Table 3 Comparison of compressibility factor for gaseous ammonia

P (atm)	Present work	Previous work[5]	Deviation (%)	Meyers *et al.*[8]	Deviation (%)	Beattie *et al.*[9]	Deviation (%)
			25°C				
2	0.9780	0.9780	0.00	0.9784	0.04		
4	0.9546	0.9546	0.00	0.9564	0.09		
6	0.9308	0.9308	0.00	0.9332	0.26		
7	0.9171	0.9171	0.00	0.9209	0.41		
8	0.9027	0.9027	0.00	0.9081	0.58		
9	0.8862	0.8862	0.00				
			50°C				
2	0.9856	0.9856	0.00	0.9848	−0.08		
4	0.9704	0.9704	0.00	0.9690	−0.14		
6	0.9544	0.9544	0.00	0.9528	−0.17		
8	0.9372	0.9372	0.00	0.9356	−0.17		
10	0.9188	0.9188	0.00	0.9179	−0.10		
12	0.8993	0.8993	0.00	0.8998	0.06		
14	0.8793	0.8787	−0.07	0.8805	0.13	0.8805	0.13
16	0.8592	0.8557	−0.41			0.8606	0.16
18	0.8385	0.8271	−1.35			0.8395	0.12
20	0.8255	0.8040	−2.60				
			75°C				
5	0.9724	0.9724	0.00			0.9706	−0.18
10	0.9420	0.9420	0.00			0.9399	−0.22
15	0.9089	0.9089	0.00			0.9068	−0.23
20	0.8729	0.8729	0.00			0.8718	−0.13
25	0.8340	0.8340	0.00			0.8339	−0.01
30	0.7925	0.7925	0.00			0.7921	−0.05
35	0.7435	0.7385	−0.67			0.7463	0.38

relations of $B=b_0B^*(T^*, t^*)$, $T^*=kT/\varepsilon$, $t^*=(8)^{-1/2}\ \mu^{*2}$ and $\mu^*=\mu/(\varepsilon r_0^3)^{1/2}$, the second virial coefficients B at each temperature T were obtained by the use of the table of the reduced second virial coefficient B^* given by Hirschfelder *et al.*[11]. The results have been represented graphically in Fig. 5. It shows that the values by Keyes and the theoretically calculated values have the deviations of about 5 and 10% respectively from the values of this work at each temperature.

Liquid ammonia

The *P-V-T* relations of liquid ammonia were measured at 25, 50, 75, 100 and 125°C from each saturated vapor pressure to 500 atm. The smoothed values of the compressibility factor and of the

11) J. O. Hirschfelder, C. F. Curtiss and R. B. Bird, "Molecular Theory of Gases and Liquids," John Wiley and Sons, New York (1954)

Table 3 (continued)

P (atm)	Present work	Previous work[5]	Deviation (%)	Meyers *et al.*[8]	Deviation (%)	Beattie *et al.*[9]	Deviation (%)
				100°C			
5	0.9787	0.9787	0.00	0.9769	−0.18	0.9768	−0.19
10	0.9560	0.9560	0.00	0.9538	−0.23	0.9534	−0.27
15	0.9318	0.9318	0.00	0.9296	−0.23	0.9294	−0.26
20	0.9061	0.9061	0.00	0.9045	−0.18	0.9041	−0.22
25	0.8788	0.8788	0.00			0.8777	−0.12
30	0.8502	0.8502	0.00			0.8502	0.00
35	0.8199	0.8199	0.00			0.8208	0.11
40	0.7882	0.7882	0.00			0.7895	0.16
45	0.7540					0.7557	0.23
50	0.7174					0.7190	0.23
55	0.6764					0.6776	0.18
60	0.6290						
				125°C			
5	0.9834	0.9834	0.00			0.9816	−0.18
10	0.9660	0.9660	0.00			0.9633	−0.28
15	0.9477	0.9477	0.00			0.9444	−0.35
20	0.9286	0.9286	0.00			0.9255	−0.33
25	0.9086	0.9086	0.00			0.9063	−0.25
30	0.8878	0.8878	0.00			0.8861	−0.19
35	0.8662	0.8662	0.00			0.8652	−0.11
40	0.8437	0.8437	0.00			0.8436	−0.01
45	0.8204	0.8204	0.00			0.8208	0.05
50	0.7962					0.7968	0.07
55	0.7712					0.7720	0.10
60	0.7446					0.7460	0.19
65	0.7170					0.7188	0.25
70	0.6873						
75	0.6556						
80	0.6205						
85	0.5813						
90	0.5350						
95	0.4720						

Deviation $=(Z_{\text{other worker}}-Z_{\text{present work}})/Z_{\text{present work}}$

specific volume were obtained graphically plotting a lot of the experimental data. They are shown in Tables 5 and 7, respectively.

All of the deviations between the experimental and the smoothed values are less than 0.1%. The saturated vapor pressures shown in these tables were measured to be constant within the maximum fluctuation of 0.05 atm at each temperature. Table 6 shows the comparison of the saturated vapor pressures given by this work, by Beattie and Laurence[9] and by International Critical Tables[12]. It