Table 3 Most probable values and supplemetary values for the compressibility factor of propene

Pressure 10^5 Pa (= bar)	Temperature K (℃)										
	248.15 (- 25)	273.15 (0)	298.15 (25)	323.15 (50)	348.15 (75)	373.15 (100)	398.15 (125)	423.15 (150)	448.15 (175)	473.15 (200)	498.15 (225)
1	0.97481 (0.00020)	0.98151 (0.00020)	0.98602 (0.00020)	0.98919 (0.00020)	0.99148 (0.00020)	0.99317 (0.00020)	0.99444 (0.00020)	0.99543 (0.00020)	0.99623 (0.00020)	0.99689 (0.00020)	0.99746 (0.00020)
5			0.9246 *	0.9450 *	0.9591 *	0.9640 *	0.9714 *	0.9767 *	0.9812 *	0.9847 *	0.9870 *
10			0.8354 (0.0006)	0.8792 (0.0006)	0.9073 (0.0010)	0.9274 (0.0003)	0.9418 (0.0003)	0.9530 (0.0004)	0.9618 (0.0008)	0.9692 (0.0005̄)	0.9740 (0.0006)
20				0.7154 *	0.7972 (0.0001)	0.8455̄ (0.0008)	0.8792 (0.0004)	0.9035 (0.0003)	0.9221 (0.0005̄)	0.9370 (0.0003)	0.9477 (0.0006)
30					0.6450 (0.0006)	0.7508 (0.0004)	0.8108 (0.0003)	0.8517 (0.0002)	0.8811 (0.0001)	0.9039 (0.0003)	0.9212 (0.0002)
40						0.6308 (0.0011)	0.7355̄ (0.0006)	0.7966 (0.0007)	0.8385 (0.0015)	0.8718 (0.0005)	0.8962 (0.0011)
50						0.4359 (0.0012)	0.6492 (0.0003)	0.7390 (0.0006)	0.7966 (0.0013)	0.8385̄ (0.0004)	0.8697 (0.0002)
60						0.2569 (0.0005̄)	0.5506 (0.0004)	0.6786 (0.0016)	0.7541 (0.0016)	0.8073 (0.0004)	0.8453 (0.0000)
70						0.2692 (0.0000)	0.4488 (0.0001)	0.6184 (0.0020)	0.7123 (0.0023)	0.7767 (0.0005̄)	0.8219 (0.0002)
80						0.2920 (0.0000)	0.3931 (0.0003)	0.5635 (0.0010)	0.6737 (0.0019)	0.7480 (0.0006)	0.7998 (0.0003)
90						0.3171 (0.0002)	0.3841 (0.0004)	0.5223 (0.0004)	0.6402 (0.0003)	0.7212 (0.0000)	0.7790 (0.0003)
100						0.3419 (0.0002)	0.3932 (0.0003)	0.4990 (0.0004)	0.6132 (0.0002)	0.6980 (0.0001)	0.7609 (0.0007)
110						0.3684 (0.0002)	0.4091 (0.0001)	0.4908 (0.0002)	0.5943 (0.0002)	0.6791 (0.0003)	0.7457 (0.0012)
120						0.3944 (0.0004)	0.4284 (0.0002)	0.4938 (0.0002)	0.5833 (0.0001)	0.6662 (0.0003)	0.7344 (0.0016)
130						0.4202 (0.0007)	0.4496 (0.0005̄)	0.5042 (0.0003)	0.5798 (0.0006)	0.6584 (0.0003)	0.7262 (0.0013)
140						0.4460 (0.0008)	0.4718 (0.0007)	0.5182 (0.0006)	0.5830 (0.0008)	0.6552 (0.0003)	0.7204 (0.0008)
150						0.4715̄ (0.0006)	0.4949 (0.0011)	0.5341 (0.0002)	0.5912 (0.0005)	0.6560 (0.0001)	0.7175̄ (0.0004)
160						0.4971 (0.0006)	0.5177 (0.0009)	0.5523 (0.0005̄)	0.6024 (0.0007)	0.6604 (0.0002)	0.7176 (0.0002)
170						0.5226 (0.0005)	0.5404 (0.0008)	0.5717 (0.0011)	0.6158 (0.0016)	0.6670 (0.0001)	0.7205 (0.0006)
180						0.5480 (0.0005̄)	0.5633 (0.0008)	0.5911 (0.0011)	0.6304 (0.0017)	0.6767 (0.0004)	0.7266 (0.0006)
190						0.5734 (0.0006)	0.5863 (0.0010)	0.6110 (0.0010)	0.6455̄ (0.0010)	0.6872 (0.0003)	0.7344 (0.0012)
200						0.5986 (0.0005̄)	0.6094 (0.0010)	0.6312 (0.0010)	0.6620 (0.0015̄)	0.7000 (0.0002)	0.7438 (0.0013)
250						0.7222 (0.0007)	0.7251 (0.0009)	0.7359 (0.0009)			
300						0.8429 (0.0007)	0.8382 (0.0008)	0.8412 (0.0004)			
350						0.9602 (0.0013)	0.9494 (0.0010)	0.9453 (0.0007)			
400						1.0756 (0.0017)	1.0588 (0.0014)	1.0479 (0.0014)			
450						1.1894 (0.0020)	1.1665 (0.0018)	1.1501 (0.0017)			
500						1.3015 (0.0022)	1.2727 (0.0022)	1.2505̄ (0.0021)			
600						1.5214 (0.0024)	1.4806 (0.0024)	1.4474 (0.0022)			

: The most probable values

* : The supplementary values

( ) : Value of standard deviation

pressure (bar): 1, 5, 10, 20, 30,·····200 (interval of 10 bar)
200, 250, 300, ·····500 (interval of 50 bar)
500, 600, 700,·····1000 (interval of 100 bar).

The values of Z at the above grid-points, Z_i, were obtained from the original data reported in respective works. When the data reported are not what were gained at one of the common grid-point specified, the interpolation procedures were carried out along an isotherm or an isobar on a digital computer using the least squares method. The precaution was paid for this procedure in order to retain the experimental accuracy for each original work. Then the mean value at each grid-point was calculated with the weights determined in the critical evaluation as described in the preceding section. The standard deviations σ were also calculated by the following expression:

$$\sigma=\sqrt{\frac{\Sigma[w_i(Z_i-\bar{Z})^2]}{(n-1)\,\Sigma\, w_i}}$$

where, w_i=the weight given,
Z_i=the compressibility factor in the original work,
$\bar{Z}$=the tabulated compressibility factor value,
n=the number of data sources.

The weighted mean compressibility factor values obtained for propane and propene are shown in the regions enclosed with dashed-lines in Tables 2 and 3, respectively, together with their standard deviations in brackets. Although every weighted mean value was determined independently of the adjacent values, the consistency among them was found to be satisfactory. Thus the committee recommended these weighted mean values as the most probables.

For propane and propene, the reliable values of Z at 1 bar cannot be obtained by extrapolating the experimental values of Z at high pressures to 1 bar. The authors collected the reliable data of the experimental second and third virial coefficients, B_T (in bar^{-1}) and C_T (in bar^{-2}) at low pressure for propane[4,5,7,19~28] and propene[15,17,28~32]. Then using the expression: $Z=1+B_TP+C_TP^2$, each value of Z at 1 bar and at each experimental temperature was calculated. Their equally weighted mean values at the grid-points on 1 bar were calculated applying the least square method to develop the compressibility factor into the power seires of temperature. In Tables 2 and 3, they are given as the recom-

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