TABLE V. Calculated variables.

Pressure P (kbar)	Isothermal compressibility β_T (bar^{-1})	Thermal-expansion coefficient α ($°C^{-1}$)	Density ρ (g/cm^3)	Volume V ($V=1.0$ at 0°C)	Adiabatic compressibility β_{ad} (bar^{-1})
			$T=21.9°C$		
1	3.881×10^{-6}	1.766×10^{-4}	13.5948	1.00000	3.395×10^{-6}
2	3.751	1.724	13.6468	0.99621	3.289
3	3.632	1.685	13.6973	0.99254	3.192
4	3.522	1.648	13.7463	0.98900	3.102
5	3.419	1.614	13.7941	0.98557	3.018
6	3.324	1.581	13.8407	0.98225	2.941
7	3.235	1.551	13.8862	0.97904	2.868
8	3.15	1.52	13.931	0.9759	2.799
9	3.07	1.50	13.974	0.9729	2.735
10	3.00	1.47	14.017	0.9699	2.674
11	2.93	1.45	14.058	0.9671	2.616
12	2.87	1.42	14.099	0.9643	2.562
13	2.80	1.40	14.139	0.9615	2.510
			$T=40.5°C$		
1	3.963×10^{-6}	1.762×10^{-4}	13.5503	1.00330	3.444×10^{-6}
2	3.827	1.719	13.6032	0.99941	3.334
3	3.702	1.680	13.6545	0.99565	3.234
4	3.587	1.643	13.7043	0.99203	3.141
5	3.481	1.608	13.7528	0.98853	3.055
6	3.383	1.576	13.8001	0.98514	2.975
7	3.290	1.545	13.8462	0.98186	2.900
8	3.20	1.52	13.891	0.9787	2.829
9	3.12	1.49	13.935	0.9756	2.763
10	3.05	1.46	13.978	0.9726	2.701
11	2.98	1.44	14.020	0.9697	2.641
12	2.91	1.41	14.062	0.9668	2.585
13	2.84	1.39	14.102	0.9640	2.532
			$T=52.9°C$		
1	4.018×10^{-6}	1.760×10^{-4}	13.5207	1.00550	3.477×10^{-6}
2	3.878	1.717	13.5742	1.00154	3.365
3	3.749	1.677	13.6261	0.99773	3.262
4	3.632	1.640	13.6764	0.99405	3.167
5	3.523	1.605	13.7254	0.99050	3.080
6	3.422	1.572	13.7732	0.98707	2.998
7	3.327	1.542	13.8197	0.98375	2.921
8	3.24	1.51	13.865	0.9805	2.850
9	3.16	1.48	13.910	0.9774	2.782
10	3.08	1.46	13.953	0.9743	2.719
11	3.01	1.43	13.995	0.9714	2.659
12	2.94	1.41	14.037	0.9685	2.602
13	2.87	1.39	14.078	0.9657	2.548

pressure, for three temperatures, has been established while the change of velocity with temperature at 1 atm is given by Hubbard and Loomis.[27] The values for C_P at 1 atm and various temperatures are given by Douglas *et al.*[34] to an accuracy of 0.3%. Values for α at atmospheric pressure and T have been taken from the work of Beattie *et al.*,[35] which establishes α within about 1 part in 10^5. The density ρ is given by Bigg,[36] who used the most recent determination of the density of Hg at 20°C, in conjunction with Beattie's expansion formula, to determine ρ as a function of temperature to within about 4 ppm. Using the data for ρ and the sonic-velocity data of Hubbard and Loomis, the adiabatic compressibility of liquid Hg may be calculated according to Eq. (3). Using β_{ad}, and α and C_P from the above sources, β_T may be calculated according to Eq. (4). All the data are thus established for the initiation of the calculation at $P_1=1$ atm. The numerical values of the input data are shown in Table IV.

The results of the calculation for α, β_T, β_{ad}, ρ, and V as a function of P at 21.9°, 40.5°, and 52.9°C are shown in Table V. Figures 5–7 show the variation of α, β_T, and V with pressure. No variation of C_P with P

[34] T. B. Douglas, A. F. Ball, and D. C. Ginnings, J. Res. Natl. Bur. Std. **46**, 334 (1951).

[35] J. A. Beattie, B. E. Blaisdell, J. Kaye, H. T. Gerry, and C. A. Johnson, Proc. Am. Acad. Arts Sci. **74**, 371 (1941).

[36] P. H. Bigg, Brit. J. Appl. Phys. **15**, 1111 (1964).