D 00	1.0597D 00	5.8027D-02
3.2	4.7643D-02	9.5195D-01	1.1632D 00	3.0440D 00	1.0730D 00	7.0499D-02
3.4	3.8391D-02	9.6317D-01	1.2238D 00	3.2599D 00	1.0861D 00	8.2565D-02
3.6	3.0856D-02	9.7338D-01	1.2809D 00	3.4784D 00	1.0988D 00	9.4249D-02
3.8	2.4737D-02	9.8272D-01	1.3350D 00	3.6995D 00	1.1113D 00	1.0557D-01
4.0	1.9782D-02	9.9128D-01	1.3863D 00	3.9230D 00	1.1236D 00	1.1656D-01
4.2	1.5782D-02	9.9915D-01	1.4351D 00	4.1489D 00	1.1357D 00	1.2722D-01
4.4	1.2560D-02	1.0064D 00	1.4816D 00	4.3772D 00	1.1475D 00	1.3758D-01
4.6	9.9730D-03	1.0131D 00	1.5261D 00	4.6079D 00	1.1591D 00	1.4765D-01
4.8	7.9004D-03	1.0194D 00	1.5686D 00	4.8408D 00	1.1705D 00	1.5746D-01
5.0	6.2444D-03	1.0252D 00	1.6094D 00	5.0761D 00	1.1818D 00	1.6700D-01
5.2	4.9245D-03	1.0306D 00	1.6487D 00	5.3135D 00	1.1928D 00	1.7630D-01
5.4	3.8751D-03	1.0356D 00	1.6864D 00	5.5532D 00	1.2037D 00	1.8536D-01
5.6	3.0428D-03	1.0403D 00	1.7228D 00	5.7950D 00	1.2143D 00	1.9420D-01
5.8	2.3842D-03	1.0447D 00	1.7579D 00	6.0389D 00	1.2249D 00	2.0283D-01
6.0	1.8642D-03	1.0489D 00	1.7918D 00	6.2849D 00	1.2352D 00	2.1125D-01
6.2	1.4547D-03	1.0528D 00	1.8245D 00	6.5330D 00	1.2454D 00	2.1948D-01
6.4	1.1328D-03	1.0564D 00	1.8563D 00	6.7831D 00	1.2555D 00	2.2753D-01
6.6	8.8037D-04	1.0599D 00	1.8871D 00	7.0352D 00	1.2654D 00	2.3540D-01
6.8	6.8285D-04	1.0631D 00	1.9169D 00	7.2892D 00	1.2752D 00	2.4309D-01
7.0	5.2862D-04	1.0662D 00	1.9459D 00	7.5452D 00	1.2848D 00	2.5063D-01

7.2	4.0844D-04	1.0692D 00	1.9741D 00	7.8032D 00	1.2943D 00	2.5801D-01
7.4	3.1499D-04	1.0719D 00	2.0015D 00	8.0630D 00	1.3037D 00	2.6523D-01
7.6	2.4247D-04	1.0746D 00	2.0281D 00	8.3246D 00	1.3130D 00	2.7231D-01
7.8	1.8630D-04	1.0771D 00	2.0541D 00	8.5882D 00	1.3221D 00	2.7926D-01
8.0	1.4288D-04	1.0795D 00	2.0794D 00	8.8535D 00	1.3312D 00	2.8607D-01
8.2	1.0939D-04	1.0817D 00	2.1041D 00	9.1206D 00	1.3401D 00	2.9275D-01
8.4	8.3595D-05	1.0839D 00	2.1282D 00	9.3895D 00	1.3489D 00	2.9930D-01
8.6	6.3773D-05	1.0859D 00	2.1518D 00	9.6602D 00	1.3576D 00	3.0574D-01
8.8	4.8567D-05	1.0879D 00	2.1748D 00	9.9326D 00	1.3662D 00	3.1206D-01
9.0	3.6923D-05	1.0898D 00	2.1972D 00	1.0207D 01	1.3747D 00	3.1826D-01
9.2	2.8024D-05	1.0916D 00	2.2192D 00	1.0482D 01	1.3831D 00	3.2436D-01
9.4	2.1234D-05	1.0933D 00	2.2407D 00	1.0760D 01	1.3915D 00	3.3036D-01
9.6	1.6062D-05	1.0950D 00	2.2618D 00	1.1039D 01	1.3997D 00	3.3625D-01
9.8	1.2130D-05	1.0965D 00	2.2824D 00	1.1320D 01	1.4078D 00	3.4205D-01
10.0	9.1463D-06	1.0981D 00	2.3026D 00	1.1602D 01	1.4159D 00	3.4775D-01
10.2	6.8852D-06	1.0995D 00	2.3224D 00	1.1886D 01	1.4238D 00	3.5336D-01
10.4	5.1749D-06	1.1009D 00	2.3418D 00	1.2172D 01	1.4317D 00	3.5888D-01
10.6	3.8833D-06	1.1023D 00	2.3609D 00	1.2459D 01	1.4395D 00	3.6432D-01
10.8	2.9096D-06	1.1035D 00	2.3795D 00	1.2748D 01	1.4473D 00	3.6967D-01
11.0	2.1767D-06	1.1048D 00	2.3979D 00	1.3038D 01	1.4549D 00	3.7494D-01
11.2	1.6259D-06	1.1060D 00	2.4159D 00	1.3329D 01	1.4625D 00	3.8013D-01
11.4	1.2126D-06	1.1072D 00	2.4336D 00	1.3623D 01	1.4700D 00	3.8525D-01
11.6	9.0309D-07	1.1083D 00	2.4510D 00	1.3917D 01	1.4774D 00	3.9029D-01
11.8	6.7156D-07	1.1093D 00	2.4681D 00	1.4214D 01	1.4848D 00	3.9525D-01
12.0	4.9866D-07	1.1104D 00	2.4849D 00	1.4511D 01	1.4921D 00	4.0015D-01
12.2	3.6973D-07	1.1114D 00	2.5014D 00	1.4810D 01	1.4993D 00	4.0498D-01
12.4	2.7375D-07	1.1124D 00	2.5177D 00	1.5111D 01	1.5064D 00	4.0975D-01
12.6	2.0239D-07	1.1133D 00	2.5337D 00	1.5413D 01	1.5135D 00	4.1445D-01
12.8	1.4943D-07	1.1142D 00	2.5494D 00	1.5716D 01	1.5206D 00	4.1908D-01
13.0	1.1017D-07	1.1151D 00	2.5649D 00	1.6021D 01	1.5275D 00	4.2366D-01
13.2	8.1109D-08	1.1159D 00	2.5802D 00	1.6327D 01	1.5344D 00	4.2817D-01
13.4	5.9634D-08	1.1167D 00	2.5953D 00	1.6635D 01	1.5413D 00	4.3263D-01
13.6	4.3784D-08	1.1175D 00	2.6101D 00	1.6944D 01	1.5481D 00	4.3703D-01
13.8	3.2104D-08	1.1183D 00	2.6247D 00	1.7254D 01	1.5548D 00	4.4137D-01
14.0	2.3508D-08	1.1191D 00	2.6391D 00	1.7566D 01	1.5615D 00	4.4566D-01
14.2	1.7191D-08	1.1198D 00	2.6532D 00	1.7879D 01	1.5681D 00	4.4990D-01
14.4	1.2555D-08	1.1205D 00	2.6672D 00	1.8193D 01	1.5747D 00	4.5408D-01
14.6	9.1568D-09	1.1212D 00	2.6810D 00	1.8509D 01	1.5813D 00	4.5822D-01
14.8	6.6698D-09	1.1218D 00	2.6946D 00	1.8826D 01	1.5877D 00	4.6230D-01
15.0	4.8521D-09	1.1225D 00	2.7081D 00	1.9144D 01	1.5942D 00	4.6634D-01

TABLE 3
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β = 10.0

G	C	A	LOG(G)	Φ	Φ'	LOG(Φ')
0.0	1.0000D 00	0.0		0.0	6.4153D-01	-4.4390D-01
0.2	8.7268D-01	3.1116D-01	-1.6094D 00	1.3619D-01	7.1841D-01	-3.3071D-01
0.4	7.5094D-01	4.5860D-01	-9.1629D-01	2.8642D-01	7.8132D-01	-2.4677D-01
0.6	6.3911D-01	5.6138D-01	-5.1083D-01	4.4768D-01	8.2877D-01	-1.8781D-01
0.8	5.3953D-01	6.3818D-01	-2.2314D-01	6.1705D-01	8.6306D-01	-1.4727D-01
1.0	4.5280D-01	6.9801D-01	0.0	7.9231D-01	8.8836D-01	-1.1838D-01
1.2	3.7830D-01	7.4614D-01	1.8232D-01	9.7206D-01	9.0859D-01	-9.5864D-02
1.4	3.1488D-01	7.8587D-01	3.3647D-01	1.1556D 00	9.2633D-01	-7.6519D-02
1.6	2.6119D-01	8.1930D-01	4.7000D-01	1.3425D 00	9.4291D-01	-5.8783D-02
1.8	2.1595D-01	8.4785D-01	5.8779D-01	1.5327D 00	9.5885D-01	-4.2024D-02
2.0	1.7799D-01	8.7252D-01	6.9315D-01	1.7260D 00	9.7432D-01	-2.6011D-02
2.2	1.4625D-01	8.9403D-01	7.8846D-01	1.9224D 00	9.8941D-01	-1.0650D-02
2.4	1.1982D-01	9.1295D-01	8.7547D-01	2.1218D 00	1.0041D 00	4.1155D-03
2.6	9.7878D-02	9.2970D-01	9.5551D-01	2.3240D 00	1.0185D 00	1.8328D-02
2.8	7.9728D-02	9.4463D-01	1.0296D 00	2.5291D 00	1.0325D 00	3.2025D-02
3.0	6.4763D-02	9.5800D-01	1.0986D 00	2.7370D 00	1.0463D 00	4.5241D-02
3.2	5.2464D-02	9.7004D-01	1.1632D 00	2.9476D 00	1.0597D 00	5.8007D-02
3.4	4.2388D-02	9.8094D-01	1.2238D 00	3.1609D 00	1.0729D 00	7.0350D-02
3.6	3.4158D-02	9.9083D-01	1.2809D 00	3.3768D 00	1.0858D 00	8.2298D-02
3.8	2.7455D-02	9.9986D-01	1.3350D 00	3.5952D 00	1.0984D 00	9.3872D-02
4.0	2.2013D-02	1.0081D 00	1.3863D 00	3.8161D 00	1.1108D 00	1.0510D-01
4.2	1.7606D-02	1.0157D 00	1.4351D 00	4.0395D 00	1.1230D 00	1.1599D-01
4.4	1.4048D-02	1.0227D 00	1.4816D 00	4.2653D 00	1.1349D 00	1.2656D-01
4.6	1.1182D-02	1.0291D 00	1.5261D 00	4.4935D 00	1.1467D 00	1.3685D-01
4.8	8.8801D-03	1.0350D 00	1.5686D 00	4.7239D 00	1.1582D 00	1.4685D-01
5.0	7.0360D-03	1.0406D 00	1.6094D 00	4.9567D 00	1.1695D 00	1.5658D-01
5.2	5.5624D-03	1.0457D 00	1.6487D 00	5.1917D 00	1.1806D 00	1.6606D-01
5.4	4.3877D-03	1.0505D 00	1.6864D 00	5.4290D 00	1.1916D 00	1.7530D-01
5.6	3.4535D-03	1.0550D 00	1.7228D 00	5.6684D 00	1.2024D 00	1.8430D-01
5.8	2.7125D-03	1.0591D 00	1.7579D 00	5.9099D 00	1.2130D 00	1.9309D-01
6.0	2.1259D-03	1.0630D 00	1.7918D 00	6.1535D 00	1.2234D 00	2.0167D-01
6.2	1.6628D-03	1.0667D 00	1.8245D 00	6.3993D 00	1.2337D 00	2.1005D-01
6.4	1.2979D-03	1.0702D 00	1.8563D 00	6.6470D 00	1.2439D 00	2.1824D-01
6.6	1.0110D-03	1.0734D 00	1.8871D 00	6.8968D 00	1.2539D 00	2.2625D-01
6.8	7.8598D-04	1.0765D 00	1.9169D 00	7.1486D 00	1.2637D 00	2.3408D-01
7.0	6.0985D-04	1.0794D 00	1.9459D 00	7.4023D 00	1.2735D 00	2.4174D-01

7.2	4.7227D-04	1.0821D 00	1.9741D 00	7.6580D 00	1.2831D 00	2.4924D-01
7.4	3.6504D-04	1.0847D 00	2.0015D 00	7.9155D 00	1.2925D 00	2.5659D-01
7.6	2.8162D-04	1.0871D 00	2.0281D 00	8.1750D 00	1.3019D 00	2.6379D-01
7.8	2.1686D-04	1.0895D 00	2.0541D 00	8.4363D 00	1.3111D 00	2.7085D-01
8.0	1.6669D-04	1.0917D 00	2.0794D 00	8.6994D 00	1.3202D 00	2.7777D-01
8.2	1.2789D-04	1.0938D 00	2.1041D 00	8.9643D 00	1.3292D 00	2.8455D-01
8.4	9.7952D-05	1.0958D 00	2.1282D 00	9.2310D 00	1.3380D 00	2.9121D-01
8.6	7.4887D-05	1.0977D 00	2.1518D 00	9.4995D 00	1.3468D 00	2.9775D-01
8.8	5.7154D-05	1.0995D 00	2.1748D 00	9.7698D 00	1.3555D 00	3.0416D-01
9.0	4.3545D-05	1.1012D 00	2.1972D 00	1.0042D 01	1.3641D 00	3.1046D-01
9.2	3.3120D-05	1.1028D 00	2.2192D 00	1.0315D 01	1.3725D 00	3.1665D-01
9.4	2.5148D-05	1.1044D 00	2.2407D 00	1.0591D 01	1.3809D 00	3.2274D-01
9.6	1.9064D-05	1.1059D 00	2.2618D 00	1.0868D 01	1.3892D 00	3.2872D-01
9.8	1.4427D-05	1.1074D 00	2.2824D 00	1.1146D 01	1.3974D 00	3.3460D-01
10.0	1.0901D-05	1.1088D 00	2.3026D 00	1.1427D 01	1.4055D 00	3.4038D-01
10.2	8.2230D-06	1.1101D 00	2.3224D 00	1.1709D 01	1.4135D 00	3.4607D-01
10.4	6.1931D-06	1.1114D 00	2.3418D 00	1.1992D 01	1.4214D 00	3.5167D-01
10.6	4.6570D-06	1.1126D 00	2.3609D 00	1.2277D 01	1.4293D 00	3.5718D-01
10.8	3.4964D-06	1.1138D 00	2.3795D 00	1.2564D 01	1.4371D 00	3.6261D-01
11.0	2.6209D-06	1.1149D 00	2.3979D 00	1.2852D 01	1.4448D 00	3.6795D-01
11.2	1.9617D-06	1.1160D 00	2.4159D 00	1.3142D 01	1.4524D 00	3.7321D-01
11.4	1.4661D-06	1.1170D 00	2.4336D 00	1.3433D 01	1.4599D 00	3.7840D-01
11.6	1.0940D-06	1.1180D 00	2.4510D 00	1.3726D 01	1.4674D 00	3.8350D-01
11.8	8.1515D-07	1.1190D 00	2.4681D 00	1.4020D 01	1.4748D 00	3.8854D-01
12.0	6.0648D-07	1.1199D 00	2.4849D 00	1.4316D 01	1.4822D 00	3.9350D-01
12.2	4.5057D-07	1.1208D 00	2.5014D 00	1.4613D 01	1.4894D 00	3.9839D-01
12.4	3.3426D-07	1.1217D 00	2.5177D 00	1.4911D 01	1.4966D 00	4.0322D-01
12.6	2.4761D-07	1.1225D 00	2.5337D 00	1.5211D 01	1.5038D 00	4.0797D-01
12.8	1.8317D-07	1.1233D 00	2.5494D 00	1.5513D 01	1.5108D 00	4.1267D-01
13.0	1.3531D-07	1.1241D 00	2.5649D 00	1.5816D 01	1.5179D 00	4.1730D-01
13.2	9.9810D-08	1.1249D 00	2.5802D 00	1.6120D 01	1.5248D 00	4.2187D-01
13.4	7.3524D-08	1.1256D 00	2.5953D 00	1.6426D 01	1.5317D 00	4.2638D-01
13.6	5.4087D-08	1.1263D 00	2.6101D 00	1.6733D 01	1.5385D 00	4.3083D-01
13.8	3.9734D-08	1.1270D 00	2.6247D 00	1.7041D 01	1.5453D 00	4.3523D-01
14.0	2.9150D-08	1.1277D 00	2.6391D 00	1.7351D 01	1.5520D 00	4.3957D-01
14.2	2.1357D-08	1.1283D 00	2.6532D 00	1.7662D 01	1.5587D 00	4.4386D-01
14.4	1.5627D-08	1.1289D 00	2.6672D 00	1.7974D 01	1.5653D 00	4.4809D-01
14.6	1.1419D-08	1.1295D 00	2.6810D 00	1.8288D 01	1.5719D 00	4.5228D-01
14.8	8.3331D-09	1.1301D 00	2.6946D 00	1.8603D 01	1.5784D 00	4.5641D-01
15.0	6.0733D-09	1.1307D 00	2.7081D 00	1.8919D 01	1.5849D 00	4.6050D-01

TABLE 4
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR $\beta =$ 5.0

G	C	A	LOG(G)	Φ	Φ'	LOG(Φ')
0.0	1.0000D 00	0.0		0.0	5.8368D-01	-5.3840D-01
0.2	8.8387D-01	3.1090D-01	-1.6094D 00	1.2344D-01	6.5005D-01	-4.3071D-01
0.4	7.7131D-01	4.6100D-01	-9.1629D-01	2.5966D-01	7.1108D-01	-3.4097D-01
0.6	6.6539D-01	5.6819D-01	-5.1083D-01	4.0738D-01	7.6476D-01	-2.6820D-01
0.8	5.6836D-01	6.4967D-01	-2.2314D-01	5.6501D-01	8.1011D-01	-2.1059D-01
1.0	4.8149D-01	7.1335D-01	0.0	7.3088D-01	8.4733D-01	-1.6567D-01
1.2	4.0516D-01	7.6410D-01	1.8232D-01	9.0347D-01	8.7749D-01	-1.3069D-01
1.4	3.3908D-01	8.0529D-01	3.3647D-01	1.0815D 00	9.0216D-01	-1.0296D-01
1.6	2.8250D-01	8.3933D-01	4.7000D-01	1.2641D 00	9.2294D-01	-8.0191D-02
1.8	2.3445D-01	8.6798D-01	5.8779D-01	1.4505D 00	9.4118D-01	-6.0624D-02
2.0	1.9389D-01	8.9245D-01	6.9315D-01	1.6404D 00	9.5784D-01	-4.3075D-02
2.2	1.5984D-01	9.1363D-01	7.8846D-01	1.8336D 00	9.7353D-01	-2.6825D-02
2.4	1.3136D-01	9.3215D-01	8.7547D-01	2.0298D 00	9.8859D-01	-1.1472D-02
2.6	1.0764D-01	9.4848D-01	9.5551D-01	2.2290D 00	1.0032D 00	3.1941D-03
2.8	8.7943D-02	9.6297D-01	1.0296D 00	2.4311D 00	1.0174D 00	1.7283D-02
3.0	7.1651D-02	9.7592D-01	1.0986D 00	2.6359D 00	1.0313D 00	3.0856D-02
3.2	5.8217D-02	9.8754D-01	1.1632D 00	2.8436D 00	1.0449D 00	4.3957D-02
3.4	4.7174D-02	9.9802D-01	1.2238D 00	3.0539D 00	1.0583D 00	5.6617D-02
3.6	3.8126D-02	1.0075D 00	1.2809D 00	3.2669D 00	1.0713D 00	6.8864D-02
3.8	3.0734D-02	1.0161D 00	1.3350D 00	3.4824D 00	1.0841D 00	8.0724D-02
4.0	2.4712D-02	1.0240D 00	1.3863D 00	3.7005D 00	1.0966D 00	9.2218D-02
4.2	1.9821D-02	1.0312D 00	1.4351D 00	3.9210D 00	1.1089D 00	1.0337D-01
4.4	1.5859D-02	1.0378D 00	1.4816D 00	4.1440D 00	1.1210D 00	1.1419D-01
4.6	1.2659D-02	1.0439D 00	1.5261D 00	4.3694D 00	1.1328D 00	1.2471D-01
4.8	1.0081D-02	1.0495D 00	1.5686D 00	4.5971D 00	1.1445D 00	1.3493D-01
5.0	8.0092D-03	1.0547D 00	1.6094D 00	4.8272D 00	1.1559D 00	1.4488D-01
5.2	6.3489D-03	1.0595D 00	1.6487D 00	5.0595D 00	1.1672D 00	1.5457D-01
5.4	5.0215D-03	1.0640D 00	1.6864D 00	5.2940D 00	1.1782D 00	1.6400D-01
5.6	3.9630D-03	1.0682D 00	1.7228D 00	5.5308D 00	1.1891D 00	1.7320D-01
5.8	3.1209D-03	1.0721D 00	1.7579D 00	5.7696D 00	1.1998D 00	1.8217D-01
6.0	2.4524D-03	1.0757D 00	1.7918D 00	6.0107D 00	1.2104D 00	1.9093D-01
6.2	1.9232D-03	1.0791D 00	1.8245D 00	6.2538D 00	1.2208D 00	1.9948D-01
6.4	1.5050D-03	1.0823D 00	1.8563D 00	6.4990D 00	1.2310D 00	2.0783D-01
6.6	1.1754D-03	1.0853D 00	1.8871D 00	6.7462D 00	1.2411D 00	2.1599D-01
6.8	9.1609D-04	1.0881D 00	1.9169D 00	6.9954D 00	1.2510D 00	2.2397D-01
7.0	7.1261D-04	1.0908D 00	1.9459D 00	7.2466D 00	1.2608D 00	2.3178D-01

7.2	5.5324D-04	1.0933D 00	1.9741D 00	7.4997D 00	1.2705D 00	2.3943D-01
7.4	4.2869D-04	1.0956D 00	2.0015D 00	7.7548D 00	1.2801D 00	2.4691D-01
7.6	3.3155D-04	1.0979D 00	2.0281D 00	8.0117D 00	1.2895D 00	2.5424D-01
7.8	2.5594D-04	1.1000D 00	2.0541D 00	8.2706D 00	1.2988D 00	2.6142D-01
8.0	1.9721D-04	1.1020D 00	2.0794D 00	8.5312D 00	1.3080D 00	2.6847D-01
8.2	1.5168D-04	1.1039D 00	2.1041D 00	8.7937D 00	1.3170D 00	2.7537D-01
8.4	1.1645D-04	1.1057D 00	2.1282D 00	9.0580D 00	1.3260D 00	2.8215D-01
8.6	8.9245D-05	1.1074D 00	2.1518D 00	9.3241D 00	1.3348D 00	2.8879D-01
8.8	6.8275D-05	1.1090D 00	2.1748D 00	9.5920D 00	1.3436D 00	2.9532D-01
9.0	5.2142D-05	1.1106D 00	2.1972D 00	9.8615D 00	1.3522D 00	3.0173D-01
9.2	3.9753D-05	1.1120D 00	2.2192D 00	1.0133D 01	1.3607D 00	3.0802D-01
9.4	3.0256D-05	1.1134D 00	2.2407D 00	1.0406D 01	1.3692D 00	3.1421D-01
9.6	2.2989D-05	1.1148D 00	2.2618D 00	1.0680D 01	1.3775D 00	3.2029D-01
9.8	1.7439D-05	1.1161D 00	2.2824D 00	1.0957D 01	1.3858D 00	3.2626D-01
10.0	1.3206D-05	1.1173D 00	2.3026D 00	1.1235D 01	1.3939D 00	3.3214D-01
10.2	9.9853D-06	1.1185D 00	2.3224D 00	1.1514D 01	1.4020D 00	3.3792D-01
10.4	7.5376D-06	1.1196D 00	2.3418D 00	1.1796D 01	1.4100D 00	3.4360D-01
10.6	5.6809D-06	1.1207D 00	2.3609D 00	1.2078D 01	1.4179D 00	3.4920D-01
10.8	4.2748D-06	1.1217D 00	2.3795D 00	1.2363D 01	1.4258D 00	3.5471D-01
11.0	3.2117D-06	1.1227D 00	2.3979D 00	1.2649D 01	1.4335D 00	3.6013D-01
11.2	2.4093D-06	1.1236D 00	2.4159D 00	1.2936D 01	1.4412D 00	3.6547D-01
11.4	1.8046D-06	1.1246D 00	2.4336D 00	1.3225D 01	1.4488D 00	3.7073D-01
11.6	1.3496D-06	1.1254D 00	2.4510D 00	1.3516D 01	1.4563D 00	3.7592D-01
11.8	1.0078D-06	1.1263D 00	2.4681D 00	1.3808D 01	1.4638D 00	3.8102D-01
12.0	7.5150D-07	1.1271D 00	2.4849D 00	1.4101D 01	1.4712D 00	3.8606D-01
12.2	5.5953D-07	1.1279D 00	2.5014D 00	1.4396D 01	1.4785D 00	3.9102D-01
12.4	4.1600D-07	1.1286D 00	2.5177D 00	1.4693D 01	1.4857D 00	3.9591D-01
12.6	3.0884D-07	1.1293D 00	2.5337D 00	1.4990D 01	1.4929D 00	4.0074D-01
12.8	2.2895D-07	1.1300D 00	2.5494D 00	1.5290D 01	1.5000D 00	4.0550D-01
13.0	1.6949D-07	1.1307D 00	2.5649D 00	1.5590D 01	1.5071D 00	4.1019D-01
13.2	1.2530D-07	1.1314D 00	2.5802D 00	1.5893D 01	1.5141D 00	4.1483D-01
13.4	9.2495D-08	1.1320D 00	2.5953D 00	1.6196D 01	1.5210D 00	4.1940D-01
13.6	6.8187D-08	1.1326D 00	2.6101D 00	1.6501D 01	1.5279D 00	4.2391D-01
13.8	5.0199D-08	1.1332D 00	2.6247D 00	1.6807D 01	1.5347D 00	4.2837D-01
14.0	3.6906D-08	1.1337D 00	2.6391D 00	1.7115D 01	1.5415D 00	4.3277D-01
14.2	2.7096D-08	1.1343D 00	2.6532D 00	1.7424D 01	1.5482D 00	4.3711D-01
14.4	1.9867D-08	1.1348D 00	2.6672D 00	1.7734D 01	1.5549D 00	4.4140D-01
14.6	1.4548D-08	1.1353D 00	2.6810D 00	1.8046D 01	1.5615D 00	4.4564D-01
14.8	1.0639D-08	1.1358D 00	2.6946D 00	1.8359D 01	1.5680D 00	4.4983D-01
15.0	7.7697D-09	1.1363D 00	2.7081D 00	1.8673D 01	1.5745D 00	4.5396D-01

