# JEDNADŽBE STANJA

## REDUCIRANE VELIČINE

$$p_r = \frac{p}{p_c}, \qquad T_r = \frac{T}{T_c}, \qquad v_r = \frac{v}{v_c} \tag{1}$$

## KOEFICIJENT KOMPRESIBILNOSTI

$$z = \frac{v}{v_{id}} = \frac{pv}{RT} \tag{2}$$

## PSEUDOKRITIČNA SVOJSTVA

***Pseudokritična temperatura***

$$T_{pc} = \sum_{i=1}^{nKo} y_i T_{c_i} \qquad \text{(KAYEVO PRAVILO)} \tag{3}$$

$$\left(0.5 < T_{c,i} / T_{c,j} < 2\right) \wedge \left(0.5 < p_{c,i} / p_{c,j} < 2\right)$$

$$T_{cm} = \left\{ \frac{\left[ \sum_{i=1}^{nKo} y_i \left( T_{ci}^{5/2} / p_{ci} \right)^{1/2} \right]^2}{\sum_{i=1}^{nKo} y_i \left( T_{ci} / p_{ci} \right)} \right\}^{2/3} \qquad \text{(REDLICH - KWONG)} \tag{4}$$

***Pseudokritični tlak***

$$p_{pc} = \frac{R\left( \sum_{i=1}^{nKo} y_i z_{c,i} \right) T_{pc}}{\sum_{i=1}^{nKo} y_i v_{c,i}} \qquad \text{(PRAUSNITZ - GUNN)} \tag{5}$$

$$p_{cm} = \frac{T_{cm}}{\sum_{i=1}^{nKo} y_i \left( T_{c,i} / p_{c,i} \right)} \qquad \text{(REDLICH - KWONG)} \tag{6}$$

## FAKTOR ACENTRIČNOSTI ZA SMJESU

$$\omega_m = \sum_{i=1}^{nKo} y_i \omega_i \tag{7}$$

**VAN DER WAALSOVA JEDNADŽBA STANJA**

$$p = \frac{RT}{v-b} - \frac{a}{v^2} \tag{8a}$$

$$v^3 - v^2\left(b + \frac{RT}{p}\right) + v\left(\frac{a}{p}\right) - \frac{ab}{p} = 0 \tag{8b}$$

$$z^3 - z^2\left(\frac{bp}{RT} + 1\right) + z\frac{ap}{R^2T^2} - \frac{abp^2}{R^3T^3} = 0 \tag{8c}$$

$$T = \frac{v-b}{R}\left(p + \frac{a}{v^2}\right) \tag{8d}$$

***Parametri***

$$a = \frac{27R^2T_{\mathrm{K}}^2}{64p_{\mathrm{K}}} \tag{9}$$

$$b = \frac{RT_{\mathrm{K}}}{8p_{\mathrm{K}}} \tag{10}$$

***Fugacitivnost***

$$\ln f = \ln\frac{RT}{v-b} + \frac{b}{v-b} - \frac{2a}{RTv} \tag{11}$$

**REDLICH-KWONGOVA JEDNADŽBA STANJA**

$$p = \frac{RT}{v-b} - \frac{a}{T^{0.5}v(v+b)} \tag{12a}$$

$$v^3 - \frac{RT}{p}v^2 - \left(b^2 + \frac{RTb}{p} - \frac{a}{p\sqrt{T}}\right)v - \frac{ab}{p\sqrt{T}} = 0 \tag{12b}$$

$$z^3 - z^2 + \left(A - B^2 - B\right)z - AB = 0 \tag{12c}$$

$$v^{(i+1)} = \frac{RT}{p + \dfrac{a}{\sqrt{T}v^{(i)}(v^{(i)} + b)}} + b \tag{12d}$$

$$T^{(i+1)} = \frac{v-b}{R}\left[p + \frac{a}{\sqrt{T^{(i)}}v(v+b)}\right] \tag{12e}$$

