It was tried to develop the experimental compressibility factor Z of gaseous ammonia in this work in the power series of density $1/V$ and pressure P respectively at each temperature. The results were obtained as shown in Table 4, from the calculation by the least squares method.

The Z values calculated by the use of the coefficients given in Table 4 agreed with the experimental Z values with the average deviation not exceeding 0.2% approximately up to the saturated vapor

Table 1   Compressibility factor of gaseous ammonia

P (atm)	$Z = Pv/nRT$				
	25°C	50°C	75°C	100°C	125°C
0	1.0000	1.0000	1.0000	1.0000	1.0000
2	0.9780	0.9856			
4	0.9546	0.9704			
5			0.9724	0.9787	0.9834
6	0.9308	0.9544			
7	0.9171				
8	0.9027	0.9372			
9	0.8862				
9.3	0.8800				
9.5	0.8743				
9.7	0.8656				
10		0.9188	0.9420	0.9560	0.9660
12		0.8993			
14		0.8793			
15			0.9089	0.9318	0.9477
16		0.8592			
18		0.8385			
19		0.8255			
19.5		0.8150			
19.8		0.8027			
20			0.8729	0.9061	0.9286
25			0.8340	0.8788	0.9086
30			0.7925	0.8502	0.8878
35			0.7435	0.8199	0.8662
40				0.7882	0.8437
45				0.7540	0.8204
50				0.7174	0.7962
55				0.6764	0.7712
60				0.6290	0.7446
65					0.7170
70					0.6873
75					0.6556
80					0.6205
85					0.5813
90					0.5350
95					0.4720

Table 2 Compressibility factor of gaseous ammonia

$1/V$ (mol/l)	$Z=Pv/nRT$				
	25°C	50°C	75°C	100°C	125°C
0	1.0000	1.0000	1.0000	1.0000	1.0000
0.2	0.9477	0.9595			
0.25			0.9599	0.9668	0.9725
0.4	0.8926	0.9195			
0.45	0.8715				
0.5	0.8130	0.8992	0.9203	0.9341	0.9453
0.6		0.8798			
0.7		0.8603			
0.75			0.8811	0.9017	0.9183
0.8		0.8393			
0.85		0.8275			
0.9		0.8140			
0.95		0.7946			
1		0.7545	0.8424	0.8698	0.8916
1.25			0.8042	0.8384	0.8651
1.5			0.7664	0.8073	0.8388
1.75			0.7202	0.7767	0.8128
2				0.7476	0.7880
2.25				0.7192	0.7643
2.5				0.6917	0.7412
2.75				0.6655	0.7191
3				0.6405	0.6975
3.5					0.6560
4					0.6158
4.5					0.5791
5					0.5446
5.5					0.5123
6					0.4812

pressures.

The coefficients B in Table 4 can be regarded as the experimental second virial coefficients. They were compared with the second virial coefficients given by Keyes[10] and the theoretically calculated ones with the assumption of some adequate potential function on the intermolecular force of ammonia.

B (cc/g) $= 2.4 - (2316/T)$ exp $(7.744 \times 10^4/T^2)$ for the second virial coefficient B of ammonia had been presented by Keyes. This is the experimental equation obtained by correlating the experimental P-V-T data of Meyers and Jessup with those of Beattie and Laurence. For the theoretical calculation of the second virial coefficient, it was assumed that the intermolecular force of ammonia might be represented by the Stockmayer potential function. The parameters in the function were taken as follows: $r_0=2.60$Å, $b_0=(2Nr_0^3/3)=22.12$ cc/mol, $\varepsilon/k=320$ K and $\mu=1.47$ debyes. Then, using the

10) F. G. Keyes, *J. Am. Chem. Soc.*, **60**, 1761 (1938)