TABLE 5
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β = 2.0

G	C	A	LOG(G)	Φ	Φ'	LOG(Φ')
0.0	1.0000D 00	0.0		0.0	4.8939D-01	-7.1460D-01
0.2	9.0242D-01	3.0476D-01	-1.6094D 00	1.0267D-01	5.3736D-01	-6.2108D-01
0.4	8.0660D-01	4.5192D-01	-9.1629D-01	2.1492D-01	5.8498D-01	-5.3617D-01
0.6	7.1420D-01	5.6035D-01	-5.1083D-01	3.3659D-01	6.3150D-01	-4.5965D-01
0.8	6.2663D-01	6.4644D-01	-2.2314D-01	4.6740D-01	6.7623D-01	-3.9122D-01
1.0	5.4502D-01	7.1685D-01	0.0	6.0693D-01	7.1858D-01	-3.3048D-01
1.2	4.7018D-01	7.7517D-01	1.8232D-01	7.5465D-01	7.5809D-01	-2.7695D-01
1.4	4.0254D-01	8.2366D-01	3.3647D-01	9.0995D-01	7.9446D-01	-2.3009D-01
1.6	3.4225D-01	8.6403D-01	4.7000D-01	1.0722D 00	8.2756D-01	-1.8928D-01
1.8	2.8916D-01	8.9763D-01	5.8779D-01	1.2408D 00	8.5741D-01	-1.5384D-01
2.0	2.4293D-01	9.2561D-01	6.9315D-01	1.4150D 00	8.8417D-01	-1.2310D-01
2.2	2.0306D-01	9.4898D-01	7.8846D-01	1.5942D 00	9.0815D-01	-9.6351D-02
2.4	1.6897D-01	9.6858D-01	8.7547D-01	1.7781D 00	9.2967D-01	-7.2923D-02
2.6	1.4002D-01	9.8512D-01	9.5551D-01	1.9660D 00	9.4914D-01	-5.2202D-02
2.8	1.1560D-01	9.9922D-01	1.0296D 00	2.1576D 00	9.6692D-01	-3.3640D-02
3.0	9.5116D-02	1.0113D 00	1.0986D 00	2.3527D 00	9.8336D-01	-1.6777D-02
3.2	7.8013D-02	1.0219D 00	1.1632D 00	2.5509D 00	9.9876D-01	-1.2363D-03
3.4	6.3793D-02	1.0311D 00	1.2238D 00	2.7521D 00	1.0134D 00	1.3273D-02
3.6	5.2017D-02	1.0393D 00	1.2809D 00	2.9562D 00	1.0273D 00	2.6970D-02
3.8	4.2298D-02	1.0465D 00	1.3350D 00	3.1630D 00	1.0408D 00	4.0014D-02
4.0	3.4304D-02	1.0531D 00	1.3863D 00	3.3725D 00	1.0539D 00	5.2519D-02
4.2	2.7749D-02	1.0590D 00	1.4351D 00	3.5846D 00	1.0667D 00	6.4562D-02
4.4	2.2390D-02	1.0643D 00	1.4816D 00	3.7991D 00	1.0792D 00	7.6201D-02
4.6	1.8021D-02	1.0691D 00	1.5261D 00	4.0162D 00	1.0914D 00	8.7475D-02
4.8	1.4470D-02	1.0736D 00	1.5686D 00	4.2357D 00	1.1034D 00	9.8412D-02
5.0	1.1591D-02	1.0776D 00	1.6094D 00	4.4576D 00	1.1152D 00	1.0904D-01
5.2	9.2626D-03	1.0813D 00	1.6487D 00	4.6818D 00	1.1268D 00	1.1937D-01
5.4	7.3853D-03	1.0848D 00	1.6864D 00	4.9083D 00	1.1382D 00	1.2942D-01
5.6	5.8752D-03	1.0879D 00	1.7228D 00	5.1370D 00	1.1494D 00	1.3921D-01
5.8	4.6635D-03	1.0908D 00	1.7579D 00	5.3680D 00	1.1604D 00	1.4875D-01
6.0	3.6936D-03	1.0935D 00	1.7918D 00	5.6012D 00	1.1712D 00	1.5805D-01
6.2	2.9191D-03	1.0960D 00	1.8245D 00	5.8365D 00	1.1819D 00	1.6713D-01
6.4	2.3021D-03	1.0983D 00	1.8563D 00	6.0739D 00	1.1924D 00	1.7599D-01
6.6	1.8118D-03	1.1004D 00	1.8871D 00	6.3134D 00	1.2028D 00	1.8464D-01
6.8	1.4230D-03	1.1024D 00	1.9169D 00	6.5550D 00	1.2130D 00	1.9309D-01
7.0	1.1153D-03	1.1043D 00	1.9459D 00	6.7986D 00	1.2231D 00	2.0135D-01

7.2	8.7243D-04	1.1060D 00	1.9741D 00	7.0442D 00	1.2330D 00	2.0943D-01
7.4	6.8110D-04	1.1076D 00	2.0015D 00	7.2918D 00	1.2428D 00	2.1734D-01
7.6	5.3069D-04	1.1091D 00	2.0281D 00	7.5413D 00	1.2524D 00	2.2508D-01
7.8	4.1271D-04	1.1105D 00	2.0541D 00	7.7928D 00	1.2620D 00	2.3266D-01
8.0	3.2035D-04	1.1118D 00	2.0794D 00	8.0461D 00	1.2714D 00	2.4009D-01
8.2	2.4819D-04	1.1131D 00	2.1041D 00	8.3013D 00	1.2806D 00	2.4736D-01
8.4	1.9194D-04	1.1142D 00	2.1282D 00	8.5583D 00	1.2898D 00	2.5450D-01
8.6	1.4816D-04	1.1153D 00	2.1518D 00	8.8172D 00	1.2989D 00	2.6149D-01
8.8	1.1416D-04	1.1164D 00	2.1748D 00	9.0779D 00	1.3078D 00	2.6836D-01
9.0	8.7810D-05	1.1173D 00	2.1972D 00	9.3403D 00	1.3167D 00	2.7510D-01
9.2	6.7422D-05	1.1182D 00	2.2192D 00	9.6045D 00	1.3254D 00	2.8171D-01
9.4	5.1677D-05	1.1191D 00	2.2407D 00	9.8705D 00	1.3340D 00	2.8820D-01
9.6	3.9542D-05	1.1199D 00	2.2618D 00	1.0138D 01	1.3426D 00	2.9458D-01
9.8	3.0205D-05	1.1207D 00	2.2824D 00	1.0408D 01	1.3510D 00	3.0085D-01
10.0	2.3034D-05	1.1214D 00	2.3026D 00	1.0679D 01	1.3594D 00	3.0701D-01
10.2	1.7536D-05	1.1221D 00	2.3224D 00	1.0951D 01	1.3676D 00	3.1307D-01
10.4	1.3329D-05	1.1227D 00	2.3418D 00	1.1226D 01	1.3758D 00	3.1903D-01
10.6	1.0114D-05	1.1233D 00	2.3609D 00	1.1502D 01	1.3839D 00	3.2489D-01
10.8	7.6628D-06	1.1239D 00	2.3795D 00	1.1779D 01	1.3919D 00	3.3065D-01
11.0	5.7962D-06	1.1244D 00	2.3979D 00	1.2058D 01	1.3998D 00	3.3633D-01
11.2	4.3774D-06	1.1249D 00	2.4159D 00	1.2339D 01	1.4076D 00	3.4191D-01
11.4	3.3008D-06	1.1254D 00	2.4336D 00	1.2621D 01	1.4154D 00	3.4741D-01
11.6	2.4851D-06	1.1259D 00	2.4510D 00	1.2905D 01	1.4231D 00	3.5282D-01
11.8	1.8681D-06	1.1263D 00	2.4681D 00	1.3191D 01	1.4307D 00	3.5816D-01
12.0	1.4022D-06	1.1268D 00	2.4849D 00	1.3477D 01	1.4382D 00	3.6341D-01
12.2	1.0509D-06	1.1271D 00	2.5014D 00	1.3766D 01	1.4457D 00	3.6859D-01
12.4	7.8644D-07	1.1275D 00	2.5177D 00	1.4056D 01	1.4531D 00	3.7370D-01
12.6	5.8767D-07	1.1279D 00	2.5337D 00	1.4347D 01	1.4604D 00	3.7873D-01
12.8	4.3850D-07	1.1282D 00	2.5494D 00	1.4640D 01	1.4677D 00	3.8369D-01
13.0	3.2672D-07	1.1285D 00	2.5649D 00	1.4934D 01	1.4749D 00	3.8858D-01
13.2	2.4308D-07	1.1288D 00	2.5802D 00	1.5230D 01	1.4820D 00	3.9341D-01
13.4	1.8060D-07	1.1291D 00	2.5953D 00	1.5527D 01	1.4891D 00	3.9817D-01
13.6	1.3399D-07	1.1294D 00	2.6101D 00	1.5826D 01	1.4961D 00	4.0287D-01
13.8	9.9270D-08	1.1297D 00	2.6247D 00	1.6125D 01	1.5031D 00	4.0751D-01
14.0	7.3445D-08	1.1299D 00	2.6391D 00	1.6427D 01	1.5100D 00	4.1208D-01
14.2	5.4264D-08	1.1301D 00	2.6532D 00	1.6729D 01	1.5168D 00	4.1660D-01
14.4	4.0038D-08	1.1304D 00	2.6672D 00	1.7033D 01	1.5236D 00	4.2106D-01
14.6	2.9501D-08	1.1306D 00	2.6810D 00	1.7339D 01	1.5303D 00	4.2547D-01
14.8	2.1709D-08	1.1308D 00	2.6946D 00	1.7646D 01	1.5370D 00	4.2982D-01
15.0	1.5953D-08	1.1310D 00	2.7081D 00	1.7954D 01	1.5436D 00	4.3411D-01

TABLE 6
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β = 1.0

G	C	A	LOG(G)	ϕ	ϕ'	LOG(ϕ')
0.0	1.0000D 00	0.0		0.0	4.0880D-01	-8.9453D-01
0.2	9.1840D-01	2.8981D-01	-1.6094D 00	8.5124D-02	4.4254D-01	-8.1522D-01
0.4	8.3774D-01	4.2143D-01	-9.1629D-01	1.7705D-01	4.7678D-01	-7.4071D-01
0.6	7.5892D-01	5.1705D-01	-5.1083D-01	2.7585D-01	5.1128D-01	-6.7083D-01
0.8	6.8279D-01	5.9366D-01	-2.2314D-01	3.8156D-01	5.4583D-01	-6.0545D-01
1.0	6.1008D-01	6.5800D-01	0.0	4.9417D-01	5.8019D-01	-5.4440D-01
1.2	5.4139D-01	7.1340D-01	1.8232D-01	6.1361D-01	6.1414D-01	-4.8753D-01
1.4	4.7722D-01	7.6174D-01	3.3647D-01	7.3979D-01	6.4749D-01	-4.3465D-01
1.6	4.1788D-01	8.0418D-01	4.7000D-01	8.7255D-01	6.8003D-01	-3.8562D-01
1.8	3.6359D-01	8.4148D-01	5.8779D-01	1.0117D 00	7.1159D-01	-3.4026D-01
2.0	3.1439D-01	8.7422D-01	6.9315D-01	1.1571D 00	7.4202D-01	-2.9838D-01
2.2	2.7024D-01	9.0282D-01	7.8846D-01	1.3085D 00	7.7120D-01	-2.5981D-01
2.4	2.3096D-01	9.2769D-01	8.7547D-01	1.4655D 00	7.9904D-01	-2.2435D-01
2.6	1.9633D-01	9.4916D-01	9.5551D-01	1.6280D 00	8.2546D-01	-1.9181D-01
2.8	1.6603D-01	9.6758D-01	1.0296D 00	1.7956D 00	8.5045D-01	-1.6199D-01
3.0	1.3973D-01	9.8327D-01	1.0986D 00	1.9681D 00	8.7400D-01	-1.3468D-01
3.2	1.1706D-01	9.9653D-01	1.1632D 00	2.1451D 00	8.9613D-01	-1.0967D-01
3.4	9.7644D-02	1.0077D 00	1.2238D 00	2.3264D 00	9.1691D-01	-8.6749D-02
3.6	8.1124D-02	1.0170D 00	1.2809D 00	2.5118D 00	9.3640D-01	-6.5713D-02
3.8	6.7145D-02	1.0247D 00	1.3350D 00	2.7009D 00	9.5470D-01	-4.6359D-02
4.0	5.5377D-02	1.0311D 00	1.3863D 00	2.8936D 00	9.7191D-01	-2.8491D-02
4.2	4.5520D-02	1.0363D 00	1.4351D 00	3.0896D 00	9.8814D-01	-1.1928D-02
4.4	3.7299D-02	1.0407D 00	1.4816D 00	3.2888D 00	1.0035D 00	3.4994D-03
4.6	3.0472D-02	1.0442D 00	1.5261D 00	3.4910D 00	1.0181D 00	1.7943D-02
4.8	2.4823D-02	1.0472D 00	1.5686D 00	3.6960D 00	1.0320D 00	3.1539D-02
5.0	2.0166D-02	1.0496D 00	1.6094D 00	3.9037D 00	1.0454D 00	4.4407D-02
5.2	1.6340D-02	1.0516D 00	1.6487D 00	4.1141D 00	1.0583D 00	5.6647D-02
5.4	1.3207D-02	1.0532D 00	1.6864D 00	4.3270D 00	1.0707D 00	6.8347D-02
5.6	1.0648D-02	1.0546D 00	1.7228D 00	4.5424D 00	1.0828D 00	7.9577D-02
5.8	8.5645D-03	1.0557D 00	1.7579D 00	4.7601D 00	1.0946D 00	9.0396D-02
6.0	6.8726D-03	1.0567D 00	1.7918D 00	4.9802D 00	1.1061D 00	1.0085D-01
6.2	5.5025D-03	1.0575D 00	1.8245D 00	5.2026D 00	1.1174D 00	1.1098D-01
6.4	4.3956D-03	1.0581D 00	1.8563D 00	5.4271D 00	1.1284D 00	1.2082D-01
6.6	3.5038D-03	1.0587D 00	1.8871D 00	5.6539D 00	1.1393D 00	1.3039D-01
6.8	2.7869D-03	1.0592D 00	1.9169D 00	5.8828D 00	1.1499D 00	1.3971D-01
7.0	2.2119D-03	1.0595D 00	1.9459D 00	6.1139D 00	1.1604D 00	1.4880D-01

7.2	1.7520D-03	1.0598D 00	1.9741D 00	6.3470D 00	1.1708D 00	1.5767D-01
7.4	1.3848D-03	1.0601D 00	2.0015D 00	6.5822D 00	1.1810D 00	1.6634D-01
7.6	1.0924D-03	1.0602D 00	2.0281D 00	6.8194D 00	1.1910D 00	1.7481D-01
7.8	8.6000D-04	1.0603D 00	2.0541D 00	7.0586D 00	1.2009D 00	1.8309D-01
8.0	6.7571D-04	1.0604D 00	2.0794D 00	7.2997D 00	1.2107D 00	1.9120D-01
8.2	5.2988D-04	1.0605D 00	2.1041D 00	7.5429D 00	1.2203D 00	1.9913D-01
8.4	4.1473D-04	1.0605D 00	2.1282D 00	7.7879D 00	1.2299D 00	2.0690D-01
8.6	3.2399D-04	1.0604D 00	2.1518D 00	8.0348D 00	1.2393D 00	2.1452D-01
8.8	2.5263D-04	1.0604D 00	2.1748D 00	8.2836D 00	1.2485D 00	2.2198D-01
9.0	1.9663D-04	1.0603D 00	2.1972D 00	8.5342D 00	1.2577D 00	2.2930D-01
9.2	1.5276D-04	1.0602D 00	2.2192D 00	8.7867D 00	1.2668D 00	2.3647D-01
9.4	1.1846D-04	1.0601D 00	2.2407D 00	9.0409D 00	1.2757D 00	2.4351D-01
9.6	9.1705D-05	1.0599D 00	2.2618D 00	9.2969D 00	1.2846D 00	2.5043D-01
9.8	7.0866D-05	1.0597D 00	2.2824D 00	9.5547D 00	1.2933D 00	2.5721D-01
10.0	5.4667D-05	1.0596D 00	2.3026D 00	9.8143D 00	1.3020D 00	2.6387D-01
10.2	4.2098D-05	1.0594D 00	2.3224D 00	1.0076D 01	1.3105D 00	2.7042D-01
10.4	3.2364D-05	1.0592D 00	2.3418D 00	1.0338D 01	1.3190D 00	2.7685D-01
10.6	2.4839D-05	1.0589D 00	2.3609D 00	1.0603D 01	1.3273D 00	2.8318D-01
10.8	1.9032D-05	1.0587D 00	2.3795D 00	1.0869D 01	1.3356D 00	2.8939D-01
11.0	1.4559D-05	1.0585D 00	2.3979D 00	1.1137D 01	1.3438D 00	2.9551D-01
11.2	1.1118D-05	1.0582D 00	2.4159D 00	1.1407D 01	1.3519D 00	3.0152D-01
11.4	8.4776D-06	1.0580D 00	2.4336D 00	1.1678D 01	1.3599D 00	3.0744D-01
11.6	6.4536D-06	1.0577D 00	2.4510D 00	1.1951D 01	1.3679D 00	3.1326D-01
11.8	4.9051D-06	1.0575D 00	2.4681D 00	1.2225D 01	1.3757D 00	3.1899D-01
12.0	3.7223D-06	1.0572D 00	2.4849D 00	1.2501D 01	1.3835D 00	3.2463D-01
12.2	2.8204D-06	1.0569D 00	2.5014D 00	1.2779D 01	1.3912D 00	3.3019D-01
12.4	2.1337D-06	1.0566D 00	2.5177D 00	1.3058D 01	1.3989D 00	3.3567D-01
12.6	1.6118D-06	1.0564D 00	2.5337D 00	1.3338D 01	1.4064D 00	3.4106D-01
12.8	1.2157D-06	1.0561D 00	2.5494D 00	1.3620D 01	1.4139D 00	3.4638D-01
13.0	9.1554D-07	1.0558D 00	2.5649D 00	1.3904D 01	1.4214D 00	3.5162D-01
13.2	6.8849D-07	1.0555D 00	2.5802D 00	1.4189D 01	1.4287D 00	3.5678D-01
13.4	5.1699D-07	1.0552D 00	2.5953D 00	1.4475D 01	1.4360D 00	3.6187D-01
13.6	3.8765D-07	1.0549D 00	2.6101D 00	1.4763D 01	1.4432D 00	3.6689D-01
13.8	2.9025D-07	1.0546D 00	2.6247D 00	1.5053D 01	1.4504D 00	3.7185D-01
14.0	2.1701D-07	1.0543D 00	2.6391D 00	1.5343D 01	1.4575D 00	3.7673D-01
14.2	1.6202D-07	1.0541D 00	2.6532D 00	1.5636D 01	1.4646D 00	3.8156D-01
14.4	1.2080D-07	1.0538D 00	2.6672D 00	1.5929D 01	1.4715D 00	3.8631D-01
14.6	8.9938D-08	1.0535D 00	2.6810D 00	1.6224D 01	1.4785D 00	3.9101D-01
14.8	6.6869D-08	1.0532D 00	2.6946D 00	1.6521D 01	1.4853D 00	3.9565D-01
15.0	4.9649D-08	1.0529D 00	2.7081D 00	1.6818D 01	1.4922D 00	4.0022D-01

TABLE 7
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β = 0.5

G	C	A	LOG(G)	ϕ	ϕ'	LOG(ϕ')
0.0	1.0000D 00	0.0		0.0	3.2711D-01	-1.1175D 00
0.2	9.3466D-01	2.5750D-01	-1.6094D 00	6.7578D-02	3.4875D-01	-1.0534D 00
0.4	8.6977D-01	3.5274D-01	-9.1629D-01	1.3953D-01	3.7083D-01	-9.9201D-01
0.6	8.0579D-01	4.1395D-01	-5.1083D-01	2.1594D-01	3.9331D-01	-9.3317D-01
0.8	7.4314D-01	4.5898D-01	-2.2314D-01	2.9687D-01	4.1611D-01	-8.7680D-01
1.0	6.8222D-01	4.9479D-01	0.0	3.8240D-01	4.3920D-01	-8.2281D-01
1.2	6.2340D-01	5.2476D-01	1.8232D-01	4.7257D-01	4.6250D-01	-7.7111D-01
1.4	5.6699D-01	5.5078D-01	3.3647D-01	5.6741D-01	4.8596D-01	-7.2163D-01
1.6	5.1327D-01	5.7395D-01	4.7000D-01	6.6696D-01	5.0952D-01	-6.7428D-01
1.8	4.6245D-01	5.9493D-01	5.8779D-01	7.7122D-01	5.3314D-01	-6.2898D-01
2.0	4.1470D-01	6.1417D-01	6.9315D-01	8.8021D-01	5.5674D-01	-5.8566D-01
2.2	3.7013D-01	6.3193D-01	7.8846D-01	9.9391D-01	5.8027D-01	-5.4426D-01
2.4	3.2880D-01	6.4840D-01	8.7547D-01	1.1123D 00	6.0368D-01	-5.0470D-01
2.6	2.9073D-01	6.6369D-01	9.5551D-01	1.2354D 00	6.2693D-01	-4.6692D-01
2.8	2.5587D-01	6.7787D-01	1.0296D 00	1.3631D 00	6.4995D-01	-4.3086D-01
3.0	2.2417D-01	6.9099D-01	1.0986D 00	1.4953D 00	6.7270D-01	-3.9646D-01
3.2	1.9551D-01	7.0309D-01	1.1632D 00	1.6321D 00	6.9513D-01	-3.6365D-01
3.4	1.6976D-01	7.1418D-01	1.2238D 00	1.7734D 00	7.1721D-01	-3.3238D-01
3.6	1.4676D-01	7.2430D-01	1.2809D 00	1.9190D 00	7.3889D-01	-3.0260D-01
3.8	1.2633D-01	7.3347D-01	1.3350D 00	2.0689D 00	7.6014D-01	-2.7425D-01
4.0	1.0828D-01	7.4170D-01	1.3863D 00	2.2230D 00	7.8092D-01	-2.4728D-01
4.2	9.2437D-02	7.4903D-01	1.4351D 00	2.3812D 00	8.0121D-01	-2.2163D-01
4.4	7.8594D-02	7.5548D-01	1.4816D 00	2.5435D 00	8.2099D-01	-1.9724D-01
4.6	6.6564D-02	7.6109D-01	1.5261D 00	2.7096D 00	8.4023D-01	-1.7408D-01
4.8	5.6162D-02	7.6591D-01	1.5686D 00	2.8795D 00	8.5893D-01	-1.5207D-01
5.0	4.7211D-02	7.6998D-01	1.6094D 00	3.0531D 00	8.7707D-01	-1.3117D-01
5.2	3.9545D-02	7.7333D-01	1.6487D 00	3.2303D 00	8.9464D-01	-1.1133D-01
5.4	3.3010D-02	7.7604D-01	1.6864D 00	3.4109D 00	9.1166D-01	-9.2488D-02
5.6	2.7463D-02	7.7813D-01	1.7228D 00	3.5949D 00	9.2812D-01	-7.4595D-02
5.8	2.2774D-02	7.7968D-01	1.7579D 00	3.7822D 00	9.4403D-01	-5.7597D-02
6.0	1.8826D-02	7.8073D-01	1.7918D 00	3.9725D 00	9.5941D-01	-4.1440D-02
6.2	1.5516D-02	7.8133D-01	1.8245D 00	4.1659D 00	9.7426D-01	-2.6073D-02
6.4	1.2751D-02	7.8153D-01	1.8563D 00	4.3622D 00	9.8862D-01	-1.1444D-02
6.6	1.0448D-02	7.8139D-01	1.8871D 00	4.5613D 00	1.0025D 00	2.4981D-03
6.8	8.5387D-03	7.8095D-01	1.9169D 00	4.7632D 00	1.0159D 00	1.5801D-02
7.0	6.9595D-03	7.8025D-01	1.9459D 00	4.9676D 00	1.0289D 00	2.8512D-02