***Parametri***

$$a = \frac{\Omega_a R^2 T_c^{5/2}}{P_c} \tag{13}$$

$$b = \frac{\Omega_b R T_c}{P_c} \tag{14}$$

$$\Omega_a = \frac{1}{9\left(2^{1/3} - 1\right)} = 0.427480 \tag{15}$$

$$\Omega_b = \frac{\left(2^{1/3} - 1\right)}{3} = 0.086640 \tag{16}$$

$$A = \frac{ap}{R^2 T^{5/2}} \tag{17}$$

$$B = \frac{bp}{RT} \tag{18}$$

***Unakrsni parametri***

$$a_{ij} = \sqrt{a_i a_j} \qquad \text{(REDLICH-KWONG)} \quad (19a)$$

$$\left(a\alpha\right)_{12} = \left(1 - k_{12}\right)\sqrt{\left(a\alpha\right)_1 \left(a\alpha\right)_2} \qquad \text{(SOAVE-REDLICH-KWONG)} \quad (19b)$$

$$a_{ij} = (1 - c_{ij})\sqrt{a_i a_j} \qquad \text{(ZUDKEVICH-JOFFE)} \quad (19c)$$

$$a_{ij} = \frac{\Omega_a R (V_{ci}^{1/3} + V_{cj}^{1/3})^3 \left[(1 - k_{ij})\sqrt{T_{ci} T_{cj}}\right]^{1.5}}{8\left[0.291 - 0.04(\omega_i + \omega_j)\right]} \qquad \text{(PRAUSNITZ-CHUEH)} \quad (19d)$$

***Pravila miješanja***

$$a = \sum\sum y_i y_j a_{ij} \tag{20}$$

$$b = \sum y_i b_i \tag{21}$$

$$A = \sum\sum y_i y_j A_{ij} \tag{22}$$

$$B = \sum y_i B_i \tag{23}$$

*Dvokomponentne smjese*

$$a_{\mathrm{M}} = y_1^2 a_1 + 2 y_1 y_2 a_{12} + y_2^2 a_2 \qquad \text{(vdW)} \quad (24)$$

$$\begin{aligned} a_{\mathrm{M}} &= a_{11} y_1^2 + a_{12} y_1 y_2 + a_{21} y_2 y_1 + a_{22} y_2^2 = \\ &= a_1 y_1^2 + 2 a_{12} y_1 y_2 + a_2 y_2^2 \end{aligned} \qquad \text{(RK)} \quad (25)$$

$$a_{11} = a_1 \qquad a_{22} = a_2 \qquad a_{12} = a_{21}$$

$$\begin{aligned} \left(a\alpha\right)_{\mathrm{M}} &= \left(a\alpha\right)_{11} y_1^2 + \left(a\alpha\right)_{12} y_1 y_2 + \left(a\alpha\right)_{21} y_2 y_1 + \left(a\alpha\right)_{22} y_2^2 = \\ &= \left(a\alpha\right)_1 y_1^2 + 2\left(a\alpha\right)_{12} y_1 y_2 + \left(a\alpha\right)_2 y_2^2 \end{aligned} \qquad \text{(SRK)} \quad (26)$$

$$\left(a\alpha\right)_{11} = \left(a\alpha\right)_1 \qquad \left(a\alpha\right)_{22} = \left(a\alpha\right)_2 \qquad \left(a\alpha\right)_{12} = \left(a\alpha\right)_{21}$$

$$b_{\mathrm{M}} = b_1 y_1 + b_2 y_2 \tag{27}$$

***Koeficijent fugacitivnosti čiste tvari***

$$\ln \phi = z - 1 - \ln(z - B) - \frac{A}{B} \ln(1 + \frac{B}{z}) \tag{28}$$

$$\ln \varphi = \ln \frac{v}{v-b} + \frac{a}{bRT^{3/2}} \ln \frac{v}{v+b} + (z-1) - \ln z \tag{29}$$

***Koeficijent fugacitivnosti komponente u smjesi***

$$\ln \hat{\varphi}_i = \frac{B_i}{B}(z-1) - \ln(z-B) + \frac{A}{B}\left[\frac{B_i}{B} - 2\sqrt{\frac{A_i}{A}}\right] \ln\left(1 + \frac{B}{z}\right) \tag{30}$$

