

Table 3. Comparison of compressibility factor for nitrogen.

P atm	0°			25°			50°			75°		100°		
	Present work	Miche- ls et al	Bartlett	Present work	Miche- ls et al	Bartlett	Present work	Miche- ls et al	Bartlett	Present work	Miche- ls et al	Present work	Miche- ls et al	Bartlett
100	0.9850	0.9858	0.9846	1.0958	1.1011		1.2025	1.2046	1.2046	1.3052	1.3095	1.4102	1.4119	1.4114
200	1.0369	1.0363	1.0365	1.1533	1.1546		1.2670	1.2689	1.2742	1.3779	1.3800	1.4878	1.4885	1.4958
300	1.1336	1.1340	1.1335	1.2503	1.2514		1.3636	1.3655	1.3711	1.4780	1.4787	1.5855	1.5886	1.5971
400	1.2566	1.2568	1.2557	1.3740	1.3699		1.4800	1.4814	1.4870	1.5955	1.5942	1.7015	1.7025	1.7112
500	1.3885	1.3887		1.5002	1.4983		1.6105	1.6090		1.7212	1.7190	1.8260	1.8282	
600	1.5255	1.5251	1.5214	1.6345	1.6327		1.7438	1.7374	1.7473	1.8533	1.8490	1.9582	1.9555	1.9650
700	1.6620	1.6610		1.7715	1.7675		1.8764	1.8735		1.9858	1.9810	2.0937	2.0878	
800	1.7985	1.7983	1.7959	1.9070	1.9030		2.0118	2.0041	2.0155	2.1176	2.1139	2.2259	2.2200	2.2273
900	1.9345	1.9322		2.0403	2.0390		2.1467	2.1428		2.2515	2.2480	2.3566	2.3528	
1000	2.0675	2.0680	2.0641	2.1714	2.1710		2.2768	2.2711	2.2825	2.3810	2.3810	2.4886	2.4870	2.4942

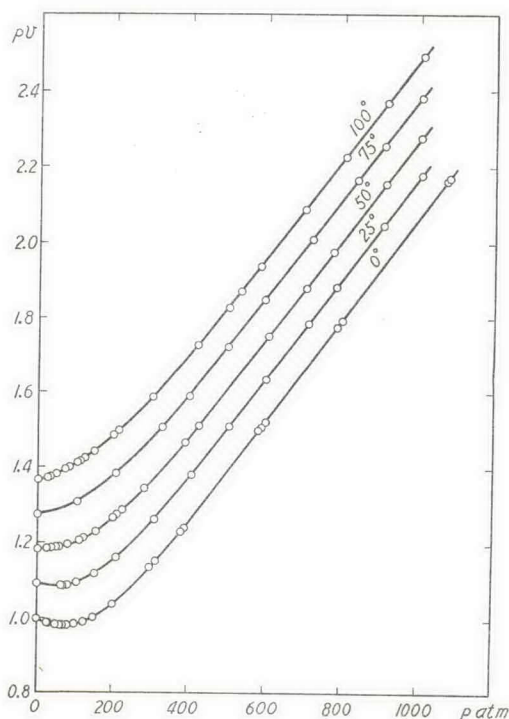


Fig. 5. Compressibility isotherms of nitrogen.

Table 4.

Temp. °C	$PV = A + B\rho + C\rho^2 + D\rho^3 + E\rho^4$ for nitrogen up to 1000 atm					Range of ρ
	A	B · 10 ³	C · 10 ⁶	D · 10 ⁹	E · 10 ¹²	
0	1.0005	-0.3985	2.362	0.854	11.167	up to 500 Am.
25	1.0921	-0.2596	3.010	0.949	10.411	up to 460 Am.
50	1.1837	-0.0419	3.077	1.424	10.720	up to 440 Am.
75	1.2753	0.1483	3.360	2.153	9.387	up to 420 Am.
100	1.3669	0.3593	3.388	2.281	10.840	up to 400 Am.

$PV = 1.0000$ at 0°C, 1 atm. $\rho =$ Amagat density.

Table 5. Observed values of pressure P , density ρ and PV for methane.

0°			25°			50°			75°			100°	
atm	ρ Am	PV	P atm	ρ Am	PV	P atm	ρ Am	PV	P atm	ρ Am	PV	P atm	ρ Am
110	30.035	0.9359	66.245	67.922	0.9753	27.742	24.262	1.1434	65.453	54.093	1.2100	27.927	20.78
118	38.188	0.9196	82.231	86.486	0.9508	46.513	41.510	1.1205	81.020	67.590	1.1987	34.910	26.07
1302	56.870	0.8845	106.27	114.98	0.9242	61.721	56.104	1.1001	101.15	85.344	1.1852	38.077	28.49
1510	78.380	0.8485	124.64	137.21	0.9084	65.543	59.774	1.0965	124.68	106.30	1.1730	50.687	38.19
1513	86.770	0.8357	145.94	163.19	0.8943	72.505	66.622	1.0883	151.81	129.88	1.1689	65.430	49.68
1995	106.088	0.8106	163.44	183.23	0.8920	81.470	75.588	1.0778	159.90	136.87	1.1683	80.465	61.51
2079	115.47	0.7974	187.80	209.11	0.8968	90.712	84.936	1.0680	197.99	168.53	1.1748	94.129	72.25
263	136.95	0.7786	201.29	223.06	0.9024	101.78	95.964	1.0606	231.37	194.27	1.1910	120.72	93.29
2635	162.54	0.7589	244.23	260.84	0.9363	110.50	105.07	1.0517	280.44	227.94	1.2303	131.46	101.64
2656	200.06	0.7426	244.87	261.19	0.9375	127.45	122.24	1.0426	280.78	228.02	1.2314	150.64	116.49
2682	224.42	0.7433	295.93	296.49	0.9981	148.37	143.44	1.0344	298.58	239.15	1.2485	167.55	129.36
2665	247.98	0.7527	403.70	349.52	1.1550	166.81	161.46	1.0331	414.23	297.43	1.3927	184.18	141.74
2680	264.15	0.7640	490.06	380.72	1.2872	186.29	179.59	1.0373	528.62	339.46	1.5572	201.27	154.17
2657	315.63	0.8351	577.99	404.36	1.4294	203.57	194.80	1.0450	633.94	369.11	1.7175	255.76	191.25
2665	347.42	0.9201	683.50	427.86	1.5975	246.64	230.07	1.0720	747.02	394.27	1.8947	302.96	219.70
2646	379.31	1.0373	922.67	467.20	1.9749	404.04	319.80	1.2634	860.12	415.86	2.0683	337.08	238.25
2663	412.48	1.2089	1039.7	483.09	2.1521	503.13	355.77	1.4142	1047.5	444.76	2.3552	403.34	269.94
2616	413.17	1.2106				587.06	379.90	1.5453				504.51	308.90
2603	462.13	1.5884				859.21	435.90	1.9711				621.76	344.20
2669	478.30	1.7493				1018.6	459.32	2.2177				795.97	384.30
262	510.41	2.1340										1012.2	422.00