7.2	5.6579D-03	7.7933D-01	1.9741D 00	5.1747D 00	1.0415D 00	4.0676D-02
7.4	4.5884D-03	7.7823D-01	2.0015D 00	5.3842D 00	1.0537D 00	5.2337D-02
7.6	3.7121D-03	7.7699D-01	2.0281D 00	5.5962D 00	1.0656D 00	6.3534D-02
7.8	2.9961D-03	7.7562D-01	2.0541D 00	5.8104D 00	1.0771D 00	7.4305D-02
8.0	2.4127D-03	7.7416D-01	2.0794D 00	6.0270D 00	1.0884D 00	8.4687D-02
8.2	1.9386D-03	7.7263D-01	2.1041D 00	6.2458D 00	1.0993D 00	9.4710D-02
8.4	1.5543D-03	7.7104D-01	2.1282D 00	6.4667D 00	1.1100D 00	1.0440D-01
8.6	1.2436D-03	7.6942D-01	2.1518D 00	6.6898D 00	1.1205D 00	1.1380D-01
8.8	9.9287D-04	7.6778D-01	2.1748D 00	6.9149D 00	1.1308D 00	1.2291D-01
9.0	7.9111D-04	7.6613D-01	2.1972D 00	7.1421D 00	1.1409D 00	1.3178D-01
9.2	6.2909D-04	7.6448D-01	2.2192D 00	7.3712D 00	1.1507D 00	1.4040D-01
9.4	4.9927D-04	7.6283D-01	2.2407D 00	7.6024D 00	1.1605D 00	1.4881D-01
9.6	3.9548D-04	7.6120D-01	2.2618D 00	7.8354D 00	1.1700D 00	1.5701D-01
9.8	3.1267D-04	7.5959D-01	2.2824D 00	8.0704D 00	1.1794D 00	1.6503D-01
10.0	2.4674D-04	7.5799D-01	2.3026D 00	8.3072D 00	1.1887D 00	1.7287D-01
10.2	1.9435D-04	7.5642D-01	2.3224D 00	8.5458D 00	1.1979D 00	1.8054D-01
10.4	1.5281D-04	7.5488D-01	2.3418D 00	8.7863D 00	1.2069D 00	1.8805D-01
10.6	1.1993D-04	7.5336D-01	2.3609D 00	9.0286D 00	1.2158D 00	1.9542D-01
10.8	9.3961D-05	7.5187D-01	2.3795D 00	9.2726D 00	1.2246D 00	2.0264D-01
11.0	7.3485D-05	7.5041D-01	2.3979D 00	9.5184D 00	1.2333D 00	2.0973D-01
11.2	5.7372D-05	7.4898D-01	2.4159D 00	9.7660D 00	1.2420D 00	2.1669D-01
11.4	4.4715D-05	7.4758D-01	2.4336D 00	1.0015D 01	1.2505D 00	2.2352D-01
11.6	3.4791D-05	7.4620D-01	2.4510D 00	1.0266D 01	1.2589D 00	2.3023D-01
11.8	2.7025D-05	7.4485D-01	2.4681D 00	1.0519D 01	1.2672D 00	2.3684D-01
12.0	2.0957D-05	7.4353D-01	2.4849D 00	1.0773D 01	1.2755D 00	2.4333D-01
12.2	1.6225D-05	7.4223D-01	2.5014D 00	1.1029D 01	1.2837D 00	2.4971D-01
12.4	1.2541D-05	7.4097D-01	2.5177D 00	1.1286D 01	1.2917D 00	2.5599D-01
12.6	9.6782D-06	7.3972D-01	2.5337D 00	1.1546D 01	1.2997D 00	2.6217D-01
12.8	7.4569D-06	7.3850D-01	2.5494D 00	1.1806D 01	1.3077D 00	2.6825D-01
13.0	5.7363D-06	7.3730D-01	2.5649D 00	1.2069D 01	1.3155D 00	2.7424D-01
13.2	4.4058D-06	7.3613D-01	2.5802D 00	1.2333D 01	1.3233D 00	2.8013D-01
13.4	3.3787D-06	7.3498D-01	2.5953D 00	1.2598D 01	1.3310D 00	2.8594D-01
13.6	2.5871D-06	7.3385D-01	2.6101D 00	1.2865D 01	1.3387D 00	2.9166D-01
13.8	1.9779D-06	7.3275D-01	2.6247D 00	1.3133D 01	1.3462D 00	2.9730D-01
14.0	1.5099D-06	7.3166D-01	2.6391D 00	1.3403D 01	1.3537D 00	3.0286D-01
14.2	1.1509D-06	7.3059D-01	2.6532D 00	1.3675D 01	1.3612D 00	3.0834D-01
14.4	8.7598D-07	7.2955D-01	2.6672D 00	1.3948D 01	1.3685D 00	3.1374D-01
14.6	6.6574D-07	7.2852D-01	2.6810D 00	1.4222D 01	1.3758D 00	3.1906D-01
14.8	5.0523D-07	7.2751D-01	2.6946D 00	1.4498D 01	1.3831D 00	3.2431D-01
15.0	3.8286D-07	7.2652D-01	2.7081D 00	1.4776D 01	1.3903D 00	3.2950D-01

TABLE 8
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β = 0.2

G	C	A	LOG(G)	ϕ	ϕ'	LOG(ϕ')
0.0	1.0000D 00	0.0		0.0	2.2944D-01	-1.4721D 00
0.2	9.5414D-01	1.7495D-01	-1.6094D 00	4.6547D-02	2.4006D-01	-1.4269D 00
0.4	9.0843D-01	1.9304D-01	-9.1629D-01	9.6038D-02	2.5088D-01	-1.3828D 00
0.6	8.6303D-01	1.9008D-01	-5.1083D-01	1.4731D-01	2.6188D-01	-1.3399D 00
0.8	8.1808D-01	1.8111D-01	-2.2314D-01	2.0080D-01	2.7305D-01	-1.2981D 00
1.0	7.7372D-01	1.7062D-01	0.0	2.5654D-01	2.8438D-01	-1.2574D 00
1.2	7.3011D-01	1.6022D-01	1.8232D-01	3.1456D-01	2.9588D-01	-1.2178D 00
1.4	6.8736D-01	1.5049D-01	3.3647D-01	3.7490D-01	3.0752D-01	-1.1792D 00
1.6	6.4560D-01	1.4164D-01	4.7000D-01	4.3758D-01	3.1930D-01	-1.1416D 00
1.8	6.0494D-01	1.3367D-01	5.8779D-01	5.0263D-01	3.3122D-01	-1.1050D 00
2.0	5.6548D-01	1.2654D-01	6.9315D-01	5.7008D-01	3.4326D-01	-1.0693D 00
2.2	5.2732D-01	1.2017D-01	7.8846D-01	6.3994D-01	3.5541D-01	-1.0345D 00
2.4	4.9054D-01	1.1448D-01	8.7547D-01	7.1225D-01	3.6768D-01	-1.0006D 00
2.6	4.5520D-01	1.0941D-01	9.5551D-01	7.8702D-01	3.8004D-01	-9.6747D-01
2.8	4.2136D-01	1.0486D-01	1.0296D 00	8.6427D-01	3.9250D-01	-9.3522D-01
3.0	3.8906D-01	1.0079D-01	1.0986D 00	9.4402D-01	4.0505D-01	-9.0376D-01
3.2	3.5833D-01	9.7124D-02	1.1632D 00	1.0263D 00	4.1767D-01	-8.7307D-01
3.4	3.2920D-01	9.3828D-02	1.2238D 00	1.1111D 00	4.3036D-01	-8.4313D-01
3.6	3.0166D-01	9.0853D-02	1.2809D 00	1.1984D 00	4.4312D-01	-8.1392D-01
3.8	2.7573D-01	8.8163D-02	1.3350D 00	1.2883D 00	4.5593D-01	-7.8542D-01
4.0	2.5137D-01	8.5724D-02	1.3863D 00	1.3808D 00	4.6879D-01	-7.5760D-01
4.2	2.2858D-01	8.3509D-02	1.4351D 00	1.4759D 00	4.8169D-01	-7.3045D-01
4.4	2.0732D-01	8.1492D-02	1.4816D 00	1.5735D 00	4.9463D-01	-7.0394D-01
4.6	1.8755D-01	7.9652D-02	1.5261D 00	1.6737D 00	5.0760D-01	-6.7806D-01
4.8	1.6922D-01	7.7969D-02	1.5686D 00	1.7765D 00	5.2059D-01	-6.5280D-01
5.0	1.5229D-01	7.6427D-02	1.6094D 00	1.8820D 00	5.3359D-01	-6.2812D-01
5.2	1.3670D-01	7.5010D-02	1.6487D 00	1.9900D 00	5.4661D-01	-6.0403D-01
5.4	1.2238D-01	7.3706D-02	1.6864D 00	2.1006D 00	5.5962D-01	-5.8050D-01
5.6	1.0928D-01	7.2502D-02	1.7228D 00	2.2138D 00	5.7263D-01	-5.5751D-01
5.8	9.7330D-02	7.1388D-02	1.7579D 00	2.3297D 00	5.8563D-01	-5.3506D-01
6.0	8.6460D-02	7.0354D-02	1.7918D 00	2.4481D 00	5.9862D-01	-5.1313D-01
6.2	7.6605D-02	6.9393D-02	1.8245D 00	2.5691D 00	6.1158D-01	-4.9170D-01
6.4	6.7697D-02	6.8497D-02	1.8563D 00	2.6927D 00	6.2452D-01	-4.7077D-01
6.6	5.9671D-02	6.7658D-02	1.8871D 00	2.8189D 00	6.3743D-01	-4.5032D-01
6.8	5.2461D-02	6.6872D-02	1.9169D 00	2.9477D 00	6.5029D-01	-4.3034D-01
7.0	4.6004D-02	6.6132D-02	1.9459D 00	3.0790D 00	6.6311D-01	-4.1081D-01

7.2	4.0239D-02	6.5433D-02	1.9741D 00	3.2129D 00	6.7588D-01	-3.9174D-01
7.4	3.5107D-02	6.4772D-02	2.0015D 00	3.3494D 00	6.8860D-01	-3.7310D-01
7.6	3.0551D-02	6.4144D-02	2.0281D 00	3.4884D 00	7.0125D-01	-3.5489D-01
7.8	2.6520D-02	6.3545D-02	2.0541D 00	3.6299D 00	7.1384D-01	-3.3709D-01
8.0	2.2963D-02	6.2972D-02	2.0794D 00	3.7739D 00	7.2636D-01	-3.1970D-01
8.2	1.9833D-02	6.2422D-02	2.1041D 00	3.9204D 00	7.3881D-01	-3.0271D-01
8.4	1.7088D-02	6.1893D-02	2.1282D 00	4.0694D 00	7.5118D-01	-2.8611D-01
8.6	1.4686D-02	6.1382D-02	2.1518D 00	4.2209D 00	7.6346D-01	-2.6989D-01
8.8	1.2591D-02	6.0887D-02	2.1748D 00	4.3748D 00	7.7566D-01	-2.5404D-01
9.0	1.0769D-02	6.0406D-02	2.1972D 00	4.5311D 00	7.8776D-01	-2.3856D-01
9.2	9.1878D-03	5.9938D-02	2.2192D 00	4.6899D 00	7.9977D-01	-2.2343D-01
9.4	7.8203D-03	5.9480D-02	2.2407D 00	4.8510D 00	8.1168D-01	-2.0865D-01
9.6	6.6406D-03	5.9032D-02	2.2618D 00	5.0145D 00	8.2349D-01	-1.9421D-01
9.8	5.6257D-03	5.8592D-02	2.2824D 00	5.1804D 00	8.3519D-01	-1.8010D-01
10.0	4.7547D-03	5.8159D-02	2.3026D 00	5.3486D 00	8.4678D-01	-1.6632D-01
10.2	4.0094D-03	5.7733D-02	2.3224D 00	5.5191D 00	8.5826D-01	-1.5285D-01
10.4	3.3731D-03	5.7312D-02	2.3418D 00	5.6919D 00	8.6962D-01	-1.3970D-01
10.6	2.8315D-03	5.6896D-02	2.3609D 00	5.8670D 00	8.8087D-01	-1.2685D-01
10.8	2.3715D-03	5.6485D-02	2.3795D 00	6.0442D 00	8.9199D-01	-1.1430D-01
11.0	1.9818D-03	5.6077D-02	2.3979D 00	6.2237D 00	9.0300D-01	-1.0203D-01
11.2	1.6525D-03	5.5673D-02	2.4159D 00	6.4054D 00	9.1388D-01	-9.0054D-02
11.4	1.3750D-03	5.5273D-02	2.4336D 00	6.5893D 00	9.2464D-01	-7.8352D-02
11.6	1.1416D-03	5.4875D-02	2.4510D 00	6.7753D 00	9.3527D-01	-6.6919D-02
11.8	9.4588D-04	5.4480D-02	2.4681D 00	6.9634D 00	9.4578D-01	-5.5750D-02
12.0	7.8205D-04	5.4087D-02	2.4849D 00	7.1536D 00	9.5615D-01	-4.4837D-02
12.2	6.4527D-04	5.3697D-02	2.5014D 00	7.3458D 00	9.6640D-01	-3.4175D-02
12.4	5.3132D-04	5.3310D-02	2.5177D 00	7.5401D 00	9.7652D-01	-2.3756D-02
12.6	4.3662D-04	5.2926D-02	2.5337D 00	7.7364D 00	9.8652D-01	-1.3574D-02
12.8	3.5809D-04	5.2544D-02	2.5494D 00	7.9347D 00	9.9638D-01	-3.6226D-03
13.0	2.9310D-04	5.2165D-02	2.5649D 00	8.1350D 00	1.0061D 00	6.1044D-03
13.2	2.3945D-04	5.1789D-02	2.5802D 00	8.3372D 00	1.0157D 00	1.5613D-02
13.4	1.9524D-04	5.1416D-02	2.5953D 00	8.5413D 00	1.0252D 00	2.4911D-02
13.6	1.5890D-04	5.1047D-02	2.6101D 00	8.7473D 00	1.0346D 00	3.4003D-02
13.8	1.2908D-04	5.0680D-02	2.6247D 00	8.9551D 00	1.0438D 00	4.2896D-02
14.0	1.0466D-04	5.0317D-02	2.6391D 00	9.1648D 00	1.0530D 00	5.1596D-02
14.2	8.4710D-05	4.9958D-02	2.6532D 00	9.3763D 00	1.0620D 00	6.0110D-02
14.4	6.8440D-05	4.9602D-02	2.6672D 00	9.5896D 00	1.0708D 00	6.8442D-02
14.6	5.5197D-05	4.9250D-02	2.6810D 00	9.8046D 00	1.0796D 00	7.6600D-02
14.8	4.4439D-05	4.8903D-02	2.6946D 00	1.0021D 01	1.0883D 00	8.4588D-02
15.0	3.5716D-05	4.8559D-02	2.7081D 00	1.0240D 01	1.0968D 00	9.2413D-02

TABLE 9
GRAIN BOUNDARY CONCENTRATION AND RELATED QUANTITIES
VS. G FOR β = 0.1

G	C	A	LOG(G)	Φ	Φ'	LOG(Φ')
0.0	1.0000D 00	0.0		0.0	1.6948D-01	-1.7750D 00
0.2	9.6611D-01	8.9871D-02	-1.6094D 00	3.4473D-02	1.7526D-01	-1.7415D 00
0.4	9.3229D-01	6.7464D-02	-9.1629D-01	7.0111D-02	1.8113D-01	-1.7085D 00
0.6	8.9859D-01	4.8244D-02	-5.1083D-01	1.0693D-01	1.8707D-01	-1.6762D 00
0.8	8.6507D-01	3.4639D-02	-2.2314D-01	1.4495D-01	1.9310D-01	-1.6446D 00
1.0	8.3179D-01	2.5218D-02	0.0	1.8417D-01	1.9919D-01	-1.6135D 00
1.2	7.9881D-01	1.8648D-02	1.8232D-01	2.2463D-01	2.0536D-01	-1.5830D 00
1.4	7.6619D-01	1.4003D-02	3.3647D-01	2.6632D-01	2.1159D-01	-1.5531D 00
1.6	7.3398D-01	1.0667D-02	4.7000D-01	3.0927D-01	2.1790D-01	-1.5237D 00
1.8	7.0224D-01	8.2346D-03	5.8779D-01	3.5348D-01	2.2427D-01	-1.4949D 00
2.0	6.7100D-01	6.4354D-03	6.9315D-01	3.9898D-01	2.3070D-01	-1.4666D 00
2.2	6.4033D-01	5.0867D-03	7.8846D-01	4.4577D-01	2.3720D-01	-1.4388D 00
2.4	6.1026D-01	4.0630D-03	8.7547D-01	4.9387D-01	2.4376D-01	-1.4116D 00
2.6	5.8084D-01	3.2771D-03	9.5551D-01	5.4328D-01	2.5038D-01	-1.3848D 00
2.8	5.5210D-01	2.6672D-03	1.0296D 00	5.9402D-01	2.5705D-01	-1.3585D 00
3.0	5.2409D-01	2.1891D-03	1.0986D 00	6.4610D-01	2.6377D-01	-1.3327D 00
3.2	4.9682D-01	1.8110D-03	1.1632D 00	6.9953D-01	2.7055D-01	-1.3073D 00
3.4	4.7033D-01	1.5093D-03	1.2238D 00	7.5433D-01	2.7739D-01	-1.2823D 00
3.6	4.4464D-01	1.2666D-03	1.2809D 00	8.1049D-01	2.8427D-01	-1.2578D 00
3.8	4.1978D-01	1.0699D-03	1.3350D 00	8.6803D-01	2.9119D-01	-1.2338D 00
4.0	3.9575D-01	9.0936D-04	1.3863D 00	9.2697D-01	2.9817D-01	-1.2101D 00
4.2	3.7258D-01	7.7741D-04	1.4351D 00	9.8730D-01	3.0518D-01	-1.1868D 00
4.4	3.5027D-01	6.6828D-04	1.4816D 00	1.0490D 00	3.1224D-01	-1.1640D 00
4.6	3.2883D-01	5.7748D-04	1.5261D 00	1.1122D 00	3.1934D-01	-1.1415D 00
4.8	3.0827D-01	5.0150D-04	1.5686D 00	1.1768D 00	3.2648D-01	-1.1194D 00
5.0	2.8858D-01	4.3758D-04	1.6094D 00	1.2428D 00	3.3366D-01	-1.0976D 00
5.2	2.6975D-01	3.8353D-04	1.6487D 00	1.3103D 00	3.4087D-01	-1.0762D 00
5.4	2.5179D-01	3.3759D-04	1.6864D 00	1.3792D 00	3.4812D-01	-1.0552D 00
5.6	2.3469D-01	2.9838D-04	1.7228D 00	1.4495D 00	3.5540D-01	-1.0345D 00
5.8	2.1843D-01	2.6475D-04	1.7579D 00	1.5213D 00	3.6271D-01	-1.0141D 00
6.0	2.0299D-01	2.3579D-04	1.7918D 00	1.5946D 00	3.7006D-01	-9.9410D-01
6.2	1.8837D-01	2.1075D-04	1.8245D 00	1.6693D 00	3.7743D-01	-9.7438D-01
6.4	1.7455D-01	1.8901D-04	1.8563D 00	1.7456D 00	3.8483D-01	-9.5496D-01
6.6	1.6150D-01	1.7007D-04	1.8871D 00	1.8233D 00	3.9225D-01	-9.3585D-01
6.8	1.4920D-01	1.5351D-04	1.9169D 00	1.9025D 00	3.9970D-01	-9.1704D-01
7.0	1.3763D-01	1.3897D-04	1.9459D 00	1.9832D 00	4.0717D-01	-8.9851D-01

7.2	1.2678D-01	1.2618D-04	1.9741D 00	2.0653D 00	4.1467D-01	-8.8027D-01
7.4	1.1660D-01	1.1489D-04	2.0015D 00	2.1490D 00	4.2219D-01	-8.6231D-01
7.6	1.0708D-01	1.0488D-04	2.0281D 00	2.2342D 00	4.2972D-01	-8.4462D-01
7.8	9.8184D-02	9.5994D-05	2.0541D 00	2.3209D 00	4.3728D-01	-8.2719D-01
8.0	8.9894D-02	8.8076D-05	2.0794D 00	2.4091D 00	4.4485D-01	-8.1002D-01
8.2	8.2179D-02	8.1003D-05	2.1041D 00	2.4989D 00	4.5244D-01	-7.9310D-01
8.4	7.5013D-02	7.4668D-05	2.1282D 00	2.5901D 00	4.6004D-01	-7.7644D-01
8.6	6.8367D-02	6.8980D-05	2.1518D 00	2.6829D 00	4.6766D-01	-7.6001D-01
8.8	6.2215D-02	6.3861D-05	2.1748D 00	2.7772D 00	4.7529D-01	-7.4383D-01
9.0	5.6530D-02	5.9242D-05	2.1972D 00	2.8730D 00	4.8293D-01	-7.2787D-01
9.2	5.1286D-02	5.5065D-05	2.2192D 00	2.9703D 00	4.9059D-01	-7.1215D-01
9.4	4.6457D-02	5.1280D-05	2.2407D 00	3.0692D 00	4.9825D-01	-6.9665D-01
9.6	4.2019D-02	4.7843D-05	2.2618D 00	3.1696D 00	5.0592D-01	-6.8137D-01
9.8	3.7946D-02	4.4715D-05	2.2824D 00	3.2716D 00	5.1360D-01	-6.6630D-01
10.0	3.4215D-02	4.1863D-05	2.3026D 00	3.3751D 00	5.2129D-01	-6.5145D-01
10.2	3.0804D-02	3.9257D-05	2.3224D 00	3.4801D 00	5.2898D-01	-6.3680D-01
10.4	2.7690D-02	3.6871D-05	2.3418D 00	3.5867D 00	5.3668D-01	-6.2235D-01
10.6	2.4853D-02	3.4684D-05	2.3609D 00	3.6948D 00	5.4438D-01	-6.0810D-01
10.8	2.2272D-02	3.2674D-05	2.3795D 00	3.8044D 00	5.5209D-01	-5.9405D-01
11.0	1.9928D-02	3.0825D-05	2.3979D 00	3.9156D 00	5.5979D-01	-5.8018D-01
11.2	1.7804D-02	2.9121D-05	2.4159D 00	4.0283D 00	5.6750D-01	-5.6651D-01
11.4	1.5881D-02	2.7548D-05	2.4336D 00	4.1426D 00	5.7521D-01	-5.5302D-01
11.6	1.4144D-02	2.6093D-05	2.4510D 00	4.2584D 00	5.8292D-01	-5.3971D-01
11.8	1.2578D-02	2.4746D-05	2.4681D 00	4.3758D 00	5.9063D-01	-5.2657D-01
12.0	1.1168D-02	2.3496D-05	2.4849D 00	4.4947D 00	5.9833D-01	-5.1361D-01
12.2	9.9010D-03	2.2336D-05	2.5014D 00	4.6151D 00	6.0603D-01	-5.0083D-01
12.4	8.7641D-03	2.1256D-05	2.5177D 00	4.7371D 00	6.1373D-01	-4.8820D-01
12.6	7.7458D-03	2.0251D-05	2.5337D 00	4.8606D 00	6.2142D-01	-4.7575D-01
12.8	6.8353D-03	1.9314D-05	2.5494D 00	4.9857D 00	6.2911D-01	-4.6346D-01
13.0	6.0225D-03	1.8438D-05	2.5649D 00	5.1123D 00	6.3679D-01	-4.5132D-01
13.2	5.2983D-03	1.7620D-05	2.5802D 00	5.2404D 00	6.4446D-01	-4.3934D-01
13.4	4.6540D-03	1.6854D-05	2.5953D 00	5.3700D 00	6.5212D-01	-4.2752D-01
13.6	4.0818D-03	1.6136D-05	2.6101D 00	5.5012D 00	6.5978D-01	-4.1585D-01
13.8	3.5744D-03	1.5462D-05	2.6247D 00	5.6339D 00	6.6743D-01	-4.0432D-01
14.0	3.1254D-03	1.4829D-05	2.6391D 00	5.7682D 00	6.7506D-01	-3.9295D-01
14.2	2.7286D-03	1.4234D-05	2.6532D 00	5.9040D 00	6.8269D-01	-3.8172D-01
14.4	2.3785D-03	1.3674D-05	2.6672D 00	6.0413D 00	6.9030D-01	-3.7063D-01
14.6	2.0702D-03	1.3146D-05	2.6810D 00	6.1801D 00	6.9790D-01	-3.5967D-01
14.8	1.7992D-03	1.2647D-05	2.6946D 00	6.3204D 00	7.0549D-01	-3.4886D-01
15.0	1.5612D-03	1.2177D-05	2.7081D 00	6.4623D 00	7.1307D-01	-3.3818D-01