**SOAVE-REDLICH-KWONGOVA JEDNADŽBA STANJA**

$$p = \frac{RT}{v-b} - \frac{a\alpha}{v(v+b)} \tag{31a}$$

$$v^3 - \frac{RT}{p} v^2 - \left(b^2 + \frac{RTb}{p} - \frac{a\alpha}{p}\right) v - \frac{a\alpha b}{p} = 0 \tag{31b}$$

$$z^3 - z^2 + (A - B^2 - B) z - AB = 0 \tag{31c}$$

$$v^{(i+1)} = \frac{RT}{p + \dfrac{a\alpha}{v^{(i)}(v^{(i)} + b)}} + b \tag{31d}$$

$$T^{(i+1)} = \frac{v-b}{R}\left[p + \frac{a\alpha}{v(v+b)}\right] \tag{31e}$$

***Parametri***

$$a = \frac{\Omega_a R^2 T_c{}^2}{P_c} \tag{32}$$

$$b = \frac{\Omega_b R T_c}{P_c} \tag{33}$$

$$\Omega_a = \frac{1}{9\left(2^{1/3} - 1\right)} = 0.427480 \tag{34}$$

$$\Omega_b = \frac{\left(2^{1/3} - 1\right)}{3} = 0.086640 \tag{35}$$

$$\alpha = \left(1 + \kappa\left(1 - \sqrt{T_{\mathrm{r}}}\right)\right)^2 \tag{36}$$

$$\kappa = 0.48508 + 1.55171\omega - 0.15613\omega^2 \tag{37}$$

za vodik: $\alpha = 1.202 \exp\left(-0.30288 T_{\mathrm{r}}\right)$ (GRABOSKI-DAUBERT) (38)

$$A = \frac{a\alpha p}{R^2 T^2} \tag{39}$$

$$B = \frac{bp}{RT} \tag{40}$$

***Koeficijent fugacitivnosti čiste tvari***

$$\ln\phi = z - 1 - \ln(z - B) - \frac{A}{B}\ln(1 + \frac{B}{z}) \tag{41}$$

$$\ln\varphi = \ln\frac{v}{v-b} + \frac{a\alpha(T)}{bRT}\ln\frac{v}{v+b} + (z-1) - \ln z \tag{42}$$

***Koeficijent fugacitivnosti komponente u smjesi***

$$\ln\hat{\varphi}_i = \frac{B_i}{B}(z-1) - \ln(z-B) + \frac{A}{B}\left[\frac{B_i}{B} - \frac{2}{a\alpha}\sum_{j=1}^{nKo} y_j (a\alpha)_{ij}\right]\ln\left(1 + \frac{B}{z}\right) \tag{43}$$

**PENG-ROBINSONOVA JEDNADŽBA STANJA**

$$p = \frac{RT}{v-b} - \frac{a\alpha}{v^2 + 2bv - b^2} \tag{44a}$$

$$v^3 - \left(\frac{RT}{p} - b\right)v^2 - \left(3b^2 + \frac{2RTb}{p} - \frac{a\alpha}{p}\right)v - \left(\frac{a\alpha b}{p} - \frac{RTb^2}{p} - b^3\right) = 0 \tag{44b}$$

$$z^3 - (1-B)z^2 + (A - 3B^2 - 2B)z - (AB - B^2 - B^3) = 0 \tag{44c}$$

$$T^{(i+1)} = \frac{v-b}{R}\left[p + \frac{a\alpha}{v^2 + 2bv - b^2}\right] \tag{44d}$$

***Parametri***

$$a = \frac{\Omega_a R^2 T_c^{\ 2}}{P_c} \tag{45}$$

$$b = \frac{\Omega_b R T_c}{P_c} \tag{46}$$

$$\Omega_a = 0.45724 \tag{47}$$

$$\Omega_b = 0.07780 \tag{48}$$

$$\alpha = \left(1 + \kappa\left(1 - \sqrt{T_r}\right)\right)^2 \tag{49}$$

$$\kappa = 0.37464 + 1.54226\omega - 0.26992\omega^2 \tag{50}$$

za vodik: $\alpha = 1.202\exp(-0.30288 T_r)$ (GRABOSKI-DAUBERT) (51)

$$A = \frac{a\alpha p}{R^2 T^2} \tag{52}$$

$$B = \frac{bp}{RT} \tag{53}$$

***Koeficijent fugacitivnosti čiste tvari***

$$\ln\phi = z - 1 - \ln(z - B) - \frac{A}{2\sqrt{2}B}\ln\left(\frac{z + (\sqrt{2}+1)B}{z - (\sqrt{2}-1)B}\right) \tag{54}$$

$$\ln\varphi = \ln\frac{v}{v-b} - \frac{a\alpha}{bRT\ 2\sqrt{2}}\ln\frac{v + b\left(1+\sqrt{2}\right)}{v + b\left(1-\sqrt{2}\right)} + \left(z-1\right) - \ln z \tag{55}$$

