

TABLE 2. Experimental Values of the Specific Volume and Compressibility of Helium

$t, ^\circ\text{C}$	$p, \text{kg/cm}^2$	$v, \times 10^3 \text{ m}^3/\text{kg}$	z	$z [14]$	$\delta, \%$
100,01 99,98	206,651 413,297	41,1085 21,9312	1,07477 1,14682	1,07333 1,14420	+0,13 +0,20
200,03 200,00	206,653 413,296	51,2919 26,9818	1,05750 1,11267	1,05596 1,11060	+0,15 +0,19
300,03 300,03 300,03 300,01	100,006 199,994 300,002 399,970	124,156 63,4055 43,1387 33,0170	1,02268 1,04446 1,06595 1,08773	1,02174 1,04330 1,06468 1,08581	+0,09 +0,11 +0,12 +0,18
400,00 400,00 400,00 400,00	100,007 199,998 299,999 400,000	145,261 73,9411 50,1128 38,2032	1,01884 1,03713 1,05437 1,07173	1,01793 1,03572 1,05344 1,07102	+0,09 +0,14 +0,09 +0,07
500,03 500,03 500,02 500,00	99,9953 200,007 299,998 400,012	166,317 84,4564 57,0928 43,4338	1,01548 1,03141 1,04583 1,06089	1,01513 1,03017 1,04516 1,06003	+0,03 +0,12 +0,06 +0,08

For the investigation we used helium of high purity containing 99.9972% helium and the following impurities: H_2 — 0.0001%, N_2 — 0.0011%, O_2 — 0.0003%, hydrocarbons — 0.0001%, Ne — 0.0012%, slight traces of water (dew point -60°C).

Table 1 compares our experimental data with the results of [3, 5]. We see from the table that the deviation in δ is no greater than 0.15%, except for a single point.

The experimental values of the specific volume and compressibility of the helium obtained in the present investigation are shown in Table 2. In the same table we compare the experimental values of the helium compressibility with the values calculated from the equation taken from [14] and recommended up to pressures of $p = 200 \text{ kg/cm}^2$. We see from the comparison that even at pressures of up to 400 kg/cm^2 the difference never exceeds the value of 0.2% given in [14].

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