TABLE 10
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR $\beta = \infty$

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\bar{\Phi}'$)
0.2	9.2668D-01	1.1454D-01	-1.6094D 00	7.6152D-02	9.9156D-01	-8.4808D-03
0.4	7.5895D-01	2.5710D-01	-9.1629D-01	2.7582D-01	1.0051D 00	5.0911D-03
0.6	6.1991D-01	3.9845D-01	-5.1083D-01	4.7818D-01	1.0184D 00	1.8231D-02
0.8	5.0502D-01	5.3269D-01	-2.2314D-01	6.8317D-01	1.0314D 00	3.0964D-02
1.0	4.1035D-01	6.5818D-01	0.0	8.9074D-01	1.0443D 00	4.3312D-02
1.2	3.3259D-01	7.7471D-01	1.8232D-01	1.1009D 00	1.0569D 00	5.5294D-02
1.4	2.6889D-01	8.8261D-01	3.3647D-01	1.3135D 00	1.0692D 00	6.6931D-02
1.6	2.1685D-01	9.8246D-01	4.7000D-01	1.5285D 00	1.0814D 00	7.8241D-02
1.8	1.7447D-01	1.0749D 00	5.8779D-01	1.7460D 00	1.0933D 00	8.9238D-02
2.0	1.4004D-01	1.1605D 00	6.9315D-01	1.9659D 00	1.1051D 00	9.9939D-02
2.2	1.1214D-01	1.2400D 00	7.8846D-01	2.1880D 00	1.1167D 00	1.1036D-01
2.4	8.9590D-02	1.3138D 00	8.7547D-01	2.4125D 00	1.1281D 00	1.2051D-01
2.6	7.1415D-02	1.3826D 00	9.5551D-01	2.6393D 00	1.1393D 00	1.3040D-01
2.8	5.6800D-02	1.4466D 00	1.0296D 00	2.8682D 00	1.1503D 00	1.4005D-01
3.0	4.5077D-02	1.5064D 00	1.0986D 00	3.0994D 00	1.1612D 00	1.4947D-01
3.2	3.5697D-02	1.5623D 00	1.1632D 00	3.3327D 00	1.1719D 00	1.5866D-01
3.4	2.8208D-02	1.6146D 00	1.2238D 00	3.5681D 00	1.1825D 00	1.6764D-01
3.6	2.2244D-02	1.6637D 00	1.2809D 00	3.8057D 00	1.1929D 00	1.7641D-01
3.8	1.7504D-02	1.7098D 00	1.3350D 00	4.0453D 00	1.2032D 00	1.8499D-01
4.0	1.3747D-02	1.7532D 00	1.3863D 00	4.2870D 00	1.2133D 00	1.9338D-01
4.2	1.0774D-02	1.7940D 00	1.4351D 00	4.5306D 00	1.2233D 00	2.0159D-01
4.4	8.4272D-03	1.8326D 00	1.4816D 00	4.7763D 00	1.2332D 00	2.0962D-01
4.6	6.5788D-03	1.8689D 00	1.5261D 00	5.0239D 00	1.2430D 00	2.1749D-01
4.8	5.1258D-03	1.9033D 00	1.5686D 00	5.2735D 00	1.2526D 00	2.2520D-01
5.0	3.9862D-03	1.9359D 00	1.6094D 00	5.5249D 00	1.2621D 00	2.3275D-01
5.2	3.0940D-03	1.9667D 00	1.6487D 00	5.7783D 00	1.2714D 00	2.4015D-01
5.4	2.3971D-03	1.9960D 00	1.6864D 00	6.0335D 00	1.2807D 00	2.4741D-01
5.6	1.8537D-03	2.0238D 00	1.7228D 00	6.2906D 00	1.2899D 00	2.5453D-01
5.8	1.4309D-03	2.0502D 00	1.7579D 00	6.5494D 00	1.2989D 00	2.6152D-01
6.0	1.1026D-03	2.0753D 00	1.7918D 00	6.8101D 00	1.3078D 00	2.6838D-01
6.2	8.4806D-04	2.0993D 00	1.8245D 00	7.0726D 00	1.3167D 00	2.7511D-01
6.4	6.5115D-04	2.1221D 00	1.8563D 00	7.3368D 00	1.3254D 00	2.8173D-01
6.6	4.9909D-04	2.1439D 00	1.8871D 00	7.6027D 00	1.3341D 00	2.8823D-01
6.8	3.8189D-04	2.1647D 00	1.9169D 00	7.8704D 00	1.3426D 00	2.9461D-01
7.0	2.9171D-04	2.1846D 00	1.9459D 00	8.1398D 00	1.3511D 00	3.0089D-01

7.2	2.2245D-04	2.2036D 00	1.9741D 00	8.4108D 00	1.3594D 00	3.0706D-01
7.4	1.6935D-04	2.2218D 00	2.0015D 00	8.6835D 00	1.3677D 00	3.1313D-01
7.6	1.2872D-04	2.2392D 00	2.0281D 00	8.9579D 00	1.3759D 00	3.1910D-01
7.8	9.7675D-05	2.2559D 00	2.0541D 00	9.2339D 00	1.3840D 00	3.2497D-01
8.0	7.3998D-05	2.2720D 00	2.0794D 00	9.5115D 00	1.3920D 00	3.3075D-01
8.2	5.5971D-05	2.2874D 00	2.1041D 00	9.7907D 00	1.4000D 00	3.3644D-01
8.4	4.2269D-05	2.3021D 00	2.1282D 00	1.0071D 01	1.4078D 00	3.4205D-01
8.6	3.1872D-05	2.3164D 00	2.1518D 00	1.0354D 01	1.4156D 00	3.4757D-01
8.8	2.3994D-05	2.3300D 00	2.1748D 00	1.0638D 01	1.4233D 00	3.5300D-01
9.0	1.8036D-05	2.3432D 00	2.1972D 00	1.0923D 01	1.4310D 00	3.5836D-01
9.2	1.3537D-05	2.3559D 00	2.2192D 00	1.1210D 01	1.4385D 00	3.6363D-01
9.4	1.0145D-05	2.3681D 00	2.2407D 00	1.1499D 01	1.4460D 00	3.6883D-01
9.6	7.5914D-06	2.3798D 00	2.2618D 00	1.1788D 01	1.4535D 00	3.7396D-01
9.8	5.6723D-06	2.3912D 00	2.2824D 00	1.2080D 01	1.4608D 00	3.7901D-01
10.0	4.2321D-06	2.4021D 00	2.3026D 00	1.2373D 01	1.4681D 00	3.8400D-01
10.2	3.1529D-06	2.4127D 00	2.3224D 00	1.2667D 01	1.4754D 00	3.8892D-01
10.4	2.3456D-06	2.4229D 00	2.3418D 00	1.2963D 01	1.4826D 00	3.9377D-01
10.6	1.7425D-06	2.4328D 00	2.3609D 00	1.3260D 01	1.4897D 00	3.9855D-01
10.8	1.2926D-06	2.4423D 00	2.3795D 00	1.3559D 01	1.4967D 00	4.0327D-01
11.0	9.5756D-07	2.4516D 00	2.3979D 00	1.3859D 01	1.5037D 00	4.0793D-01
11.2	7.0836D-07	2.4605D 00	2.4159D 00	1.4160D 01	1.5106D 00	4.1254D-01
11.4	5.2329D-07	2.4692D 00	2.4336D 00	1.4463D 01	1.5175D 00	4.1708D-01
11.6	3.8604D-07	2.4775D 00	2.4510D 00	1.4767D 01	1.5243D 00	4.2156D-01
11.8	2.8441D-07	2.4857D 00	2.4681D 00	1.5073D 01	1.5311D 00	4.2599D-01
12.0	2.0925D-07	2.4935D 00	2.4849D 00	1.5380D 01	1.5378D 00	4.3037D-01
12.2	1.5374D-07	2.5012D 00	2.5014D 00	1.5688D 01	1.5445D 00	4.3469D-01
12.4	1.1281D-07	2.5086D 00	2.5177D 00	1.5998D 01	1.5511D 00	4.3896D-01
12.6	8.2669D-08	2.5157D 00	2.5337D 00	1.6308D 01	1.5576D 00	4.4318D-01
12.8	6.0501D-08	2.5227D 00	2.5494D 00	1.6621D 01	1.5642D 00	4.4735D-01
13.0	4.4220D-08	2.5295D 00	2.5649D 00	1.6934D 01	1.5706D 00	4.5147D-01
13.2	3.2279D-08	2.5361D 00	2.5802D 00	1.7249D 01	1.5770D 00	4.5554D-01
13.4	2.3532D-08	2.5425D 00	2.5953D 00	1.7565D 01	1.5834D 00	4.5957D-01
13.6	1.7134D-08	2.5487D 00	2.6101D 00	1.7882D 01	1.5897D 00	4.6355D-01
13.8	1.2460D-08	2.5547D 00	2.6247D 00	1.8201D 01	1.5960D 00	4.6749D-01
14.0	9.0492D-09	2.5606D 00	2.6391D 00	1.8521D 01	1.6022D 00	4.7138D-01
14.2	6.5641D-09	2.5663D 00	2.6532D 00	1.8842D 01	1.6084D 00	4.7523D-01
14.4	4.7556D-09	2.5719D 00	2.6672D 00	1.9164D 01	1.6145D 00	4.7904D-01
14.6	3.4412D-09	2.5773D 00	2.6810D 00	1.9487D 01	1.6206D 00	4.8281D-01
14.8	2.4870D-09	2.5826D 00	2.6946D 00	1.9812D 01	1.6267D 00	4.8654D-01
15.0	1.7952D-09	2.5878D 00	2.7081D 00	2.0138D 01	1.6327D 00	4.9023D-01

TABLE 11
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 100.0

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	7.5712D-01	9.3457D-02	-1.6094D 00	2.7824D-01	-1.8836D 00	6.3319D-01
0.4	7.6084D-01	2.5719D-01	-9.1629D-01	2.7333D-01	8.5716D-01	-1.5414D-01
0.6	6.2593D-01	4.0118D-01	-5.1083D-01	4.6852D-01	1.0158D 00	1.5658D-02
0.8	5.1008D-01	5.3620D-01	-2.2314D-01	6.7319D-01	1.0301D 00	2.9612D-02
1.0	4.1458D-01	6.6234D-01	0.0	8.8049D-01	1.0429D 00	4.1987D-02
1.2	3.3611D-01	7.7941D-01	1.8232D-01	1.0903D 00	1.0555D 00	5.3995D-02
1.4	2.7181D-01	8.8778D-01	3.3647D-01	1.3027D 00	1.0679D 00	6.5655D-02
1.6	2.1927D-01	9.8803D-01	4.7000D-01	1.5175D 00	1.0800D 00	7.6987D-02
1.8	1.7646D-01	1.0808D 00	5.8779D-01	1.7347D 00	1.0920D 00	8.8007D-02
2.0	1.4167D-01	1.1667D 00	6.9315D-01	1.9542D 00	1.1038D 00	9.8729D-02
2.2	1.1348D-01	1.2464D 00	7.8846D-01	2.1762D 00	1.1154D 00	1.0917D-01
2.4	9.0685D-02	1.3205D 00	8.7547D-01	2.4004D 00	1.1268D 00	1.1934D-01
2.6	7.2306D-02	1.3893D 00	9.5551D-01	2.6268D 00	1.1380D 00	1.2925D-01
2.8	5.7524D-02	1.4535D 00	1.0296D 00	2.8555D 00	1.1490D 00	1.3892D-01
3.0	4.5664D-02	1.5134D 00	1.0986D 00	3.0864D 00	1.1599D 00	1.4835D-01
3.2	3.6171D-02	1.5694D 00	1.1632D 00	3.3195D 00	1.1707D 00	1.5756D-01
3.4	2.8590D-02	1.6218D 00	1.2238D 00	3.5547D 00	1.1812D 00	1.6656D-01
3.6	2.2551D-02	1.6710D 00	1.2809D 00	3.7920D 00	1.1917D 00	1.7535D-01
3.8	1.7750D-02	1.7172D 00	1.3350D 00	4.0314D 00	1.2019D 00	1.8394D-01
4.0	1.3943D-02	1.7606D 00	1.3863D 00	4.2728D 00	1.2121D 00	1.9234D-01
4.2	1.0931D-02	1.8014D 00	1.4351D 00	4.5162D 00	1.2221D 00	2.0057D-01
4.4	8.5520D-03	1.8400D 00	1.4816D 00	4.7616D 00	1.2320D 00	2.0861D-01
4.6	6.6779D-03	1.8764D 00	1.5261D 00	5.0090D 00	1.2417D 00	2.1650D-01
4.8	5.2043D-03	1.9108D 00	1.5686D 00	5.2583D 00	1.2513D 00	2.2422D-01
5.0	4.0482D-03	1.9433D 00	1.6094D 00	5.5095D 00	1.2608D 00	2.3178D-01
5.2	3.1429D-03	1.9742D 00	1.6487D 00	5.7626D 00	1.2702D 00	2.3920D-01
5.4	2.4356D-03	2.0034D 00	1.6864D 00	6.0176D 00	1.2795D 00	2.4647D-01
5.6	1.8839D-03	2.0312D 00	1.7228D 00	6.2744D 00	1.2887D 00	2.5360D-01
5.8	1.4546D-03	2.0576D 00	1.7579D 00	6.5330D 00	1.2977D 00	2.6060D-01
6.0	1.1211D-03	2.0827D 00	1.7918D 00	6.7935D 00	1.3067D 00	2.6747D-01
6.2	8.6250D-04	2.1066D 00	1.8245D 00	7.0557D 00	1.3155D 00	2.7422D-01
6.4	6.6239D-04	2.1294D 00	1.8563D 00	7.3197D 00	1.3242D 00	2.8084D-01
6.6	5.0783D-04	2.1512D 00	1.8871D 00	7.5854D 00	1.3329D 00	2.8735D-01
6.8	3.8866D-04	2.1719D 00	1.9169D 00	7.8528D 00	1.3414D 00	2.9374D-01
7.0	2.9695D-04	2.1918D 00	1.9459D 00	8.1219D 00	1.3499D 00	3.0003D-01

7.2	2.2650D-04	2.2108D 00	1.9741D 00	8.3928D 00	1.3583D 00	3.0621D-01
7.4	1.7248D-04	2.2289D 00	2.0015D 00	8.6652D 00	1.3665D 00	3.1229D-01
7.6	1.3112D-04	2.2463D 00	2.0281D 00	8.9394D 00	1.3747D 00	3.1827D-01
7.8	9.9522D-05	2.2630D 00	2.0541D 00	9.2151D 00	1.3829D 00	3.2415D-01
8.0	7.5415D-05	2.2790D 00	2.0794D 00	9.4925D 00	1.3909D 00	3.2994D-01
8.2	5.7056D-05	2.2943D 00	2.1041D 00	9.7715D 00	1.3988D 00	3.3564D-01
8.4	4.3098D-05	2.3091D 00	2.1282D 00	1.0052D 01	1.4067D 00	3.4125D-01
8.6	3.2504D-05	2.3233D 00	2.1518D 00	1.0334D 01	1.4145D 00	3.4678D-01
8.8	2.4476D-05	2.3369D 00	2.1748D 00	1.0618D 01	1.4222D 00	3.5222D-01
9.0	1.8402D-05	2.3500D 00	2.1972D 00	1.0903D 01	1.4299D 00	3.5758D-01
9.2	1.3815D-05	2.3626D 00	2.2192D 00	1.1190D 01	1.4374D 00	3.6287D-01
9.4	1.0355D-05	2.3748D 00	2.2407D 00	1.1478D 01	1.4449D 00	3.6807D-01
9.6	7.7505D-06	2.3865D 00	2.2618D 00	1.1768D 01	1.4524D 00	3.7321D-01
9.8	5.7924D-06	2.3978D 00	2.2824D 00	1.2059D 01	1.4598D 00	3.7827D-01
10.0	4.3226D-06	2.4088D 00	2.3026D 00	1.2352D 01	1.4671D 00	3.8326D-01
10.2	3.2211D-06	2.4193D 00	2.3224D 00	1.2646D 01	1.4743D 00	3.8818D-01
10.4	2.3968D-06	2.4295D 00	2.3418D 00	1.2941D 01	1.4815D 00	3.9304D-01
10.6	1.7809D-06	2.4393D 00	2.3609D 00	1.3238D 01	1.4886D 00	3.9783D-01
10.8	1.3214D-06	2.4488D 00	2.3795D 00	1.3537D 01	1.4957D 00	4.0256D-01
11.0	9.7910D-07	2.4580D 00	2.3979D 00	1.3837D 01	1.5026D 00	4.0723D-01
11.2	7.2445D-07	2.4669D 00	2.4159D 00	1.4138D 01	1.5096D 00	4.1184D-01
11.4	5.3529D-07	2.4755D 00	2.4336D 00	1.4440D 01	1.5165D 00	4.1638D-01
11.6	3.9498D-07	2.4839D 00	2.4510D 00	1.4744D 01	1.5233D 00	4.2087D-01
11.8	2.9105D-07	2.4919D 00	2.4681D 00	1.5050D 01	1.5301D 00	4.2531D-01
12.0	2.1418D-07	2.4998D 00	2.4849D 00	1.5356D 01	1.5368D 00	4.2969D-01
12.2	1.5740D-07	2.5074D 00	2.5014D 00	1.5664D 01	1.5434D 00	4.3402D-01
12.4	1.1552D-07	2.5147D 00	2.5177D 00	1.5974D 01	1.5501D 00	4.3829D-01
12.6	8.4670D-08	2.5219D 00	2.5337D 00	1.6285D 01	1.5566D 00	4.4252D-01
12.8	6.1979D-08	2.5288D 00	2.5494D 00	1.6596D 01	1.5631D 00	4.4669D-01
13.0	4.5309D-08	2.5355D 00	2.5649D 00	1.6910D 01	1.5696D 00	4.5082D-01
13.2	3.3081D-08	2.5421D 00	2.5802D 00	1.7224D 01	1.5760D 00	4.5489D-01
13.4	2.4122D-08	2.5485D 00	2.5953D 00	1.7540D 01	1.5824D 00	4.5893D-01
13.6	1.7567D-08	2.5546D 00	2.6101D 00	1.7857D 01	1.5887D 00	4.6291D-01
13.8	1.2777D-08	2.5606D 00	2.6247D 00	1.8176D 01	1.5950D 00	4.6686D-01
14.0	9.2815D-09	2.5665D 00	2.6391D 00	1.8495D 01	1.6012D 00	4.7075D-01
14.2	6.7340D-09	2.5722D 00	2.6532D 00	1.8816D 01	1.6074D 00	4.7461D-01
14.4	4.8796D-09	2.5777D 00	2.6672D 00	1.9138D 01	1.6135D 00	4.7842D-01
14.6	3.5316D-09	2.5831D 00	2.6810D 00	1.9462D 01	1.6196D 00	4.8220D-01
14.8	2.5529D-09	2.5884D 00	2.6946D 00	1.9786D 01	1.6257D 00	4.8593D-01
15.0	1.8432D-09	2.5935D 00	2.7081D 00	2.0112D 01	1.6317D 00	4.8962D-01

TABLE 12
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 10.0

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	2.2791D-01	2.7792D-02	-1.6094D 00	1.4788D 00	-4.5102D 00	1.5063D 00
0.4	3.9479D-01	1.3089D-01	-9.1629D-01	9.2941D-01	-1.5625D 00	4.4631D-01
0.6	4.7248D-01	2.9523D-01	-5.1083D-01	7.4976D-01	-3.6235D-01	-1.0152D 00
0.8	4.7205D-01	4.8118D-01	-2.2314D-01	7.5067D-01	3.1205D-01	-1.1646D 00
1.0	4.2490D-01	6.5500D-01	0.0	8.5590D-01	7.0292D-01	-3.5251D-01
1.2	3.6068D-01	8.0332D-01	1.8232D-01	1.0198D 00	9.1201D-01	-9.2106D-02
1.4	2.9717D-01	9.2820D-01	3.3647D-01	1.2134D 00	1.0115D 00	1.1463D-02
1.6	2.4154D-01	1.0365D 00	4.7000D-01	1.4207D 00	1.0556D 00	5.4116D-02
1.8	1.9511D-01	1.1335D 00	5.8779D-01	1.6342D 00	1.0771D 00	7.4285D-02
2.0	1.5706D-01	1.2222D 00	6.9315D-01	1.8511D 00	1.0912D 00	8.7316D-02
2.2	1.2611D-01	1.3040D 00	7.8846D-01	2.0706D 00	1.1033D 00	9.8348D-02
2.4	1.0102D-01	1.3798D 00	8.7547D-01	2.2924D 00	1.1149D 00	1.0876D-01
2.6	8.0740D-02	1.4501D 00	9.5551D-01	2.5165D 00	1.1262D 00	1.1885D-01
2.8	6.4384D-02	1.5154D 00	1.0296D 00	2.7429D 00	1.1373D 00	1.2869D-01
3.0	5.1229D-02	1.5763D 00	1.0986D 00	2.9714D 00	1.1483D 00	1.3828D-01
3.2	4.0673D-02	1.6331D 00	1.1632D 00	3.2022D 00	1.1591D 00	1.4764D-01
3.4	3.2223D-02	1.6861D 00	1.2238D 00	3.4351D 00	1.1697D 00	1.5679D-01
3.6	2.5474D-02	1.7357D 00	1.2809D 00	3.6701D 00	1.1802D 00	1.6572D-01
3.8	2.0097D-02	1.7823D 00	1.3350D 00	3.9072D 00	1.1906D 00	1.7445D-01
4.0	1.5823D-02	1.8259D 00	1.3863D 00	4.1463D 00	1.2008D 00	1.8299D-01
4.2	1.2432D-02	1.8670D 00	1.4351D 00	4.3875D 00	1.2109D 00	1.9135D-01
4.4	9.7484D-03	1.9056D 00	1.4816D 00	4.6307D 00	1.2208D 00	1.9952D-01
4.6	7.6290D-03	1.9420D 00	1.5261D 00	4.8758D 00	1.2306D 00	2.0752D-01
4.8	5.9588D-03	1.9763D 00	1.5686D 00	5.1229D 00	1.2403D 00	2.1536D-01
5.0	4.6452D-03	2.0088D 00	1.6094D 00	5.3719D 00	1.2499D 00	2.2304D-01
5.2	3.6144D-03	2.0395D 00	1.6487D 00	5.6228D 00	1.2593D 00	2.3057D-01
5.4	2.8070D-03	2.0686D 00	1.6864D 00	5.8756D 00	1.2686D 00	2.3795D-01
5.6	2.1760D-03	2.0961D 00	1.7228D 00	6.1303D 00	1.2779D 00	2.4519D-01
5.8	1.6837D-03	2.1223D 00	1.7579D 00	6.3868D 00	1.2870D 00	2.5229D-01
6.0	1.3004D-03	2.1471D 00	1.7918D 00	6.6451D 00	1.2960D 00	2.5926D-01
6.2	1.0026D-03	2.1707D 00	1.8245D 00	6.9052D 00	1.3049D 00	2.6611D-01
6.4	7.7163D-04	2.1932D 00	1.8563D 00	7.1670D 00	1.3137D 00	2.7282D-01
6.6	5.9282D-04	2.2146D 00	1.8871D 00	7.4306D 00	1.3224D 00	2.7942D-01
6.8	4.5466D-04	2.2351D 00	1.9169D 00	7.6960D 00	1.3310D 00	2.8591D-01
7.0	3.4811D-04	2.2546D 00	1.9459D 00	7.9630D 00	1.3395D 00	2.9228D-01