***Koeficijent fugacitivnosti komponente u smjesi***

$$\ln\hat{\varphi}_i = \frac{B_i}{B}\left(z-1\right) - \ln\left(z-B\right) + \frac{A}{2.828B}\left[\frac{B_i}{B} - \frac{2}{a\alpha}\sum_{j=1}^{nKo} y_j \left(a\alpha\right)_{ij}\right]\ln\left(\frac{z + (\sqrt{2}+1)B}{z - (\sqrt{2}-1)B}\right) \tag{56}$$

**SMJESE (SOAVE-REDLICH-KWONG I PENG ROBINSON)**

***Unakrsni parametri***

$$(a\alpha)_{ij} = (1 - k_{ij})\sqrt{(a\alpha)_i (a\alpha)_j} \tag{57}$$

$k_{ij} = 0$ (ZA PAROVE UGLJIKOVODIK - VODIK)

$k_{ii} = 0$

***Pravila miješanja***

$$(a\alpha)_M = \sum\sum y_i y_j (a\alpha)_{ij} \tag{58}$$

$$b_M = \sum y_i b_i \tag{59}$$

$$A_M = \sum\sum y_i y_j A_{ij} \tag{60}$$

$$B_M = \sum y_i B_i \tag{61}$$

***Lee-Keslerova korelacija***

$$z = z^{(0)}\left(T_r, p_r\right) + \omega z^{(1)}\left(T_r, p_r\right) \tag{62}$$