7.2	2.6607D-04	2.2732D 00	1.9741D 00	8.2317D 00	1.3479D 00	2.9855D-01
7.4	2.0303D-04	2.2910D 00	2.0015D 00	8.5022D 00	1.3562D 00	3.0471D-01
7.6	1.5467D-04	2.3080D 00	2.0281D 00	8.7742D 00	1.3645D 00	3.1077D-01
7.8	1.1763D-04	2.3243D 00	2.0541D 00	9.0479D 00	1.3726D 00	3.1673D-01
8.0	8.9321D-05	2.3399D 00	2.0794D 00	9.3233D 00	1.3807D 00	3.2260D-01
8.2	6.7714D-05	2.3548D 00	2.1041D 00	9.6002D 00	1.3887D 00	3.2837D-01
8.4	5.1252D-05	2.3692D 00	2.1282D 00	9.8788D 00	1.3966D 00	3.3406D-01
8.6	3.8731D-05	2.3830D 00	2.1518D 00	1.0159D 01	1.4045D 00	3.3966D-01
8.8	2.9224D-05	2.3962D 00	2.1748D 00	1.0441D 01	1.4122D 00	3.4517D-01
9.0	2.2016D-05	2.4089D 00	2.1972D 00	1.0724D 01	1.4199D 00	3.5060D-01
9.2	1.6560D-05	2.4212D 00	2.2192D 00	1.1008D 01	1.4275D 00	3.5595D-01
9.4	1.2438D-05	2.4329D 00	2.2407D 00	1.1295D 01	1.4351D 00	3.6122D-01
9.6	9.3277D-06	2.4443D 00	2.2618D 00	1.1583D 01	1.4426D 00	3.6642D-01
9.8	6.9848D-06	2.4552D 00	2.2824D 00	1.1872D 01	1.4500D 00	3.7155D-01
10.0	5.2226D-06	2.4657D 00	2.3026D 00	1.2163D 01	1.4573D 00	3.7660D-01
10.2	3.8993D-06	2.4758D 00	2.3224D 00	1.2455D 01	1.4646D 00	3.8158D-01
10.4	2.9071D-06	2.4856D 00	2.3418D 00	1.2748D 01	1.4718D 00	3.8650D-01
10.6	2.1643D-06	2.4951D 00	2.3609D 00	1.3043D 01	1.4790D 00	3.9135D-01
10.8	1.6089D-06	2.5042D 00	2.3795D 00	1.3340D 01	1.4861D 00	3.9613D-01
11.0	1.1944D-06	2.5130D 00	2.3979D 00	1.3638D 01	1.4931D 00	4.0085D-01
11.2	8.8545D-07	2.5215D 00	2.4159D 00	1.3937D 01	1.5001D 00	4.0551D-01
11.4	6.5550D-07	2.5297D 00	2.4336D 00	1.4238D 01	1.5070D 00	4.1012D-01
11.6	4.8459D-07	2.5377D 00	2.4510D 00	1.4540D 01	1.5139D 00	4.1466D-01
11.8	3.5776D-07	2.5454D 00	2.4681D 00	1.4843D 01	1.5207D 00	4.1914D-01
12.0	2.6376D-07	2.5529D 00	2.4849D 00	1.5148D 01	1.5274D 00	4.2357D-01
12.2	1.9420D-07	2.5601D 00	2.5014D 00	1.5454D 01	1.5341D 00	4.2795D-01
12.4	1.4279D-07	2.5671D 00	2.5177D 00	1.5762D 01	1.5408D 00	4.3227D-01
12.6	1.0486D-07	2.5739D 00	2.5337D 00	1.6071D 01	1.5474D 00	4.3655D-01
12.8	7.6897D-08	2.5805D 00	2.5494D 00	1.6381D 01	1.5539D 00	4.4077D-01
13.0	5.6319D-08	2.5869D 00	2.5649D 00	1.6692D 01	1.5604D 00	4.4494D-01
13.2	4.1195D-08	2.5931D 00	2.5802D 00	1.7005D 01	1.5668D 00	4.4906D-01
13.4	3.0093D-08	2.5991D 00	2.5953D 00	1.7319D 01	1.5732D 00	4.5314D-01
13.6	2.1956D-08	2.6050D 00	2.6101D 00	1.7634D 01	1.5796D 00	4.5717D-01
13.8	1.5998D-08	2.6107D 00	2.6247D 00	1.7951D 01	1.5859D 00	4.6115D-01
14.0	1.1643D-08	2.6162D 00	2.6391D 00	1.8269D 01	1.5922D 00	4.6509D-01
14.2	8.4622D-09	2.6215D 00	2.6532D 00	1.8588D 01	1.5984D 00	4.6899D-01
14.4	6.1430D-09	2.6268D 00	2.6672D 00	1.8908D 01	1.6045D 00	4.7284D-01
14.6	4.4540D-09	2.6318D 00	2.6810D 00	1.9229D 01	1.6107D 00	4.7665D-01
14.8	3.2254D-09	2.6368D 00	2.6946D 00	1.9552D 01	1.6168D 00	4.8043D-01
15.0	2.3329D-09	2.6416D 00	2.7081D 00	1.9876D 01	1.6228D 00	4.8416D-01

TABLE 13
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 5.0

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	1.3509D-01	1.6250D-02	-1.6094D 00	2.0018D 00	-4.7249D 00	1.5529D 00
0.4	2.4895D-01	8.0777D-02	-9.1629D-01	1.3905D 00	-1.9593D 00	6.7257D-01
0.6	3.2684D-01	1.9855D-01	-5.1083D-01	1.1183D 00	-8.7893D-01	-1.2905D-01
0.8	3.6399D-01	3.5856D-01	-2.2314D-01	1.0106D 00	-2.4276D-01	-1.4157D 00
1.0	3.6495D-01	5.4070D-01	0.0	1.0080D 00	1.9154D-01	-1.6527D 00
1.2	3.3992D-01	7.2390D-01	1.8232D-01	1.0791D 00	5.0190D-01	-6.8935D-01
1.4	3.0036D-01	8.9269D-01	3.3647D-01	1.2028D 00	7.2228D-01	-3.2534D-01
1.6	2.5580D-01	1.0397D 00	4.7000D-01	1.3633D 00	8.7328D-01	-1.3550D-01
1.8	2.1255D-01	1.1644D 00	5.8779D-01	1.5486D 00	9.7172D-01	-2.8684D-02
2.0	1.7385D-01	1.2702D 00	6.9315D-01	1.7496D 00	1.0330D 00	3.2447D-02
2.2	1.4083D-01	1.3617D 00	7.8846D-01	1.9602D 00	1.0703D 00	6.7959D-02
2.4	1.1341D-01	1.4426D 00	8.7547D-01	2.1768D 00	1.0939D 00	8.9728D-02
2.6	9.0965D-02	1.5156D 00	9.5551D-01	2.3973D 00	1.1103D 00	1.0465D-01
2.8	7.2753D-02	1.5826D 00	1.0296D 00	2.6207D 00	1.1234D 00	1.1640D-01
3.0	5.8043D-02	1.6445D 00	1.0986D 00	2.8466D 00	1.1351D 00	1.2676D-01
3.2	4.6203D-02	1.7019D 00	1.1632D 00	3.0747D 00	1.1462D 00	1.3648D-01
3.4	3.6698D-02	1.7555D 00	1.2238D 00	3.3050D 00	1.1570D 00	1.4584D-01
3.6	2.9086D-02	1.8054D 00	1.2809D 00	3.5375D 00	1.1676D 00	1.5495D-01
3.8	2.3005D-02	1.8521D 00	1.3350D 00	3.7721D 00	1.1780D 00	1.6384D-01
4.0	1.8157D-02	1.8959D 00	1.3863D 00	4.0087D 00	1.1883D 00	1.7253D-01
4.2	1.4302D-02	1.9369D 00	1.4351D 00	4.2474D 00	1.1984D 00	1.8103D-01
4.4	1.1242D-02	1.9755D 00	1.4816D 00	4.4881D 00	1.2085D 00	1.8934D-01
4.6	8.8198D-03	2.0117D 00	1.5261D 00	4.7308D 00	1.2183D 00	1.9749D-01
4.8	6.9058D-03	2.0459D 00	1.5686D 00	4.9754D 00	1.2281D 00	2.0546D-01
5.0	5.3966D-03	2.0780D 00	1.6094D 00	5.2220D 00	1.2377D 00	2.1327D-01
5.2	4.2092D-03	2.1084D 00	1.6487D 00	5.4705D 00	1.2472D 00	2.2092D-01
5.4	3.2769D-03	2.1371D 00	1.6864D 00	5.7209D 00	1.2566D 00	2.2842D-01
5.6	2.5463D-03	2.1643D 00	1.7228D 00	5.9731D 00	1.2659D 00	2.3578D-01
5.8	1.9749D-03	2.1901D 00	1.7579D 00	6.2272D 00	1.2751D 00	2.4300D-01
6.0	1.5290D-03	2.2145D 00	1.7918D 00	6.4831D 00	1.2841D 00	2.5008D-01
6.2	1.1816D-03	2.2377D 00	1.8245D 00	6.7409D 00	1.2931D 00	2.5703D-01
6.4	9.1155D-04	2.2597D 00	1.8563D 00	7.0004D 00	1.3019D 00	2.6386D-01
6.6	7.0196D-04	2.2806D 00	1.8871D 00	7.2616D 00	1.3107D 00	2.7056D-01
6.8	5.3962D-04	2.3005D 00	1.9169D 00	7.5246D 00	1.3194D 00	2.7715D-01
7.0	4.1411D-04	2.3195D 00	1.9459D 00	7.7894D 00	1.3279D 00	2.8362D-01

7.2	3.1726D-04	2.3376D 00	1.9741D 00	8.0558D 00	1.3364D 00	2.8998D-01
7.4	2.4264D-04	2.3549D 00	2.0015D 00	8.3239D 00	1.3448D 00	2.9624D-01
7.6	1.8527D-04	2.3714D 00	2.0281D 00	8.5937D 00	1.3531D 00	3.0239D-01
7.8	1.4123D-04	2.3872D 00	2.0541D 00	8.8652D 00	1.3613D 00	3.0844D-01
8.0	1.0748D-04	2.4023D 00	2.0794D 00	9.1382D 00	1.3694D 00	3.1439D-01
8.2	8.1663D-05	2.4167D 00	2.1041D 00	9.4129D 00	1.3775D 00	3.2025D-01
8.4	6.1949D-05	2.4305D 00	2.1282D 00	9.6892D 00	1.3854D 00	3.2602D-01
8.6	4.6919D-05	2.4438D 00	2.1518D 00	9.9671D 00	1.3933D 00	3.3169D-01
8.8	3.5480D-05	2.4565D 00	2.1748D 00	1.0247D 01	1.4011D 00	3.3729D-01
9.0	2.6789D-05	2.4687D 00	2.1972D 00	1.0528D 01	1.4089D 00	3.4279D-01
9.2	2.0195D-05	2.4804D 00	2.2192D 00	1.0810D 01	1.4165D 00	3.4822D-01
9.4	1.5201D-05	2.4917D 00	2.2407D 00	1.1094D 01	1.4241D 00	3.5357D-01
9.6	1.1425D-05	2.5025D 00	2.2618D 00	1.1380D 01	1.4317D 00	3.5884D-01
9.8	8.5737D-06	2.5129D 00	2.2824D 00	1.1667D 01	1.4391D 00	3.6403D-01
10.0	6.4246D-06	2.5229D 00	2.3026D 00	1.1955D 01	1.4465D 00	3.6915D-01
10.2	4.8072D-06	2.5325D 00	2.3224D 00	1.2245D 01	1.4538D 00	3.7420D-01
10.4	3.5916D-06	2.5418D 00	2.3418D 00	1.2537D 01	1.4611D 00	3.7918D-01
10.6	2.6796D-06	2.5508D 00	2.3609D 00	1.2830D 01	1.4683D 00	3.8410D-01
10.8	1.9963D-06	2.5594D 00	2.3795D 00	1.3124D 01	1.4754D 00	3.8895D-01
11.0	1.4851D-06	2.5678D 00	2.3979D 00	1.3420D 01	1.4825D 00	3.9373D-01
11.2	1.1033D-06	2.5758D 00	2.4159D 00	1.3717D 01	1.4895D 00	3.9845D-01
11.4	8.1849D-07	2.5836D 00	2.4336D 00	1.4016D 01	1.4965D 00	4.0311D-01
11.6	6.0636D-07	2.5911D 00	2.4510D 00	1.4316D 01	1.5034D 00	4.0771D-01
11.8	4.4859D-07	2.5983D 00	2.4681D 00	1.4617D 01	1.5102D 00	4.1226D-01
12.0	3.3142D-07	2.6053D 00	2.4849D 00	1.4920D 01	1.5170D 00	4.1674D-01
12.2	2.4452D-07	2.6121D 00	2.5014D 00	1.5224D 01	1.5237D 00	4.2117D-01
12.4	1.8017D-07	2.6187D 00	2.5177D 00	1.5529D 01	1.5304D 00	4.2555D-01
12.6	1.3257D-07	2.6250D 00	2.5337D 00	1.5836D 01	1.5371D 00	4.2987D-01
12.8	9.7424D-08	2.6312D 00	2.5494D 00	1.6144D 01	1.5436D 00	4.3415D-01
13.0	7.1499D-08	2.6372D 00	2.5649D 00	1.6454D 01	1.5502D 00	4.3837D-01
13.2	5.2405D-08	2.6429D 00	2.5802D 00	1.6764D 01	1.5567D 00	4.4254D-01
13.4	3.8360D-08	2.6485D 00	2.5953D 00	1.7076D 01	1.5631D 00	4.4667D-01
13.6	2.8044D-08	2.6540D 00	2.6101D 00	1.7389D 01	1.5695D 00	4.5075D-01
13.8	2.0476D-08	2.6593D 00	2.6247D 00	1.7704D 01	1.5758D 00	4.5478D-01
14.0	1.4931D-08	2.6644D 00	2.6391D 00	1.8020D 01	1.5821D 00	4.5876D-01
14.2	1.0874D-08	2.6693D 00	2.6532D 00	1.8337D 01	1.5884D 00	4.6271D-01
14.4	7.9098D-09	2.6742D 00	2.6672D 00	1.8655D 01	1.5946D 00	4.6661D-01
14.6	5.7463D-09	2.6788D 00	2.6810D 00	1.8975D 01	1.6007D 00	4.7046D-01
14.8	4.1695D-09	2.6834D 00	2.6946D 00	1.9295D 01	1.6069D 00	4.7428D-01
15.0	3.0217D-09	2.6878D 00	2.7081D 00	1.9617D 01	1.6129D 00	4.7805D-01

TABLE 14
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 2.0

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	6.0235D-02	6.9570D-03	-1.6094D 00	2.8095D 00	-4.8709D 00	1.5833D 00
0.4	1.1590D-01	3.5253D-02	-9.1629D-01	2.1550D 00	-2.3429D 00	8.0775D-01
0.6	1.6307D-01	9.1013D-02	-5.1083D-01	1.8136D 00	-1.2838D 00	2.4981D-01
0.8	1.9893D-01	1.7685D-01	-2.2314D-01	1.6148D 00	-7.4477D-01	-2.9468D-01
1.0	2.2212D-01	2.9214D-01	0.0	1.5046D 00	-3.7701D-01	-9.7549D-01
1.2	2.3267D-01	4.3317D-01	1.8232D-01	1.4581D 00	-9.8327D-02	-2.3195D 00
1.4	2.3186D-01	5.9372D-01	3.3647D-01	1.4616D 00	1.2582D-01	-2.0729D 00
1.6	2.2180D-01	7.6601D-01	4.7000D-01	1.5060D 00	3.1219D-01	-1.1641D 00
1.8	2.0503D-01	9.4180D-01	5.8779D-01	1.5846D 00	4.6970D-01	-7.5566D-01
2.0	1.8410D-01	1.1135D 00	6.9315D-01	1.6923D 00	6.0348D-01	-5.0504D-01
2.2	1.6128D-01	1.2749D 00	7.8846D-01	1.8246D 00	7.1675D-01	-3.3303D-01
2.4	1.3838D-01	1.4220D 00	8.7547D-01	1.9778D 00	8.1181D-01	-2.0849D-01
2.6	1.1669D-01	1.5523D 00	9.5551D-01	2.1482D 00	8.9057D-01	-1.1590D-01
2.8	9.7003D-02	1.6657D 00	1.0296D 00	2.3330D 00	9.5485D-01	-4.6202D-02
3.0	7.9711D-02	1.7630D 00	1.0986D 00	2.5293D 00	1.0065D 00	6.5095D-03
3.2	6.4900D-02	1.8460D 00	1.1632D 00	2.7349D 00	1.0476D 00	4.6462D-02
3.4	5.2456D-02	1.9171D 00	1.2238D 00	2.9478D 00	1.0799D 00	7.6860D-02
3.6	4.2154D-02	1.9783D 00	1.2809D 00	3.1664D 00	1.1054D 00	1.0021D-01
3.8	3.3722D-02	2.0317D 00	1.3350D 00	3.3896D 00	1.1258D 00	1.1848D-01
4.0	2.6877D-02	2.0790D 00	1.3863D 00	3.6165D 00	1.1425D 00	1.3320D-01
4.2	2.1356D-02	2.1215D 00	1.4351D 00	3.8464D 00	1.1566D 00	1.4549D-01
4.4	1.6924D-02	2.1602D 00	1.4816D 00	4.0790D 00	1.1690D 00	1.5618D-01
4.6	1.3380D-02	2.1956D 00	1.5261D 00	4.3140D 00	1.1804D 00	1.6581D-01
4.8	1.0555D-02	2.2285D 00	1.5686D 00	4.5511D 00	1.1910D 00	1.7477D-01
5.0	8.3097D-03	2.2591D 00	1.6094D 00	4.7903D 00	1.2011D 00	1.8327D-01
5.2	6.5287D-03	2.2877D 00	1.6487D 00	5.0315D 00	1.2110D 00	1.9145D-01
5.4	5.1194D-03	2.3145D 00	1.6864D 00	5.2747D 00	1.2207D 00	1.9939D-01
5.6	4.0067D-03	2.3396D 00	1.7228D 00	5.5198D 00	1.2302D 00	2.0714D-01
5.8	3.1299D-03	2.3633D 00	1.7579D 00	5.7668D 00	1.2395D 00	2.1473D-01
6.0	2.4404D-03	2.3856D 00	1.7918D 00	6.0156D 00	1.2488D 00	2.2216D-01
6.2	1.8993D-03	2.4066D 00	1.8245D 00	6.2663D 00	1.2579D 00	2.2945D-01
6.4	1.4755D-03	2.4265D 00	1.8563D 00	6.5188D 00	1.2669D 00	2.3660D-01
6.6	1.1442D-03	2.4452D 00	1.8871D 00	6.7730D 00	1.2759D 00	2.4362D-01
6.8	8.8574D-04	2.4630D 00	1.9169D 00	7.0291D 00	1.2847D 00	2.5051D-01
7.0	6.8445D-04	2.4798D 00	1.9459D 00	7.2869D 00	1.2934D 00	2.5728D-01

7.2	5.2798D-04	2.4957D 00	1.9741D 00	7.5464D 00	1.3020D 00	2.6394D-01
7.4	4.0659D-04	2.5108D 00	2.0015D 00	7.8077D 00	1.3106D 00	2.7048D-01
7.6	3.1257D-04	2.5252D 00	2.0281D 00	8.0707D 00	1.3190D 00	2.7690D-01
7.8	2.3989D-04	2.5388D 00	2.0541D 00	8.3353D 00	1.3274D 00	2.8323D-01
8.0	1.8381D-04	2.5518D 00	2.0794D 00	8.6016D 00	1.3357D 00	2.8944D-01
8.2	1.4060D-04	2.5641D 00	2.1041D 00	8.8696D 00	1.3439D 00	2.9556D-01
8.4	1.0738D-04	2.5758D 00	2.1282D 00	9.1392D 00	1.3520D 00	3.0158D-01
8.6	8.1870D-05	2.5870D 00	2.1518D 00	9.4104D 00	1.3600D 00	3.0750D-01
8.8	6.2323D-05	2.5977D 00	2.1748D 00	9.6832D 00	1.3680D 00	3.1334D-01
9.0	4.7368D-05	2.6079D 00	2.1972D 00	9.9576D 00	1.3759D 00	3.1908D-01
9.2	3.5945D-05	2.6176D 00	2.2192D 00	1.0234D 01	1.3837D 00	3.2474D-01
9.4	2.7234D-05	2.6269D 00	2.2407D 00	1.0511D 01	1.3914D 00	3.3031D-01
9.6	2.0603D-05	2.6357D 00	2.2618D 00	1.0790D 01	1.3991D 00	3.3580D-01
9.8	1.5562D-05	2.6442D 00	2.2824D 00	1.1071D 01	1.4066D 00	3.4121D-01
10.0	1.1737D-05	2.6523D 00	2.3026D 00	1.1353D 01	1.4142D 00	3.4654D-01
10.2	8.8392D-06	2.6601D 00	2.3224D 00	1.1636D 01	1.4216D 00	3.5179D-01
10.4	6.6468D-06	2.6676D 00	2.3418D 00	1.1921D 01	1.4290D 00	3.5698D-01
10.6	4.9908D-06	2.6747D 00	2.3609D 00	1.2208D 01	1.4363D 00	3.6209D-01
10.8	3.7420D-06	2.6816D 00	2.3795D 00	1.2496D 01	1.4436D 00	3.6713D-01
11.0	2.8016D-06	2.6881D 00	2.3979D 00	1.2785D 01	1.4508D 00	3.7210D-01
11.2	2.0945D-06	2.6944D 00	2.4159D 00	1.3076D 01	1.4579D 00	3.7701D-01
11.4	1.5636D-06	2.7005D 00	2.4336D 00	1.3369D 01	1.4650D 00	3.8185D-01
11.6	1.1657D-06	2.7063D 00	2.4510D 00	1.3662D 01	1.4720D 00	3.8663D-01
11.8	8.6780D-07	2.7119D 00	2.4681D 00	1.3957D 01	1.4790D 00	3.9135D-01
12.0	6.4515D-07	2.7173D 00	2.4849D 00	1.4254D 01	1.4859D 00	3.9601D-01
12.2	4.7896D-07	2.7224D 00	2.5014D 00	1.4552D 01	1.4927D 00	4.0061D-01
12.4	3.5510D-07	2.7274D 00	2.5177D 00	1.4851D 01	1.4995D 00	4.0515D-01
12.6	2.6291D-07	2.7322D 00	2.5337D 00	1.5151D 01	1.5063D 00	4.0964D-01
12.8	1.9439D-07	2.7368D 00	2.5494D 00	1.5453D 01	1.5130D 00	4.1407D-01
13.0	1.4354D-07	2.7412D 00	2.5649D 00	1.5757D 01	1.5196D 00	4.1845D-01
13.2	1.0585D-07	2.7455D 00	2.5802D 00	1.6061D 01	1.5262D 00	4.2277D-01
13.4	7.7957D-08	2.7497D 00	2.5953D 00	1.6367D 01	1.5327D 00	4.2705D-01
13.6	5.7338D-08	2.7536D 00	2.6101D 00	1.6674D 01	1.5392D 00	4.3127D-01
13.8	4.2118D-08	2.7575D 00	2.6247D 00	1.6983D 01	1.5457D 00	4.3545D-01
14.0	3.0898D-08	2.7612D 00	2.6391D 00	1.7293D 01	1.5521D 00	4.3958D-01
14.2	2.2639D-08	2.7648D 00	2.6532D 00	1.7604D 01	1.5584D 00	4.4366D-01
14.4	1.6566D-08	2.7682D 00	2.6672D 00	1.7916D 01	1.5647D 00	4.4770D-01
14.6	1.2107D-08	2.7716D 00	2.6810D 00	1.8229D 01	1.5710D 00	4.5169D-01
14.8	8.8371D-09	2.7748D 00	2.6946D 00	1.8544D 01	1.5772D 00	4.5564D-01
15.0	6.4424D-09	2.7779D 00	2.7081D 00	1.8860D 01	1.5834D 00	4.5955D-01

TABLE 15
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 1.0

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	2.9676D-02	3.2026D-03	-1.6094D 00	3.5174D 00	-4.9274D 00	1.5948D 00
0.4	5.8074D-02	1.5860D-02	-9.1629D-01	2.8460D 00	-2.3549D 00	8.5651D-01
0.6	8.4012D-02	4.0717D-02	-5.1083D-01	2.4768D 00	-1.4495D 00	3.7125D-01
0.8	1.0649D-01	7.9792D-02	-2.2314D-01	2.2397D 00	-9.6142D-01	-3.9341D-02
1.0	1.2476D-01	1.3456D-01	0.0	2.0813D 00	-6.4076D-01	-4.4509D-01
1.2	1.3837D-01	2.0589D-01	1.8232D-01	1.9779D 00	-4.0444D-01	-9.0524D-01
1.4	1.4714D-01	2.9394D-01	3.3647D-01	1.9163D 00	-2.1696D-01	-1.5280D 00
1.6	1.5122D-01	3.9810D-01	4.7000D-01	1.8890D 00	-6.0687D-02	-2.8020D 00
1.8	1.5097D-01	5.1704D-01	5.8779D-01	1.8506D 00	7.4078D-02	-2.6026D 00
2.0	1.4696D-01	6.4869D-01	6.9315D-01	1.9176D 00	1.9305D-01	-1.6448D 00
2.2	1.3987D-01	7.9042D-01	7.8846D-01	1.9671D 00	2.9979D-01	-1.2047D 00
2.4	1.3044D-01	9.3918D-01	8.7547D-01	2.0368D 00	3.9657D-01	-9.2490D-01
2.6	1.1942D-01	1.0916D 00	9.5551D-01	2.1251D 00	4.8492D-01	-7.2377D-01
2.8	1.0749D-01	1.2445D 00	1.0296D 00	2.2303D 00	5.6586D-01	-5.6941D-01
3.0	9.5272D-02	1.3946D 00	1.0986D 00	2.3510D 00	6.4009D-01	-4.4614D-01
3.2	8.3247D-02	1.5390D 00	1.1632D 00	2.4859D 00	7.0812D-01	-3.4514D-01
3.4	7.1799D-02	1.6754D 00	1.2238D 00	2.6339D 00	7.7032D-01	-2.6095D-01
3.6	6.1194D-02	1.8019D 00	1.2809D 00	2.7937D 00	8.2698D-01	-1.8998D-01
3.8	5.1596D-02	1.9174D 00	1.3350D 00	2.9643D 00	8.7835D-01	-1.2971D-01
4.0	4.3080D-02	2.0212D 00	1.3863D 00	3.1447D 00	9.2468D-01	-7.8307D-02
4.2	3.5655D-02	2.1131D 00	1.4351D 00	3.3339D 00	9.6623D-01	-3.4353D-02
4.4	2.9279D-02	2.1935D 00	1.4816D 00	3.5309D 00	1.0033D 00	3.2737D-03
4.6	2.3875D-02	2.2631D 00	1.5261D 00	3.7349D 00	1.0361D 00	3.5501D-02
4.8	1.9349D-02	2.3227D 00	1.5686D 00	3.9451D 00	1.0652D 00	6.3118D-02
5.0	1.5596D-02	2.3735D 00	1.6094D 00	4.1607D 00	1.0907D 00	8.6814D-02
5.2	1.2511D-02	2.4165D 00	1.6487D 00	4.3812D 00	1.1131D 00	1.0719D-01
5.4	9.9936D-03	2.4530D 00	1.6864D 00	4.6058D 00	1.1329D 00	1.2480D-01
5.6	7.9532D-03	2.4840D 00	1.7228D 00	4.8342D 00	1.1504D 00	1.4010D-01
5.8	6.3086D-03	2.5104D 00	1.7579D 00	5.0658D 00	1.1659D 00	1.5351D-01
6.0	4.9894D-03	2.5330D 00	1.7918D 00	5.3004D 00	1.1799D 00	1.6541D-01
6.2	3.9356D-03	2.5526D 00	1.8245D 00	5.5377D 00	1.1925D 00	1.7609D-01
6.4	3.0968D-03	2.5697D 00	1.8563D 00	5.7774D 00	1.2042D 00	1.8581D-01
6.6	2.4313D-03	2.5849D 00	1.8871D 00	6.0193D 00	1.2151D 00	1.9479D-01
6.8	1.9048D-03	2.5984D 00	1.9169D 00	6.2634D 00	1.2253D 00	2.0318D-01
7.0	1.4894D-03	2.6105D 00	1.9459D 00	6.5094D 00	1.2351D 00	2.1113D-01

7.2	1.1623D-03	2.6216D 00	1.9741D 00	6.7574D 00	1.2445D 00	2.1872D-01
7.4	9.0535D-04	2.6317D 00	2.0015D 00	7.0072D 00	1.2536D 00	2.2603D-01
7.6	7.0395D-04	2.6410D 00	2.0281D 00	7.2588D 00	1.2625D 00	2.3311D-01
7.8	5.4639D-04	2.6496D 00	2.0541D 00	7.5122D 00	1.2713D 00	2.4001D-01
8.0	4.2335D-04	2.6576D 00	2.0794D 00	7.7673D 00	1.2799D 00	2.4675D-01
8.2	3.2747D-04	2.6650D 00	2.1041D 00	8.0241D 00	1.2883D 00	2.5336D-01
8.4	2.5287D-04	2.6719D 00	2.1282D 00	8.2826D 00	1.2967D 00	2.5984D-01
8.6	1.9494D-04	2.6783D 00	2.1518D 00	8.5428D 00	1.3050D 00	2.6620D-01
8.8	1.5004D-04	2.6843D 00	2.1748D 00	8.8046D 00	1.3132D 00	2.7245D-01
9.0	1.1529D-04	2.6899D 00	2.1972D 00	9.0681D 00	1.3213D 00	2.7861D-01
9.2	8.8445D-05	2.6951D 00	2.2192D 00	9.3331D 00	1.3293D 00	2.8466D-01
9.4	6.7743D-05	2.7000D 00	2.2407D 00	9.5998D 00	1.3373D 00	2.9062D-01
9.6	5.1805D-05	2.7045D 00	2.2618D 00	9.8680D 00	1.3451D 00	2.9649D-01
9.8	3.9554D-05	2.7088D 00	2.2824D 00	1.0138D 01	1.3529D 00	3.0227D-01
10.0	3.0154D-05	2.7128D 00	2.3026D 00	1.0409D 01	1.3607D 00	3.0797D-01
10.2	2.2952D-05	2.7165D 00	2.3224D 00	1.0682D 01	1.3683D 00	3.1358D-01
10.4	1.7444D-05	2.7199D 00	2.3418D 00	1.0957D 01	1.3759D 00	3.1911D-01
10.6	1.3238D-05	2.7232D 00	2.3609D 00	1.1232D 01	1.3834D 00	3.2456D-01
10.8	1.0030D-05	2.7262D 00	2.3795D 00	1.1510D 01	1.3909D 00	3.2994D-01
11.0	7.5891D-06	2.7290D 00	2.3979D 00	1.1789D 01	1.3983D 00	3.3524D-01
11.2	5.7335D-06	2.7317D 00	2.4159D 00	1.2069D 01	1.4056D 00	3.4047D-01
11.4	4.3253D-06	2.7341D 00	2.4336D 00	1.2351D 01	1.4129D 00	3.4562D-01
11.6	3.2582D-06	2.7364D 00	2.4510D 00	1.2634D 01	1.4201D 00	3.5071D-01
11.8	2.4509D-06	2.7386D 00	2.4681D 00	1.2919D 01	1.4272D 00	3.5573D-01
12.0	1.8410D-06	2.7405D 00	2.4849D 00	1.3205D 01	1.4343D 00	3.6068D-01
12.2	1.3809D-06	2.7424D 00	2.5014D 00	1.3493D 01	1.4413D 00	3.6557D-01
12.4	1.0343D-06	2.7441D 00	2.5177D 00	1.3782D 01	1.4483D 00	3.7040D-01
12.6	7.7368D-07	2.7457D 00	2.5337D 00	1.4072D 01	1.4552D 00	3.7516D-01
12.8	5.7792D-07	2.7472D 00	2.5494D 00	1.4364D 01	1.4621D 00	3.7987D-01
13.0	4.3109D-07	2.7485D 00	2.5649D 00	1.4657D 01	1.4689D 00	3.8452D-01
13.2	3.2114D-07	2.7498D 00	2.5802D 00	1.4951D 01	1.4757D 00	3.8911D-01
13.4	2.3891D-07	2.7510D 00	2.5953D 00	1.5247D 01	1.4824D 00	3.9364D-01
13.6	1.7749D-07	2.7520D 00	2.6101D 00	1.5544D 01	1.4890D 00	3.9812D-01
13.8	1.3169D-07	2.7530D 00	2.6247D 00	1.5843D 01	1.4956D 00	4.0255D-01
14.0	9.7580D-08	2.7539D 00	2.6391D 00	1.6143D 01	1.5022D 00	4.0692D-01
14.2	7.2211D-08	2.7548D 00	2.6532D 00	1.6444D 01	1.5087D 00	4.1125D-01
14.4	5.3367D-08	2.7555D 00	2.6672D 00	1.6746D 01	1.5152D 00	4.1552D-01
14.6	3.9390D-08	2.7562D 00	2.6810D 00	1.7050D 01	1.5216D 00	4.1975D-01
14.8	2.9037D-08	2.7568D 00	2.6946D 00	1.7355D 01	1.5280D 00	4.2393D-01
15.0	2.1378D-08	2.7574D 00	2.7081D 00	1.7661D 01	1.5343D 00	4.2806D-01

TABLE 16
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 0.5

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	1.3415D-02	1.2640D-03	-1.6094D 00	4.3114D 00	-4.9597D 00	1.6014D 00
0.4	2.6507D-02	5.8360D-03	-9.1629D-01	3.6303D 00	-2.4194D 00	8.8354D-01
0.6	3.8968D-02	1.4241D-02	-5.1083D-01	3.2450D 00	-1.5459D 00	4.3561D-01
0.8	5.0514D-02	2.6887D-02	-2.2314D-01	2.9855D 00	-1.0891D 00	8.5376D-02
1.0	6.0899D-02	4.4168D-02	0.0	2.7985D 00	-7.9912D-01	-2.2424D-01
1.2	6.9922D-02	6.6466D-02	1.8232D-01	2.6604D 00	-5.9260D-01	-5.2323D-01
1.4	7.7433D-02	9.4134D-02	3.3647D-01	2.5583D 00	-4.3388D-01	-8.3500D-01
1.6	8.3339D-02	1.2748D-01	4.7000D-01	2.4848D 00	-3.0512D-01	-1.1871D 00
1.8	8.7601D-02	1.6676D-01	5.8779D-01	2.4350D 00	-1.9644D-01	-1.6274D 00
2.0	9.0236D-02	2.1214D-01	6.9315D-01	2.4053D 00	-1.0193D-01	-2.2835D 00
2.2	9.1310D-02	2.6371D-01	7.8846D-01	2.3935D 00	-1.7822D-02	-4.0273D 00
2.4	9.0930D-02	3.2144D-01	8.7547D-01	2.3977D 00	5.8365D-02	-2.8410D 00
2.6	8.9239D-02	3.8520D-01	9.5551D-01	2.4164D 00	1.2835D-01	-2.0530D 00
2.8	8.6408D-02	4.5475D-01	1.0296D 00	2.4487D 00	1.9333D-01	-1.6433D 00
3.0	8.2621D-02	5.2974D-01	1.0986D 00	2.4935D 00	2.5420D-01	-1.3696D 00
3.2	7.8072D-02	6.0967D-01	1.1632D 00	2.5501D 00	3.1159D-01	-1.1661D 00
3.4	7.2954D-02	6.9397D-01	1.2238D 00	2.6179D 00	3.6600D-01	-1.0051D 00
3.6	6.7451D-02	7.8196D-01	1.2809D 00	2.6963D 00	4.1778D-01	-8.7281D-01
3.8	6.1736D-02	8.7288D-01	1.3350D 00	2.7849D 00	4.6721D-01	-7.6097D-01
4.0	5.5962D-02	9.6590D-01	1.3863D 00	2.8831D 00	5.1452D-01	-6.6453D-01
4.2	5.0259D-02	1.0602D 00	1.4351D 00	2.9906D 00	5.5985D-01	-5.8008D-01
4.4	4.4739D-02	1.1548D 00	1.4816D 00	3.1069D 00	6.0335D-01	-5.0526D-01
4.6	3.9487D-02	1.2488D 00	1.5261D 00	3.2318D 00	6.4509D-01	-4.3836D-01
4.8	3.4568D-02	1.3414D 00	1.5686D 00	3.3648D 00	6.8517D-01	-3.7809D-01
5.0	3.0025D-02	1.4318D 00	1.6094D 00	3.5057D 00	7.2362D-01	-3.2349D-01
5.2	2.5883D-02	1.5192D 00	1.6487D 00	3.6542D 00	7.6049D-01	-2.7379D-01
5.4	2.2152D-02	1.6029D 00	1.6864D 00	3.8098D 00	7.9581D-01	-2.2839D-01
5.6	1.8828D-02	1.6823D 00	1.7228D 00	3.9724D 00	8.2961D-01	-1.8680D-01
5.8	1.5898D-02	1.7570D 00	1.7579D 00	4.1416D 00	8.6190D-01	-1.4862D-01
6.0	1.3339D-02	1.8265D 00	1.7918D 00	4.3171D 00	8.9270D-01	-1.1350D-01
6.2	1.1125D-02	1.8907D 00	1.8245D 00	4.4986D 00	9.2203D-01	-8.1181D-02
6.4	9.2256D-03	1.9492D 00	1.8563D 00	4.6858D 00	9.4990D-01	-5.1402D-02
6.6	7.6090D-03	2.0022D 00	1.8871D 00	4.8784D 00	9.7633D-01	-2.3954D-02
6.8	6.2435D-03	2.0496D 00	1.9169D 00	5.0762D 00	1.0014D 00	1.3496D-03
7.0	5.0982D-03	2.0916D 00	1.9459D 00	5.2789D 00	1.0250D 00	2.4679D-02

7.2	4.1439D-03	2.1283D 00	1.9741D 00	5.4861D 00	1.0473D 00	4.6189D-02
7.4	3.3537D-03	2.1600D 00	2.0015D 00	5.6977D 00	1.0683D 00	6.6022D-02
7.6	2.7032D-03	2.1871D 00	2.0281D 00	5.9133D 00	1.0880D 00	8.4310D-02
7.8	2.1705D-03	2.2099D 00	2.0541D 00	6.1328D 00	1.1065D 00	1.0118D-01
8.0	1.7366D-03	2.2288D 00	2.0794D 00	6.3558D 00	1.1238D 00	1.1674D-01
8.2	1.3847D-03	2.2441D 00	2.1041D 00	6.5823D 00	1.1401D 00	1.3112D-01
8.4	1.1007D-03	2.2563D 00	2.1282D 00	6.8118D 00	1.1554D 00	1.4442D-01
8.6	8.7233D-04	2.2656D 00	2.1518D 00	7.0443D 00	1.1697D 00	1.5673D-01
8.8	6.8944D-04	2.2725D 00	2.1748D 00	7.2796D 00	1.1831D 00	1.6816D-01
9.0	5.4347D-04	2.2772D 00	2.1972D 00	7.5175D 00	1.1958D 00	1.7880D-01
9.2	4.2735D-04	2.2802D 00	2.2192D 00	7.7579D 00	1.2077D 00	1.8874D-01
9.4	3.3527D-04	2.2816D 00	2.2407D 00	8.0006D 00	1.2190D 00	1.9804D-01
9.6	2.6245D-04	2.2817D 00	2.2618D 00	8.2455D 00	1.2297D 00	2.0679D-01
9.8	2.0501D-04	2.2808D 00	2.2824D 00	8.4924D 00	1.2399D 00	2.1506D-01
10.0	1.5983D-04	2.2790D 00	2.3026D 00	8.7414D 00	1.2497D 00	2.2290D-01
10.2	1.2436D-04	2.2765D 00	2.3224D 00	8.9923D 00	1.2591D 00	2.3037D-01
10.4	9.6592D-05	2.2735D 00	2.3418D 00	9.2450D 00	1.2681D 00	2.3751D-01
10.6	7.4889D-05	2.2700D 00	2.3609D 00	9.4995D 00	1.2768D 00	2.4438D-01
10.8	5.7962D-05	2.2661D 00	2.3795D 00	9.7557D 00	1.2853D 00	2.5100D-01
11.0	4.4786D-05	2.2621D 00	2.3979D 00	1.0014D 01	1.2936D 00	2.5741D-01
11.2	3.4549D-05	2.2578D 00	2.4159D 00	1.0273D 01	1.3017D 00	2.6364D-01
11.4	2.6609D-05	2.2534D 00	2.4336D 00	1.0534D 01	1.3096D 00	2.6970D-01
11.6	2.0461D-05	2.2488D 00	2.4510D 00	1.0797D 01	1.3174D 00	2.7562D-01
11.8	1.5710D-05	2.2443D 00	2.4681D 00	1.1061D 01	1.3250D 00	2.8142D-01
12.0	1.2044D-05	2.2397D 00	2.4849D 00	1.1327D 01	1.3326D 00	2.8710D-01
12.2	9.2192D-06	2.2350D 00	2.5014D 00	1.1594D 01	1.3400D 00	2.9267D-01
12.4	7.0467D-06	2.2304D 00	2.5177D 00	1.1863D 01	1.3474D 00	2.9815D-01
12.6	5.3782D-06	2.2258D 00	2.5337D 00	1.2133D 01	1.3547D 00	3.0355D-01
12.8	4.0988D-06	2.2212D 00	2.5494D 00	1.2405D 01	1.3619D 00	3.0886D-01
13.0	3.1193D-06	2.2167D 00	2.5649D 00	1.2678D 01	1.3690D 00	3.1409D-01
13.2	2.3705D-06	2.2121D 00	2.5802D 00	1.2952D 01	1.3761D 00	3.1925D-01
13.4	1.7989D-06	2.2077D 00	2.5953D 00	1.3228D 01	1.3831D 00	3.2434D-01
13.6	1.3632D-06	2.2032D 00	2.6101D 00	1.3506D 01	1.3901D 00	3.2937D-01
13.8	1.0316D-06	2.1988D 00	2.6247D 00	1.3784D 01	1.3970D 00	3.3433D-01
14.0	7.7962D-07	2.1945D 00	2.6391D 00	1.4064D 01	1.4039D 00	3.3922D-01
14.2	5.8837D-07	2.1902D 00	2.6532D 00	1.4346D 01	1.4107D 00	3.4406D-01
14.4	4.4343D-07	2.1859D 00	2.6672D 00	1.4629D 01	1.4174D 00	3.4884D-01
14.6	3.3375D-07	2.1817D 00	2.6810D 00	1.4913D 01	1.4241D 00	3.5355D-01
14.8	2.5086D-07	2.1775D 00	2.6946D 00	1.5198D 01	1.4308D 00	3.5822D-01
15.0	1.8831D-07	2.1734D 00	2.7081D 00	1.5485D 01	1.4374D 00	3.6282D-01

TABLE 17
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 0.2

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	4.1705D-03	2.6152D-04	-1.6094D 00	5.4797D 00	-4.9821D 00	1.6059D 00
0.4	8.2964D-03	9.5708D-04	-9.1629D-01	4.7919D 00	-2.4643D 00	9.0190D-01
0.6	1.2334D-02	1.9325D-03	-5.1083D-01	4.3954D 00	-1.6131D 00	4.7816D-01
0.8	1.6241D-02	3.0985D-03	-2.2314D-01	4.1202D 00	-1.1786D 00	1.6433D-01
1.0	1.9978D-02	4.4054D-03	0.0	3.9131D 00	-9.1076D-01	-9.3476D-02
1.2	2.3507D-02	5.8252D-03	1.8232D-01	3.7504D 00	-7.2626D-01	-3.1984D-01
1.4	2.6796D-02	7.3422D-03	3.3647D-01	3.6195D 00	-5.8940D-01	-5.2866D-01
1.6	2.9816D-02	8.9483D-03	4.7000D-01	3.5127D 00	-4.8230D-01	-7.2918D-01
1.8	3.2541D-02	1.0640D-02	5.8779D-01	3.4253D 00	-3.9506D-01	-9.2871D-01
2.0	3.4952D-02	1.2415D-02	6.9315D-01	3.3538D 00	-3.2173D-01	-1.1340D 00
2.2	3.7035D-02	1.4276D-02	7.8846D-01	3.2959D 00	-2.5851D-01	-1.3528D 00
2.4	3.8780D-02	1.6224D-02	8.7547D-01	3.2499D 00	-2.0289D-01	-1.5951D 00
2.6	4.0182D-02	1.8261D-02	9.5551D-01	3.2143D 00	-1.5312D-01	-1.8765D 00
2.8	4.1242D-02	2.0389D-02	1.0296D 00	3.1883D 00	-1.0795D-01	-2.2261D 00
3.0	4.1965D-02	2.2613D-02	1.0986D 00	3.1709D 00	-6.6461D-02	-2.7111D 00
3.2	4.2361D-02	2.4933D-02	1.1632D 00	3.1615D 00	-2.7979D-02	-3.5763D 00
3.4	4.2444D-02	2.7353D-02	1.2238D 00	3.1596D 00	8.0230D-03	-4.8254D 00
3.6	4.2231D-02	2.9876D-02	1.2809D 00	3.1646D 00	4.1953D-02	-3.1712D 00
3.8	4.1743D-02	3.2502D-02	1.3350D 00	3.1762D 00	7.4130D-02	-2.6019D 00
4.0	4.1002D-02	3.5234D-02	1.3863D 00	3.1941D 00	1.0481D-01	-2.2556D 00
4.2	4.0032D-02	3.8072D-02	1.4351D 00	3.2181D 00	1.3420D-01	-2.0084D 00
4.4	3.8862D-02	4.1017D-02	1.4816D 00	3.2477D 00	1.6247D-01	-1.8173D 00
4.6	3.7516D-02	4.4070D-02	1.5261D 00	3.2830D 00	1.8976D-01	-1.6620D 00
4.8	3.6023D-02	4.7229D-02	1.5686D 00	3.3236D 00	2.1618D-01	-1.5317D 00
5.0	3.4410D-02	5.0494D-02	1.6094D 00	3.3694D 00	2.4182D-01	-1.4195D 00
5.2	3.2703D-02	5.3862D-02	1.6487D 00	3.4203D 00	2.6678D-01	-1.3213D 00
5.4	3.0928D-02	5.7333D-02	1.6864D 00	3.4761D 00	2.9112D-01	-1.2340D 00
5.6	2.9110D-02	6.0901D-02	1.7228D 00	3.5367D 00	3.1490D-01	-1.1555D 00
5.8	2.7269D-02	6.4565D-02	1.7579D 00	3.6020D 00	3.3816D-01	-1.0842D 00
6.0	2.5428D-02	6.8320D-02	1.7918D 00	3.6719D 00	3.6095D-01	-1.0190D 00
6.2	2.3604D-02	7.2161D-02	1.8245D 00	3.7464D 00	3.8332D-01	-9.5890D-01
6.4	2.1814D-02	7.6082D-02	1.8563D 00	3.8252D 00	4.0528D-01	-9.0319D-01
6.6	2.0072D-02	8.0077D-02	1.8871D 00	3.9084D 00	4.2686D-01	-8.5130D-01
6.8	1.8390D-02	8.4138D-02	1.9169D 00	3.9959D 00	4.4810D-01	-8.0274D-01
7.0	1.6778D-02	8.8260D-02	1.9459D 00	4.0877D 00	4.6901D-01	-7.5714D-01