***Gibbs-Duhemova jednadžba***

$$\sum n_i d\overline{y}_i = 0 \tag{63}$$

$$\sum x_i d\overline{y}_i = 0$$

Tablica 1. Termodinamički podaci

| Rbr | Formula | Naziv_hrv | M | $T_{sl}$ | $T_{lv}$ | $T_c$ | $p_c$ | $v_c$ | $z_c$ | $\omega$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Ar | argon | 39,9 | 83,8 | 87,3 | 150,8 | 48,7 | 74,9 | 0,291 | 0,001 |
| 48 | He | helij-4 | 4,0 | | 4,3 | 5,2 | 2,3 | 57,4 | 0,302 | -0,365 |
| 54 | NO | dušik(II)-oksid | 30,0 | 109,5 | 121,4 | 180,0 | 64,8 | 57,7 | 0,250 | 0,588 |
| 55 | NO2 | dušik(IV)-oksid | 46,0 | 251,9 | 294,3 | 431,0 | 101,0 | 167,8 | 0,473 | 0,834 |
| 56 | N2 | dušik | 28,0 | 63,3 | 77,4 | 126,2 | 33,9 | 89,8 | 0,290 | 0,039 |
| 58 | Ne | neon | 20,2 | 24,5 | 27,1 | 44,4 | 27,6 | 41,6 | 0,311 | -0,029 |
| 59 | O2 | kisik | 32,0 | 54,4 | 90,2 | 154,6 | 50,4 | 73,4 | 0,288 | 0,025 |
| 60 | O2S | sumpor(IV)-oksid | 64,1 | 197,7 | 263,2 | 430,8 | 78,8 | 122,2 | 0,269 | 0,256 |
| 76 | H2 | vodik (normalni uvjeti) | 2,0 | 14,0 | 20,4 | 33,2 | 13,0 | 65,1 | 0,306 | -0,218 |
| 77 | H2O | voda | 18,0 | 273,2 | 373,2 | 647,3 | 221,2 | 57,1 | 0,235 | 0,344 |
| 78 | H2S | sumporovodik | 34,1 | 189,6 | 213,5 | 373,2 | 89,4 | 98,6 | 0,284 | 0,081 |
| 94 | CCl4 | ugljik(IV)-klorid | 153,8 | 250,0 | 349,9 | 556,4 | 45,6 | 275,9 | 0,272 | 0,193 |
| 97 | CO | ugljik(II)-oksid | 28,0 | 68,1 | 81,7 | 132,9 | 35,0 | 93,2 | 0,295 | 0,066 |
| 99 | CO2 | ugljik(IV)-oksid | 44,0 | 216,6 | | 304,1 | 73,8 | 93,9 | 0,274 | 0,239 |
| 103 | CHCl3 | kloroform | 119,4 | 209,6 | 334,3 | 536,4 | 53,7 | 238,9 | 0,293 | 0,218 |
| 112 | CH3Cl | metil-klorid | 50,5 | 115,4 | 249,1 | 416,3 | 67,0 | 138,9 | 0,269 | 0,153 |
| 116 | CH4 | metan | 16,0 | 90,7 | 111,6 | 190,4 | 46,0 | 99,2 | 0,288 | 0,011 |
| 117 | CH4O | metanol | 32,0 | 175,5 | 337,7 | 512,6 | 80,9 | 118,0 | 0,224 | 0,556 |
| 137 | C2HCl3 | trikloreten | 131,4 | 186,8 | 360,4 | 572,0 | 50,5 | 256,0 | 0,265 | 0,213 |
| 140 | C2H2 | acetilen | 26,0 | | 188,4 | 308,3 | 61,4 | 112,7 | 0,270 | 0,190 |
| 146 | C2H3Cl | vinil-klorid | 62,5 | 119,4 | 259,8 | 425,0 | 51,5 | 169,0 | 0,265 | 0,122 |
| 155 | C2H4 | etilen | 28,1 | 104,0 | 169,3 | 282,4 | 50,4 | 130,4 | 0,280 | 0,089 |
| 157 | C2H4Cl2 | 1,1-dikloretan | 99,0 | 176,2 | 330,5 | 523,0 | 50,7 | 236,0 | 0,275 | 0,240 |
| 158 | C2H4Cl2 | 1,2-dikloretan | 99,0 | 237,5 | 356,7 | 566,0 | 53,7 | 225,0 | 0,259 | 0,278 |
| 165 | C2H5Cl | etil-klorid | 64,5 | 136,8 | 285,5 | 460,4 | 52,7 | 199,0 | 0,274 | 0,191 |
| 168 | C2H6 | etan | 30,1 | 89,9 | 184,6 | 305,4 | 48,8 | 148,3 | 0,285 | 0,099 |
| 170 | C2H6O | etanol | 46,1 | 159,1 | 351,4 | 513,9 | 61,4 | 167,1 | 0,240 | 0,644 |
| 186 | C3H4 | propin | 40,1 | 170,5 | 249,9 | 402,4 | 56,3 | 164,0 | 0,275 | 0,215 |
| 191 | C3H5Cl3 | 1,2,3-triklorpropan | 147,4 | 258,5 | 429,0 | 651,0 | 39,5 | 348,0 | 0,250 | 0,310 |
| 193 | C3H6 | ciklopropan | 42,1 | 145,7 | 240,3 | 397,8 | 54,9 | 163,0 | 0,274 | 0,130 |
| 194 | C3H6 | propen | 42,1 | 87,9 | 225,5 | 364,9 | 46,0 | 181,0 | 0,274 | 0,144 |
| 196 | C3H6O | aceton | 58,1 | 178,2 | 329,2 | 508,1 | 47,0 | 209,0 | 0,232 | 0,304 |
| 204 | C3H7Cl | propil-klorid | 78,5 | 150,4 | 320,4 | 503,0 | 45,8 | 254,0 | 0,278 | 0,235 |
| 205 | C3H7Cl | izopropil-klorid | 78,5 | 156,0 | 308,9 | 485,0 | 47,2 | 230,0 | 0,269 | 0,232 |
| 206 | C3H8 | propan | 44,1 | 85,5 | 231,1 | 369,8 | 42,5 | 203,0 | 0,281 | 0,153 |
| 236 | C4H8 | 1-buten | 56,1 | 87,8 | 266,9 | 419,6 | 40,2 | 240,0 | 0,277 | 0,191 |
| 237 | C4H8 | cis-2-buten | 56,1 | 134,3 | 276,9 | 435,6 | 42,0 | 234,0 | 0,271 | 0,202 |
| 238 | C4H8 | trans-2-buten | 56,1 | 167,6 | 274,0 | 428,6 | 39,9 | 238,0 | 0,266 | 0,205 |
| 240 | C4H8 | izobuten | 56,1 | 132,8 | 266,2 | 417,9 | 40,0 | 239,0 | 0,275 | 0,194 |
| 253 | C4H9Cl | 1-klorbutan | 92,6 | 150,1 | 351,6 | 542,0 | 36,8 | 312,0 | 0,255 | 0,218 |
| 254 | C4H9Cl | 2-klorbutan | 92,6 | 141,8 | 341,4 | 520,6 | 39,5 | 305,0 | 0,280 | 0,300 |
| 258 | C4H1O | n-butan | 58,1 | 134,8 | 272,7 | 425,2 | 38,0 | 255,0 | 0,274 | 0,199 |
| 259 | C4H1O | izobutan | 58,1 | 113,6 | 261,4 | 408,2 | 36,5 | 263,0 | 0,283 | 0,183 |
| 311 | C5H12 | n-pentan | 72,2 | 143,4 | 309,2 | 469,7 | 33,7 | 304,0 | 0,263 | 0,251 |
| 312 | C5H12 | 2-metilbutan | 72,2 | 113,3 | 301,0 | 460,4 | 33,9 | 306,0 | 0,271 | 0,227 |