7.2	1.5245D-02	9.2433D-02	1.9741D 00	4.1835D 00	4.8960D-01	-7.1416D-01
7.4	1.3795D-02	9.6648D-02	2.0015D 00	4.2835D 00	5.0990D-01	-6.7353D-01
7.6	1.2432D-02	1.0090D-01	2.0281D 00	4.3875D 00	5.2992D-01	-6.3502D-01
7.8	1.1160D-02	1.0517D-01	2.0541D 00	4.4954D 00	5.4967D-01	-5.9843D-01
8.0	9.9785D-03	1.0946D-01	2.0794D 00	4.6073D 00	5.6916D-01	-5.6359D-01
8.2	8.8878D-03	1.1375D-01	2.1041D 00	4.7231D 00	5.8840D-01	-5.3035D-01
8.4	7.8860D-03	1.1803D-01	2.1282D 00	4.8427D 00	6.0739D-01	-4.9858D-01
8.6	6.9708D-03	1.2230D-01	2.1518D 00	4.9660D 00	6.2615D-01	-4.6817D-01
8.8	6.1389D-03	1.2654D-01	2.1748D 00	5.0931D 00	6.4467D-01	-4.3902D-01
9.0	5.3864D-03	1.3073D-01	2.1972D 00	5.2239D 00	6.6296D-01	-4.1104D-01
9.2	4.7090D-03	1.3488D-01	2.2192D 00	5.3583D 00	6.8103D-01	-3.8415D-01
9.4	4.1020D-03	1.3896D-01	2.2407D 00	5.4963D 00	6.9888D-01	-3.5828D-01
9.6	3.5606D-03	1.4297D-01	2.2618D 00	5.6378D 00	7.1650D-01	-3.3337D-01
9.8	3.0799D-03	1.4690D-01	2.2824D 00	5.7829D 00	7.3391D-01	-3.0937D-01
10.0	2.6549D-03	1.5073D-01	2.3026D 00	5.9314D 00	7.5110D-01	-2.8622D-01
10.2	2.2807D-03	1.5446D-01	2.3224D 00	6.0833D 00	7.6807D-01	-2.6388D-01
10.4	1.9526D-03	1.5807D-01	2.3418D 00	6.2386D 00	7.8482D-01	-2.4230D-01
10.6	1.6662D-03	1.6156D-01	2.3609D 00	6.3972D 00	8.0136D-01	-2.2144D-01
10.8	1.4172D-03	1.6492D-01	2.3795D 00	6.5591D 00	8.1768D-01	-2.0129D-01
11.0	1.2014D-03	1.6815D-01	2.3979D 00	6.7243D 00	8.3378D-01	-1.8179D-01
11.2	1.0153D-03	1.7122D-01	2.4159D 00	6.8926D 00	8.4966D-01	-1.6292D-01
11.4	8.5526D-04	1.7414D-01	2.4336D 00	7.0641D 00	8.6532D-01	-1.4466D-01
11.6	7.1824D-04	1.7691D-01	2.4510D 00	7.2387D 00	8.8075D-01	-1.2698D-01
11.8	6.0132D-04	1.7951D-01	2.4681D 00	7.4164D 00	8.9596D-01	-1.0986D-01
12.0	5.0191D-04	1.8195D-01	2.4849D 00	7.5971D 00	9.1094D-01	-9.3275D-02
12.2	4.1770D-04	1.8421D-01	2.5014D 00	7.7807D 00	9.2570D-01	-7.7209D-02
12.4	3.4660D-04	1.8631D-01	2.5177D 00	7.9673D 00	9.4022D-01	-6.1641D-02
12.6	2.8677D-04	1.8823D-01	2.5337D 00	8.1568D 00	9.5451D-01	-4.6555D-02
12.8	2.3660D-04	1.8997D-01	2.5494D 00	8.3491D 00	9.6857D-01	-3.1935D-02
13.0	1.9466D-04	1.9155D-01	2.5649D 00	8.5442D 00	9.8239D-01	-1.7766D-02
13.2	1.5972D-04	1.9295D-01	2.5802D 00	8.7421D 00	9.9597D-01	-4.0336D-03
13.4	1.3070D-04	1.9418D-01	2.5953D 00	8.9426D 00	1.0093D 00	9.2763D-03
13.6	1.0667D-04	1.9525D-01	2.6101D 00	9.1458D 00	1.0224D 00	2.2176D-02
13.8	8.6830D-05	1.9615D-01	2.6247D 00	9.3516D 00	1.0353D 00	3.4679D-02
14.0	7.0501D-05	1.9688D-01	2.6391D 00	9.5599D 00	1.0479D 00	4.6796D-02
14.2	5.7100D-05	1.9747D-01	2.6532D 00	9.7707D 00	1.0603D 00	5.8540D-02
14.4	4.6133D-05	1.9790D-01	2.6672D 00	9.9840D 00	1.0724D 00	6.9921D-02
14.6	3.7183D-05	1.9819D-01	2.6810D 00	1.0200D 01	1.0843D 00	8.0949D-02
14.8	2.9899D-05	1.9833D-01	2.6946D 00	1.0418D 01	1.0960D 00	9.1637D-02
15.0	2.3986D-05	1.9835D-01	2.7081D 00	1.0638D 01	1.1074D 00	1.0199D-01

TABLE 18
AVERAGE SECTION INTEGRAL AND RELATED QUANTITIES
VS. G FOR β = 0.1

G	$\bar{C}$	$\bar{A}$	LOG(G)	$\bar{\Phi}$	$\bar{\Phi}'$	LOG($\lvert\bar{\Phi}'\rvert$)
0.2	1.6091D-03	5.1190D-05	-1.6094D 00	6.4321D 00	-4.9906D 00	1.6076D 00
0.4	3.2091D-03	1.2607D-04	-9.1629D-01	5.7418D 00	-2.4812D 00	9.0876D-01
0.6	4.7912D-03	1.8299D-04	-5.1083D-01	5.3410D 00	-1.6385D 00	4.9380D-01
0.8	6.3464D-03	2.1900D-04	-2.2314D-01	5.0599D 00	-1.2125D 00	1.9268D-01
1.0	7.8664D-03	2.3849D-04	0.0	4.8452D 00	-9.5311D-01	-4.8020D-02
1.2	9.3428D-03	2.4630D-04	1.8232D-01	4.6732D 00	-7.7707D-01	-2.5222D-01
1.4	1.0768D-02	2.4628D-04	3.3647D-01	4.5312D 00	-6.4865D-01	-4.3286D-01
1.6	1.2134D-02	2.4124D-04	4.7000D-01	4.4117D 00	-5.4999D-01	-5.9785D-01
1.8	1.3435D-02	2.3312D-04	5.8779D-01	4.3099D 00	-4.7118D-01	-7.5253D-01
2.0	1.4664D-02	2.2326D-04	6.9315D-01	4.2223D 00	-4.0625D-01	-9.0079D-01
2.2	1.5816D-02	2.1253D-04	7.8846D-01	4.1467D 00	-3.5143D-01	-1.0458D 00
2.4	1.6886D-02	2.0153D-04	8.7547D-01	4.0813D 00	-3.0418D-01	-1.1901D 00
2.6	1.7870D-02	1.9063D-04	9.5551D-01	4.0247D 00	-2.6276D-01	-1.3365D 00
2.8	1.8763D-02	1.8007D-04	1.0296D 00	3.9759D 00	-2.2593D-01	-1.4875D 00
3.0	1.9565D-02	1.6999D-04	1.0986D 00	3.9340D 00	-1.9276D-01	-1.6463D 00
3.2	2.0271D-02	1.6046D-04	1.1632D 00	3.8986D 00	-1.6256D-01	-1.8167D 00
3.4	2.0882D-02	1.5152D-04	1.2238D 00	3.8688D 00	-1.3482D-01	-2.0038D 00
3.6	2.1397D-02	1.4317D-04	1.2809D 00	3.8445D 00	-1.0913D-01	-2.2152D 00
3.8	2.1817D-02	1.3541D-04	1.3350D 00	3.8251D 00	-8.5160D-02	-2.4632D 00
4.0	2.2141D-02	1.2820D-04	1.3863D 00	3.8103D 00	-6.2654D-02	-2.7701D 00
4.2	2.2372D-02	1.2152D-04	1.4351D 00	3.7999D 00	-4.1405D-02	-3.1844D 00
4.4	2.2512D-02	1.1533D-04	1.4816D 00	3.7937D 00	-2.1241D-02	-3.8518D 00
4.6	2.2564D-02	1.0960D-04	1.5261D 00	3.7914D 00	-2.0219D-03	-6.2037D 00
4.8	2.2532D-02	1.0430D-04	1.5686D 00	3.7928D 00	1.6370D-02	-4.1123D 00
5.0	2.2418D-02	9.9399D-05	1.6094D 00	3.7979D 00	3.4033D-02	-3.3804D 00
5.2	2.2228D-02	9.4857D-05	1.6487D 00	3.8064D 00	5.1052D-02	-2.9749D 00
5.4	2.1966D-02	9.0650D-05	1.6864D 00	3.8183D 00	6.7496D-02	-2.6957D 00
5.6	2.1637D-02	8.6749D-05	1.7228D 00	3.8334D 00	8.3427D-02	-2.4838D 00
5.8	2.1246D-02	8.3130D-05	1.7579D 00	3.8516D 00	9.8897D-02	-2.3137D 00
6.0	2.0798D-02	7.9769D-05	1.7918D 00	3.8729D 00	1.1395D-01	-2.1720D 00
6.2	2.0300D-02	7.6646D-05	1.8245D 00	3.8972D 00	1.2863D-01	-2.0508D 00
6.4	1.9756D-02	7.3741D-05	1.8563D 00	3.9243D 00	1.4297D-01	-1.9451D 00
6.6	1.9172D-02	7.1036D-05	1.8871D 00	3.9543D 00	1.5700D-01	-1.8515D 00
6.8	1.8553D-02	6.8515D-05	1.9169D 00	3.9871D 00	1.7074D-01	-1.7676D 00
7.0	1.7906D-02	6.6163D-05	1.9459D 00	4.0226D 00	1.8422D-01	-1.6916D 00

7.2	1.7236D-02	6.3966D-05	1.9741D 00	4.0608D 00	1.9746D-01	-1.6222D 00
7.4	1.6547D-02	6.1913D-05	2.0015D 00	4.1016D 00	2.1049D-01	-1.5583D 00
7.6	1.5844D-02	5.9991D-05	2.0281D 00	4.1450D 00	2.2330D-01	-1.4992D 00
7.8	1.5133D-02	5.8191D-05	2.0541D 00	4.1909D 00	2.3593D-01	-1.4442D 00
8.0	1.4417D-02	5.6503D-05	2.0794D 00	4.2393D 00	2.4839D-01	-1.3928D 00
8.2	1.3702D-02	5.4919D-05	2.1041D 00	4.2902D 00	2.6068D-01	-1.3445D 00
8.4	1.2990D-02	5.3431D-05	2.1282D 00	4.3436D 00	2.7281D-01	-1.2990D 00
8.6	1.2285D-02	5.2032D-05	2.1518D 00	4.3993D 00	2.8481D-01	-1.2559D 00
8.8	1.1591D-02	5.0715D-05	2.1748D 00	4.4575D 00	2.9667D-01	-1.2151D 00
9.0	1.0911D-02	4.9473D-05	2.1972D 00	4.5180D 00	3.0840D-01	-1.1763D 00
9.2	1.0246D-02	4.8303D-05	2.2192D 00	4.5808D 00	3.2002D-01	-1.1394D 00
9.4	9.5999D-03	4.7198D-05	2.2407D 00	4.6460D 00	3.3153D-01	-1.1040D 00
9.6	8.9738D-03	4.6153D-05	2.2618D 00	4.7134D 00	3.4293D-01	-1.0702D 00
9.8	8.3695D-03	4.5165D-05	2.2824D 00	4.7832D 00	3.5423D-01	-1.0378D 00
10.0	7.7883D-03	4.4230D-05	2.3026D 00	4.8551D 00	3.6544D-01	-1.0067D 00
10.2	7.2313D-03	4.3344D-05	2.3224D 00	4.9293D 00	3.7655D-01	-9.7670D-01
10.4	6.6993D-03	4.2503D-05	2.3418D 00	5.0057D 00	3.8758D-01	-9.4782D-01
10.6	6.1929D-03	4.1704D-05	2.3609D 00	5.0844D 00	3.9853D-01	-9.1996D-01
10.8	5.7122D-03	4.0945D-05	2.3795D 00	5.1652D 00	4.0941D-01	-8.9305D-01
11.0	5.2574D-03	4.0223D-05	2.3979D 00	5.2481D 00	4.2020D-01	-8.6701D-01
11.2	4.8284D-03	3.9535D-05	2.4159D 00	5.3332D 00	4.3093D-01	-8.4181D-01
11.4	4.4250D-03	3.8880D-05	2.4336D 00	5.4205D 00	4.4159D-01	-8.1737D-01
11.6	4.0467D-03	3.8254D-05	2.4510D 00	5.5099D 00	4.5218D-01	-7.9367D-01
11.8	3.6929D-03	3.7656D-05	2.4681D 00	5.6014D 00	4.6271D-01	-7.7065D-01
12.0	3.3629D-03	3.7084D-05	2.4849D 00	5.6949D 00	4.7318D-01	-7.4828D-01
12.2	3.0561D-03	3.6536D-05	2.5014D 00	5.7906D 00	4.8359D-01	-7.2652D-01
12.4	2.7715D-03	3.6012D-05	2.5177D 00	5.8884D 00	4.9394D-01	-7.0534D-01
12.6	2.5082D-03	3.5508D-05	2.5337D 00	5.9882D 00	5.0424D-01	-6.8471D-01
12.8	2.2653D-03	3.5024D-05	2.5494D 00	6.0901D 00	5.1448D-01	-6.6460D-01
13.0	2.0417D-03	3.4559D-05	2.5649D 00	6.1940D 00	5.2467D-01	-6.4498D-01
13.2	1.8364D-03	3.4111D-05	2.5802D 00	6.2999D 00	5.3481D-01	-6.2584D-01
13.4	1.6485D-03	3.3679D-05	2.5953D 00	6.4079D 00	5.4490D-01	-6.0715D-01
13.6	1.4768D-03	3.3262D-05	2.6101D 00	6.5179D 00	5.5494D-01	-5.8889D-01
13.8	1.3203D-03	3.2859D-05	2.6247D 00	6.6299D 00	5.6494D-01	-5.7104D-01
14.0	1.1781D-03	3.2470D-05	2.6391D 00	6.7439D 00	5.7488D-01	-5.5359D-01
14.2	1.0491D-03	3.2092D-05	2.6532D 00	6.8598D 00	5.8479D-01	-5.3651D-01
14.4	9.3238D-04	3.1725D-05	2.6672D 00	6.9778D 00	5.9464D-01	-5.1979D-01
14.6	8.2702D-04	3.1370D-05	2.6810D 00	7.0977D 00	6.0446D-01	-5.0343D-01
14.8	7.3213D-04	3.1023D-05	2.6946D 00	7.2196D 00	6.1423D-01	-4.8739D-01
15.0	6.4687D-04	3.0686D-05	2.7081D 00	7.3434D 00	6.2395D-01	-4.7168D-01

TABLE 19

TABLES FOR RATIOS OF GRAIN BOUNDARY CONCENTRATIONS

$\beta G^{-2/3}$ LOG((C(G,β)/C(G,∞)) VS. G AND β

G\β	100	10	5	2	1	1/2	2/10	1/10
0.2	1.642D 00	8.488D-01	6.108D-01	3.658D-01	2.342D-01	1.428D-01	6.917D-02	3.823D-02
0.4	1.169D 00	8.832D-01	6.881D-01	4.401D-01	2.898D-01	1.794D-01	8.780D-02	4.868D-02
0.6	9.425D-01	8.383D-01	7.024D-01	4.800D-01	3.254D-01	2.048D-01	1.012D-01	5.628D-02
0.8	8.183D-01	7.761D-01	6.900D-01	5.025D-01	3.509D-01	2.246D-01	1.121D-01	6.254D-02
1.0	7.395D-01	7.181D-01	6.662D-01	5.144D-01	3.699D-01	2.409D-01	1.215D-01	6.799D-02
1.2	6.847D-01	6.702D-01	6.388D-01	5.191D-01	3.844D-01	2.547D-01	1.299D-01	7.289D-02
1.4	6.444D-01	6.325D-01	6.122D-01	5.190D-01	3.955D-01	2.665D-01	1.374D-01	7.738D-02
1.6	6.135D-01	6.028D-01	5.881D-01	5.158D-01	4.038D-01	2.771D-01	1.444D-01	8.156D-02
1.8	5.890D-01	5.792D-01	5.673D-01	5.104D-01	4.100D-01	2.863D-01	1.508D-01	8.548D-02
2.0	5.692D-01	5.600D-01	5.496D-01	5.039D-01	4.144D-01	2.944D-01	1.568D-01	8.920D-02
2.2	5.528D-01	5.442D-01	5.346D-01	4.968D-01	4.174D-01	3.017D-01	1.625D-01	9.274D-02
2.4	5.390D-01	5.309D-01	5.219D-01	4.896D-01	4.192D-01	3.081D-01	1.679D-01	9.612D-02
2.6	5.273D-01	5.196D-01	5.111D-01	4.826D-01	4.201D-01	3.139D-01	1.730D-01	9.937D-02
2.8	5.172D-01	5.098D-01	5.018D-01	4.760D-01	4.202D-01	3.190D-01	1.778D-01	1.025D-01
3.0	5.084D-01	5.014D-01	4.937D-01	4.698D-01	4.198D-01	3.235D-01	1.824D-01	1.055D-01
3.2	5.007D-01	4.940D-01	4.866D-01	4.642D-01	4.190D-01	3.276D-01	1.868D-01	1.085D-01
3.4	4.939D-01	4.874D-01	4.803D-01	4.591D-01	4.178D-01	3.312D-01	1.911D-01	1.113D-01
3.6	4.878D-01	4.816D-01	4.748D-01	4.544D-01	4.164D-01	3.344D-01	1.951D-01	1.141D-01
3.8	4.824D-01	4.764D-01	4.698D-01	4.502D-01	4.149D-01	3.372D-01	1.990D-01	1.168D-01
4.0	4.776D-01	4.717D-01	4.653D-01	4.465D-01	4.133D-01	3.397D-01	2.027D-01	1.194D-01
4.2	4.732D-01	4.675D-01	4.613D-01	4.430D-01	4.117D-01	3.419D-01	2.063D-01	1.219D-01
4.4	4.692D-01	4.637D-01	4.577D-01	4.399D-01	4.100D-01	3.438D-01	2.098D-01	1.244D-01
4.6	4.655D-01	4.602D-01	4.544D-01	4.371D-01	4.085D-01	3.455D-01	2.131D-01	1.268D-01
4.8	4.622D-01	4.570D-01	4.513D-01	4.346D-01	4.070D-01	3.469D-01	2.163D-01	1.292D-01
5.0	4.591D-01	4.541D-01	4.486D-01	4.322D-01	4.055D-01	3.482D-01	2.194D-01	1.316D-01
5.2	4.563D-01	4.514D-01	4.460D-01	4.301D-01	4.042D-01	3.493D-01	2.224D-01	1.338D-01
5.4	4.537D-01	4.489D-01	4.437D-01	4.281D-01	4.029D-01	3.503D-01	2.252D-01	1.361D-01
5.6	4.513D-01	4.467D-01	4.415D-01	4.263D-01	4.017D-01	3.511D-01	2.280D-01	1.383D-01
5.8	4.491D-01	4.445D-01	4.395D-01	4.246D-01	4.006D-01	3.518D-01	2.307D-01	1.404D-01
6.0	4.470D-01	4.426D-01	4.376D-01	4.231D-01	3.996D-01	3.524D-01	2.333D-01	1.425D-01
6.2	4.451D-01	4.407D-01	4.359D-01	4.217D-01	3.987D-01	3.529D-01	2.358D-01	1.446D-01
6.4	4.433D-01	4.390D-01	4.343D-01	4.203D-01	3.978D-01	3.534D-01	2.382D-01	1.466D-01
6.6	4.416D-01	4.374D-01	4.328D-01	4.191D-01	3.970D-01	3.538D-01	2.405D-01	1.486D-01
6.8	4.400D-01	4.359D-01	4.313D-01	4.179D-01	3.962D-01	3.541D-01	2.428D-01	1.505D-01
7.0	4.385D-01	4.345D-01	4.300D-01	4.168D-01	3.955D-01	3.544D-01	2.450D-01	1.524D-01

7.2	4.371D-01	4.331D-01	4.287D-01	4.158D-01	3.949D-01	3.547D-01	2.471D-01	1.543D-01
7.4	4.358D-01	4.319D-01	4.276D-01	4.149D-01	3.943D-01	3.549D-01	2.491D-01	1.562D-01
7.6	4.345D-01	4.307D-01	4.265D-01	4.140D-01	3.938D-01	3.551D-01	2.511D-01	1.580D-01
7.8	4.333D-01	4.296D-01	4.254D-01	4.131D-01	3.932D-01	3.553D-01	2.530D-01	1.598D-01
8.0	4.322D-01	4.285D-01	4.244D-01	4.123D-01	3.928D-01	3.555D-01	2.548D-01	1.615D-01
8.2	4.311D-01	4.275D-01	4.235D-01	4.116D-01	3.923D-01	3.556D-01	2.566D-01	1.633D-01
8.4	4.301D-01	4.266D-01	4.226D-01	4.109D-01	3.919D-01	3.558D-01	2.584D-01	1.650D-01
8.6	4.292D-01	4.257D-01	4.218D-01	4.102D-01	3.915D-01	3.560D-01	2.600D-01	1.667D-01
8.8	4.283D-01	4.248D-01	4.210D-01	4.096D-01	3.912D-01	3.561D-01	2.616D-01	1.683D-01
9.0	4.274D-01	4.240D-01	4.202D-01	4.090D-01	3.908D-01	3.563D-01	2.632D-01	1.699D-01
9.2	4.266D-01	4.232D-01	4.195D-01	4.084D-01	3.905D-01	3.564D-01	2.647D-01	1.715D-01
9.4	4.258D-01	4.225D-01	4.188D-01	4.079D-01	3.902D-01	3.566D-01	2.662D-01	1.731D-01
9.6	4.250D-01	4.218D-01	4.181D-01	4.074D-01	3.899D-01	3.567D-01	2.676D-01	1.746D-01
9.8	4.243D-01	4.211D-01	4.175D-01	4.069D-01	3.897D-01	3.569D-01	2.690D-01	1.762D-01
10.0	4.236D-01	4.204D-01	4.169D-01	4.064D-01	3.894D-01	3.571D-01	2.703D-01	1.777D-01
10.2	4.230D-01	4.198D-01	4.163D-01	4.060D-01	3.892D-01	3.572D-01	2.716D-01	1.792D-01
10.4	4.223D-01	4.192D-01	4.158D-01	4.056D-01	3.890D-01	3.574D-01	2.728D-01	1.806D-01
10.6	4.217D-01	4.187D-01	4.153D-01	4.052D-01	3.888D-01	3.576D-01	2.741D-01	1.820D-01
10.8	4.212D-01	4.181D-01	4.148D-01	4.048D-01	3.886D-01	3.577D-01	2.752D-01	1.835D-01
11.0	4.206D-01	4.176D-01	4.143D-01	4.045D-01	3.884D-01	3.579D-01	2.764D-01	1.849D-01
11.2	4.201D-01	4.171D-01	4.138D-01	4.041D-01	3.883D-01	3.580D-01	2.775D-01	1.862D-01
11.4	4.196D-01	4.166D-01	4.134D-01	4.038D-01	3.881D-01	3.582D-01	2.785D-01	1.876D-01
11.6	4.191D-01	4.162D-01	4.130D-01	4.035D-01	3.880D-01	3.584D-01	2.796D-01	1.889D-01
11.8	4.186D-01	4.157D-01	4.126D-01	4.032D-01	3.878D-01	3.585D-01	2.806D-01	1.902D-01
12.0	4.181D-01	4.153D-01	4.122D-01	4.029D-01	3.877D-01	3.587D-01	2.816D-01	1.915D-01
12.2	4.177D-01	4.149D-01	4.118D-01	4.026D-01	3.876D-01	3.589D-01	2.825D-01	1.928D-01
12.4	4.173D-01	4.145D-01	4.114D-01	4.023D-01	3.875D-01	3.590D-01	2.835D-01	1.941D-01
12.6	4.168D-01	4.141D-01	4.111D-01	4.021D-01	3.874D-01	3.592D-01	2.844D-01	1.953D-01
12.8	4.164D-01	4.137D-01	4.107D-01	4.018D-01	3.873D-01	3.594D-01	2.853D-01	1.965D-01
13.0	4.161D-01	4.134D-01	4.104D-01	4.016D-01	3.872D-01	3.595D-01	2.861D-01	1.977D-01
13.2	4.157D-01	4.130D-01	4.101D-01	4.013D-01	3.871D-01	3.597D-01	2.869D-01	1.989D-01
13.4	4.153D-01	4.127D-01	4.098D-01	4.011D-01	3.870D-01	3.599D-01	2.878D-01	2.001D-01
13.6	4.150D-01	4.124D-01	4.095D-01	4.009D-01	3.869D-01	3.600D-01	2.886D-01	2.012D-01
13.8	4.146D-01	4.121D-01	4.092D-01	4.007D-01	3.868D-01	3.602D-01	2.893D-01	2.024D-01
14.0	4.143D-01	4.118D-01	4.089D-01	4.005D-01	3.868D-01	3.604D-01	2.901D-01	2.035D-01
14.2	4.140D-01	4.115D-01	4.087D-01	4.003D-01	3.867D-01	3.605D-01	2.908D-01	2.046D-01
14.4	4.137D-01	4.112D-01	4.084D-01	4.001D-01	3.866D-01	3.607D-01	2.915D-01	2.057D-01
14.6	4.134D-01	4.109D-01	4.082D-01	4.000D-01	3.866D-01	3.608D-01	2.922D-01	2.068D-01
14.8	4.131D-01	4.107D-01	4.079D-01	3.998D-01	3.865D-01	3.610D-01	2.929D-01	2.079D-01
15.0	4.128D-01	4.104D-01	4.077D-01	3.996D-01	3.865D-01	3.612D-01	2.936D-01	2.089D-01

TABLE 20

TABLES FOR RATIOS OF AVERAGE SECTION INTEGRALS

$\beta G^{-2/3}$ LOG{ $(\bar{C}(G,\beta)/\bar{C}(G,\infty))$ } VS. G AND β

G\β	100	10	5	2	1	1/2	2/10	1/10
0.2	-5.909D 01	-4.101D 01	-2.815D 01	-1.598D 01	-1.006D 01	-6.192D 00	-3.160D 00	-1.858D 00
0.4	4.593D-01	-1.204D 01	-1.027D 01	-6.923D 00	-4.734D 00	-3.090D 00	-1.664D 00	-1.007D 00
0.6	1.358D 00	-3.818D 00	-4.499D 00	-3.754D 00	-2.809D 00	-1.945D 00	-1.101D 00	-6.836D-01
0.8	1.158D 00	-7.834D-01	-1.900D 00	-2.162D 00	-1.806D 00	-1.336D 00	-7.977D-01	-5.079D-01
1.0	1.026D 00	3.484D-01	-5.863D-01	-1.228D 00	-1.191D 00	-9.539D-01	-6.045D-01	-3.954D-01
1.2	9.325D-01	7.181D-01	9.654D-02	-6.328D-01	-7.766D-01	-6.905D-01	-4.693D-01	-3.163D-01
1.4	8.633D-01	7.993D-01	4.422D-01	-2.368D-01	-4.817D-01	-4.974D-01	-3.685D-01	-2.571D-01
1.6	8.097D-01	7.880D-01	6.037D-01	3.300D-02	-2.635D-01	-3.495D-01	-2.901D-01	-2.108D-01
1.8	7.668D-01	7.555D-01	6.671D-01	2.182D-01	-9.775D-02	-2.328D-01	-2.270D-01	-1.733D-01
2.0	7.316D-01	7.228D-01	6.813D-01	3.447D-01	3.040D-02	-1.384D-01	-1.749D-01	-1.421D-01
2.2	7.024D-01	6.943D-01	6.735D-01	4.297D-01	1.306D-01	-6.073D-02	-1.310D-01	-1.158D-01
2.4	6.775D-01	6.700D-01	6.575D-01	4.851D-01	2.096D-01	4.140D-03	-9.342D-02	-9.309D-02
2.6	6.562D-01	6.491D-01	6.399D-01	5.194D-01	2.719D-01	5.892D-02	-6.083D-02	-7.327D-02
2.8	6.377D-01	6.309D-01	6.230D-01	5.388D-01	3.211D-01	1.056D-01	-3.223D-02	-5.576D-02
3.0	6.216D-01	6.150D-01	6.077D-01	5.481D-01	3.598D-01	1.456D-01	-6.879D-03	-4.013D-02
3.2	6.073D-01	6.010D-01	5.940D-01	5.506D-01	3.899D-01	1.802D-01	1.577D-02	-2.606D-02
3.4	5.945D-01	5.885D-01	5.818D-01	5.487D-01	4.132D-01	2.101D-01	3.614D-02	-1.330D-02
3.6	5.832D-01	5.773D-01	5.709D-01	5.443D-01	4.308D-01	2.361D-01	5.459D-02	-1.652D-03
3.8	5.729D-01	5.673D-01	5.610D-01	5.385D-01	4.439D-01	2.588D-01	7.138D-02	9.043D-03
4.0	5.637D-01	5.582D-01	5.521D-01	5.322D-01	4.533D-01	2.786D-01	8.674D-02	1.892D-02
4.2	5.552D-01	5.499D-01	5.441D-01	5.257D-01	4.597D-01	2.958D-01	1.008D-01	2.807D-02
4.4	5.475D-01	5.424D-01	5.367D-01	5.194D-01	4.638D-01	3.109D-01	1.139D-01	3.659D-02
4.6	5.405D-01	5.355D-01	5.299D-01	5.133D-01	4.660D-01	3.240D-01	1.259D-01	4.456D-02
4.8	5.340D-01	5.291D-01	5.237D-01	5.077D-01	4.668D-01	3.354D-01	1.370D-01	5.203D-02
5.0	5.281D-01	5.233D-01	5.180D-01	5.025D-01	4.665D-01	3.453D-01	1.474D-01	5.906D-02
5.2	5.225D-01	5.179D-01	5.128D-01	4.976D-01	4.655D-01	3.538D-01	1.571D-01	6.570D-02
5.4	5.174D-01	5.129D-01	5.079D-01	4.930D-01	4.638D-01	3.612D-01	1.662D-01	7.197D-02
5.6	5.127D-01	5.082D-01	5.033D-01	4.888D-01	4.618D-01	3.676D-01	1.747D-01	7.792D-02
5.8	5.082D-01	5.039D-01	4.991D-01	4.849D-01	4.596D-01	3.729D-01	1.826D-01	8.357D-02
6.0	5.041D-01	4.998D-01	4.951D-01	4.812D-01	4.572D-01	3.775D-01	1.901D-01	8.895D-02
6.2	5.002D-01	4.960D-01	4.914D-01	4.778D-01	4.548D-01	3.813D-01	1.971D-01	9.409D-02
6.4	4.966D-01	4.925D-01	4.880D-01	4.746D-01	4.524D-01	3.845D-01	2.037D-01	9.899D-02
6.6	4.932D-01	4.891D-01	4.847D-01	4.716D-01	4.500D-01	3.871D-01	2.100D-01	1.037D-01
6.8	4.899D-01	4.860D-01	4.816D-01	4.688D-01	4.477D-01	3.892D-01	2.159D-01	1.082D-01
7.0	4.869D-01	4.830D-01	4.788D-01	4.661D-01	4.455D-01	3.909D-01	2.215D-01	1.125D-01

7.2	4.840D-01	4.802D-01	4.760D-01	4.636D-01	4.434D-01	3.922D-01	2.267D-01	1.167D-01
7.4	4.813D-01	4.776D-01	4.735D-01	4.613D-01	4.414D-01	3.931D-01	2.317D-01	1.207D-01
7.6	4.788D-01	4.751D-01	4.710D-01	4.590D-01	4.395D-01	3.938D-01	2.365D-01	1.245D-01
7.8	4.764D-01	4.727D-01	4.687D-01	4.569D-01	4.377D-01	3.942D-01	2.410D-01	1.282D-01
8.0	4.741D-01	4.705D-01	4.666D-01	4.549D-01	4.360D-01	3.945D-01	2.452D-01	1.318D-01
8.2	4.719D-01	4.684D-01	4.645D-01	4.530D-01	4.344D-01	3.945D-01	2.492D-01	1.353D-01
8.4	4.698D-01	4.663D-01	4.625D-01	4.512D-01	4.329D-01	3.944D-01	2.531D-01	1.386D-01
8.6	4.678D-01	4.644D-01	4.606D-01	4.495D-01	4.314D-01	3.942D-01	2.567D-01	1.419D-01
8.8	4.659D-01	4.626D-01	4.588D-01	4.479D-01	4.301D-01	3.939D-01	2.602D-01	1.450D-01
9.0	4.641D-01	4.608D-01	4.571D-01	4.463D-01	4.287D-01	3.936D-01	2.634D-01	1.480D-01
9.2	4.624D-01	4.591D-01	4.555D-01	4.448D-01	4.275D-01	3.931D-01	2.666D-01	1.510D-01
9.4	4.607D-01	4.575D-01	4.540D-01	4.434D-01	4.263D-01	3.927D-01	2.695D-01	1.539D-01
9.6	4.592D-01	4.560D-01	4.525D-01	4.421D-01	4.252D-01	3.922D-01	2.723D-01	1.566D-01
9.8	4.576D-01	4.545D-01	4.511D-01	4.408D-01	4.241D-01	3.917D-01	2.750D-01	1.593D-01
10.0	4.562D-01	4.531D-01	4.497D-01	4.395D-01	4.231D-01	3.912D-01	2.776D-01	1.620D-01
10.2	4.548D-01	4.518D-01	4.484D-01	4.384D-01	4.221D-01	3.907D-01	2.800D-01	1.645D-01
10.4	4.535D-01	4.505D-01	4.471D-01	4.372D-01	4.211D-01	3.902D-01	2.823D-01	1.670D-01
10.6	4.522D-01	4.492D-01	4.459D-01	4.361D-01	4.202D-01	3.897D-01	2.845D-01	1.694D-01
10.8	4.510D-01	4.480D-01	4.448D-01	4.351D-01	4.194D-01	3.892D-01	2.865D-01	1.718D-01
11.0	4.498D-01	4.469D-01	4.437D-01	4.341D-01	4.185D-01	3.887D-01	2.885D-01	1.741D-01
11.2	4.487D-01	4.458D-01	4.426D-01	4.331D-01	4.177D-01	3.883D-01	2.904D-01	1.763D-01
11.4	4.476D-01	4.447D-01	4.416D-01	4.322D-01	4.170D-01	3.878D-01	2.921D-01	1.785D-01
11.6	4.465D-01	4.437D-01	4.406D-01	4.313D-01	4.162D-01	3.874D-01	2.938D-01	1.807D-01
11.8	4.455D-01	4.427D-01	4.396D-01	4.305D-01	4.155D-01	3.870D-01	2.954D-01	1.827D-01
12.0	4.445D-01	4.417D-01	4.387D-01	4.296D-01	4.149D-01	3.866D-01	2.970D-01	1.848D-01
12.2	4.436D-01	4.408D-01	4.378D-01	4.288D-01	4.142D-01	3.862D-01	2.984D-01	1.868D-01
12.4	4.426D-01	4.399D-01	4.369D-01	4.281D-01	4.136D-01	3.859D-01	2.998D-01	1.887D-01
12.6	4.418D-01	4.391D-01	4.361D-01	4.273D-01	4.130D-01	3.855D-01	3.011D-01	1.906D-01
12.8	4.409D-01	4.382D-01	4.353D-01	4.266D-01	4.124D-01	3.852D-01	3.023D-01	1.924D-01
13.0	4.401D-01	4.374D-01	4.345D-01	4.259D-01	4.119D-01	3.849D-01	3.035D-01	1.943D-01
13.2	4.393D-01	4.367D-01	4.338D-01	4.253D-01	4.113D-01	3.846D-01	3.046D-01	1.960D-01
13.4	4.385D-01	4.359D-01	4.331D-01	4.246D-01	4.108D-01	3.843D-01	3.057D-01	1.978D-01
13.6	4.377D-01	4.352D-01	4.324D-01	4.240D-01	4.103D-01	3.841D-01	3.067D-01	1.995D-01
13.8	4.370D-01	4.345D-01	4.317D-01	4.234D-01	4.098D-01	3.838D-01	3.076D-01	2.011D-01
14.0	4.363D-01	4.338D-01	4.310D-01	4.228D-01	4.094D-01	3.836D-01	3.085D-01	2.027D-01
14.2	4.356D-01	4.331D-01	4.304D-01	4.223D-01	4.089D-01	3.833D-01	3.094D-01	2.043D-01
14.4	4.350D-01	4.325D-01	4.298D-01	4.217D-01	4.085D-01	3.831D-01	3.102D-01	2.059D-01
14.6	4.343D-01	4.319D-01	4.292D-01	4.212D-01	4.081D-01	3.829D-01	3.110D-01	2.074D-01
14.8	4.337D-01	4.313D-01	4.286D-01	4.207D-01	4.077D-01	3.827D-01	3.117D-01	2.089D-01
15.0	4.331D-01	4.307D-01	4.280D-01	4.202D-01	4.073D-01	3.825D-01	3.124D-01	2.104D-01

TABLE 21
APPROXIMATION FOR CONCENTRATION BY
TECHNIQUES OF SECTION III

G	C	$\hat{C}$	PERCENT ERROR	$\tilde{C}$	PERCENT ERROR
1.00	4.2143E-01	4.0959E-01	-2.809	3.7558E-01	-10.878
2.00	1.6285E-01	1.6728E-01	2.719	1.5665E-01	-3.806
3.00	5.8349E-02	6.0647E-02	3.939	5.7890E-02	-0.786
4.00	1.9546E-02	2.0176E-02	3.223	1.9596E-02	0.254
5.00	6.1611E-03	6.2664E-03	1.709	6.1827E-03	0.350
6.00	1.8369E-03	1.8369E-03	-0.002	1.8384E-03	0.080
7.00	5.2021E-04	5.1203E-04	-1.572	5.1910E-04	-0.213
8.00	1.4043E-04	1.3649E-04	-2.805	1.3999E-04	-0.313
9.00	3.6247E-05	3.4945E-05	-3.593	3.6216E-05	-0.086
10.00	8.9682E-06	8.6227E-06	-3.852	9.0194E-06	0.571
11.00	2.1318E-06	2.0564E-06	-3.535	2.1687E-06	1.731
12.00	4.8785E-07	4.7517E-07	-2.600	5.0468E-07	3.450
13.00	1.0766E-07	1.0659E-07	-0.996	1.1390E-07	5.798
14.00	2.2949E-08	2.3252E-08	1.321	2.4976E-08	8.833
15.00	4.7318E-09	4.9405E-09	4.411	5.3292E-09	12.626

APPENDIX

Program Listing for C at $\beta = \infty$

```
C       THIS PROGRAM PRODUCES TABLE 1.  THE PRIMARY OUTPUT
C       IS C FOR BETA = INFINITY.
C
        IMPLICIT REAL*8(A-H,O-Z)
        DATA BOTTOM,TOP,TOP1,PI,DELG,EPS,NG/0.D0,13.5D0,
     1  4.D0,3.1415926535897 93D0,2.D0,1.D-8,76/
        EXTERNAL CINT,DCINT
        PRINT 400
400     FORMAT(1H1,//42X,'TABLE 1',/,22X,'GRAIN BOUNDARY ',
     1  'CONCENTRATION AND RELATED QUANTITIES',/,38X,'VS.',
     2  ' G FOR     =',/,1H0,2X,'G',9X,'C',13X,'A',11X,
     3  'LOG(G)',36X,'LOG(  )')
        RTPI=DSQRT(PI)
        C=1
        DC=1
        DO 30 I=1,NG
        G=(I-1)*DELG/10
        EPS1=DABS(C)*EPS
        EPS2=DABS(DC)*EPS
        IF(I.EQ.1)GO TO 5
        C=2*ANC6(BOTTOM,TOP,EPS1,NIT,1,CINT,G,RTPI)/RTPI
5       P473=3.D0/2.**(8.D0/3)
        ASYMP=C*G**(2.D0/3)*DEXP(P473*G**(4.D0/3))
        DC=ANC6(0.D0,TOP1,EPS2,NIT1 ,1,DCINT,G,RTPI)
        IF(G.NE.0)DLGG=DLOG(G)
        PHI=-DLOG(C)
        DC=-2.**(3.D0/2)*DC/PI
        DPHI=-DC/C
        IF(DPHI.NE.0)DLGDPH=DLOG(DPHI)
C
C       SKIP TO NEW PG. AFTER G=7 (ASSUMES .2 STEPS).
C
        IF(I.EQ.37)PRINT 406
406     FORMAT(1H1)
C
C       DIFFERENT FORMAT FOR G = 0
C
        IF(G.EQ.0)PRINT408,G,C,ASYMP,PHI,DPHI,DLGDPH
408     FORMAT(1H F4.1,1P2E14.4,14X,3E14.4)
        IF(G.NE.0)PRINT 410,G,C,ASYMP,DLGG,PHI,DPHI,DLGDPH
410     FORMAT(1H F4.1,1P6E14.4)
30      CONTINUE
        PRINT 415
415     FORMAT(1H1)
        STOP
        END
```

```
C
C       CINT IS INTEGRAND USED IN CALCULATION OF C.
C
        FUNCTION CINT(G,RTPI,X)
        IMPLICIT REAL*8(A-H,O-Z)
        COMMON/SCALE/SCA,SCA1
        CINT=0
C
C       INTEGRAND IS ZERO IN LIMIT AT X=0
C
        IF(X.EQ.0)RETURN
        V=G**2/(8*X**2)
        CINT=DEXP(-X**2)*DERFC(V)
        RETURN
        END

C
C       DCINT IS INTEGRAND USED IN CALCULATION OF
C       DERIVATIVE OF C WITH RESPECT TO G
C
        FUNCTION DCINT(G,RTPI,X)
        IMPLICIT REAL*8(A-H,O-Z)
        COMMON/BET/BETA
        DCINT=0
        IF(X.EQ.0.)RETURN
        V=G**2/(8*X**2)
        DCINT=DEXP(-V-X**4)
        RETURN
        END


C     ADAPTIVE QUADRATURE ROUTINE BASED ON NEWTON-COTES
C     7 POINT RULE
C
C     CALLING SEQUENCE IS    EXTERNAL F,REAL*8 A,B,EPS,F,
C     ANC6,Y,   Y=ANC6(A,B,EPS,M,N,F) WHERE A IS
C     THE LOWER LIMIT OF INTEGRATION AND B IS THE UPPER,
C     EPS IS AN UPPER BOUND ON THE ABSOLUTE ERROR,M
C     WILL RETURN THE NUMBER OF INTEGRAND EVALUATIONS,N
C     CONTROLS CONVERGENCE WITH N=1,2,3 AS ABSOLUTE,L1
C     AND LINFINITY, RESP. MOST USE N=1. F IS THE INTEGRAND
C     FUNCTION SUBPROGRAM. METHOD USES A SIXTH ORDER
C     NEWTON-COTES ADAPTIVE SCHEME.
C
C     PROGRAM AUTHOR K.HILLSTROM,ARGONNE NATIONAL LABORATORY,
C       APPLIED MATH. DIV.,9700 CASS AVE.,ARGONNE,IL 60439.
C
      FUNCTION ANC6(A1,B1,EP,M,N,FUN,G,V)
      DOUBLE PRECISION G,V
```

```
      DOUBLE PRECISION  ANC6,A1,B1,EP,FUN,A,B,EPS,SUM,ESUM,
     1F1,FS,F3,FM,F2,FT,F4,FB,FTP,FBP,FMAX,FTST,EST,AEST,
     2AEST2,ABSAR,DELTA,DIFF,DAFT,FA,SA,
     3TSUM,DA,XB,SX,EST1,EST2,AEST1
      DOUBLE PRECISION FR,F5,FU,F6,XR,X5,XU,X6,FUP
      DIMENSION EST2(30),NRTR(30)
      DIMENSION F2(30),F4(30),FTP(30),FBP(30),FTST(7)
      DIMENSION AEST2(30),XB(30)
      DIMENSION FUP(30),F6(30)
C     THE PARAMETER SETUP FOR THE INITIAL CALL
      IF(N.LE.0)GO TO 210
      IF(N.GT.3)GO TO 211
      A=A1
      B=B1
      EPS=EP*255.0D0
      ESUM=0.0D0
      TSUM=0.0D0
      LVL=1
      DA=B-A
      FA=FUN(G,V,A)
      FR=FUN(G,V,(5.0D0*A+B)/6.0D0)
      FS=FUN(G,V,(2.0D0*A+B)/3.0D0)
      FM=FUN(G,V,(A+B)*0.5D0)
      FT=FUN(G,V,(A+2.0D0*B)/3.0D0)
      FU=FUN(G,V,(A+5.0D0*B)/6.0D0)
      FB=FUN(G,V,B)
      M=7
      FMAX=DABS(FA)
      FTST(1)=FMAX
      FTST(2)=DABS(FR)
      FTST(3)=DABS(FS)
      FTST(4)=DABS(FM)
      FTST(5)=DABS(FT)
      FTST(6)=DABS(FU)
      FTST(7)=DABS(FB)
      DO 100 I=2,7
      IF(FMAX.GE.FTST(I))GO TO 100
      FMAX=FTST(I)
  100 CONTINUE
      EST=(41.0D0*(FA+FB)+216.0D0*(FR+FU)+27.0D0*(FS+FT)+
     1272.0D0*FM)*DA/840.0D0
      ABSAR=(41.0D0*(FTST(1)+FTST(7))+216.0D0*(FTST(2)+
     1FTST(6))+27.0D0*(FTST(3)+FTST(5))+272.0D0*FTST(4))*
     2DA/840.0D0
      AEST=ABSAR
C     1=RECUR
    1 SX=(DA/(6.0D0*2.0D0**LVL))/140.0D0
```

```
  1 SX=(DA/(6.0D0*2.0D0**LVL))/140.0D0
    F1=FUN(G,V,(11.0D0*A+B)/12.0D0)
    F3=FUN(G,V,(9.0D0*A+3.0D0*B)/12.0D0)
    F5=FUN(G,V,(7.0D0*A+5.0D0*B)/12.0D0)
    F2(LVL)=FUN(G,V,(5.0D0*A+7.0D0*B)/12.0D0)
    F4(LVL)=FUN(G,V,(3.0D0*A+9.0D0*B)/12.0D0)
    F6(LVL)=FUN(G,V,(A+11.0D0*B)/12.0D0)
    EST1=SX*(41.0D0*(FA+FM)+216.0D0*(F1+F5)+27.0D0*
   1(FR+FS)+272.0D0*F3)
    FBP(LVL)=FB
    XB(LVL)=B
    FTP(LVL)=FT
    FUP(LVL)=FU
    EST2(LVL)=SX*(41.0D0*(FM+FB)+216.0D0*(F2(LVL)+
   1F6(LVL))+27.0D0*(FT+FU)+272.0D0*F4(LVL))
    SUM=EST1+EST2(LVL)
    FTST(1)=DABS(F1)
    FTST(2)=DABS(F3)
    FTST(3)=DABS(F5)
    FTST(4)=DABS(F2(LVL))
    FTST(5)=DABS(F4(LVL))
    FTST(6)=DABS(F6(LVL))
    FTST(7)=DABS(FM)
    AEST1=SX*(41.0D0*(DABS(FA)+FTST(7))+216.0D0*
   1(FTST(1)+FTST(3))+27.0D0*(DABS(FR)+DABS(FS))+
   2 272.0D0*FTST(2))
    AEST2(LVL)=SX*(41.0D0*(FTST(7)+DABS(FB))+
   1216.0D0*(FTST(4)+FTST(6))
   2+27.0D0*(DABS(FT)+DABS(FU))+272.0D0*FTST(5))
    ABSAR=ABSAR-AEST+AEST1+AEST2(LVL)
    M=M+6
    GO TO (201,200,202),N
200 DELTA=ABSAR
    GO TO 205
210 PRINT 39
 39 FORMAT(' ERROR RETURN-N.LE.0')
    RETURN
211 PRINT 40
 40 FORMAT(' ERROR RETURN-N.GT.3')
    RETURN
201 DELTA=1.0D0
    GO TO 205
202 DO 203 I=1,6
    IF(FMAX.GE.FTST(I))GO TO 203
    FMAX=FTST(I)
203 CONTINUE
    DELTA=FMAX
205 DAFT=EST-SUM
    DIFF=DABS(DAFT)
    DAFT=DAFT/255.0D0
    IF(DIFF-EPS*DELTA)6,6,3
  3 IF(LVL-30)4,2,2
```

```
    6 IF(LVL-1)2,4,2
C     2=UP
    2 A=B
      ESUM=ESUM+DAFT
      TSUM=TSUM+SUM
    9 LVL=LVL-1
      L=NRTR(LVL)
      GO TO (11,12),L
C     11=R1,12=R2
    4 NRTR(LVL)=1
      EST=EST1
      AEST=AEST1
      FB=FM
      FU=F5
      FT=FS
      FM=F3
      FS=FR
      FR=F1
      B=(A+B)/2.0D0
      EPS=EPS/2.0D0
    7 LVL=LVL+1
      GO TO 1
   11 NRTR(LVL)=2
      FA=FB
      FR=F2(LVL)
      FS=FTP(LVL)
      FM=F4(LVL)
      FT=FUP(LVL)
      FU=F6(LVL)
      FB=FBP(LVL)
      B=XB(LVL)
      EST=EST2(LVL)
      AEST=AEST2(LVL)
      GO TO 7
   12 EPS=EPS*2.0D0
      IF(LVL-1)5,5,9
    5 ANC6=TSUM-ESUM
      RETURN
      END
```

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