Tablica 2. Vrijednosti parametara interakcije $k_{ij}$ za Soave-Redlich-Kwong (SRK) i Peng-Robinson (PR) jednadžbe stanja

| | $CO_2$ | | $H_2S$ | | $N_2$ | | CO | |
|---|---|---|---|---|---|---|---|---|
| | SRK | PR | SRK | PR | SRK | PR | SRK | PR |
| metan | 0.093 | 0.092 | | | 0.028 | 0.031 | 0.032 | 0.03 |
| etilen | 0.053 | 0.055 | 0.085 | 0.083 | 0.08 | 0.086 | | |
| etan | 0.136 | 0.132 | | | 0.041 | 0.052 | -0.028 | -0.023 |
| propen | 0.094 | 0.093 | | | 0.090 | 0.090 | | |
| propan | 0.129 | 0.124 | 0.088 | 0.088 | 0.076 | 0.085 | 0.016 | 0.026 |
| izobutan | 0.128 | 0.120 | 0.051 | 0.047 | 0.094 | 0.103 | | |
| n-butan | 0.143 | 0.133 | | | 0.07 | 0.08 | | |
| izopentan | 0.131 | 0.122 | | | 0.087 | 0.092 | | |
| n-pentan | 0.131 | 0.122 | 0.069 | 0.0630 | 0.088 | 0.100 | | |
| n-heksan | 0.118 | 0.110 | | | 0.150 | 0.150 | | |
| n-heptan | 0.110 | 0.110 | | | 0.142 | 0.142 | | |
| n-dekan | 0.130 | 0.114 | | | | | | |
| ugljik(IV)-oksid | | | 0.099 | 0.097 | -0.032 | -0.017 | | |
| cikloheksan | 0.129 | 0.105 | | | | | | |
| benzen | 0.077 | 0.077 | | | 0.153 | 0.164 | | |
| toluen | 0.113 | 0.106 | | | | | | |

**SIMBOLI**

| | |
|---|---|
| $a$ | parametar u RK, SRK ili PR jednadžbi stanja |
| $A$ | parametar u RK, SRK ili PR jednadžbi stanja |
| $b$ | parametar u RK, SRK ili PR jednadžbi stanja |
| $B$ | parametar u RK, SRK ili PR jednadžbi stanja |
| $k$ | parametar interakcije u SRK ili PR jednadžbi stanja |
| $M$ | molarna masa (g $mol^{-1}$) |
| nKo | broj komponenti |
| $p$ | tlak (bar) |
| $R$ | opća plinska konstanta (bar $cm^3$ $mol^{-1}$ $K^{-1}$) |
| $T$ | termodinamička temperatura (K) |
| $v$ | volumen ($cm^3$ $mol^{-1}$) |
| $y$ | molarni udio |
| $z$ | koeficijent kompresibilnosti |
| $\alpha$ | parametar u SRK ili PR jednadžbi stanja |
| $\phi$ | koeficijent fugacitivnosti |
| $\varphi$ | parcijalni koeficijent fugacitivnosti |
| $\kappa$ | parametar u SRK ili PR jednadžbi stanja |
| $\omega$ | Pitzerov koeficijent acentričnosti |
| $\Omega_a$ | konstanta u RK, SRK ili PR jednadžbi stanja |
| $\Omega_b$ | konstanta u RK, SRK ili PR jednadžbi stanja |

Podoznake

| | |
|---|---|
| c | kritična veličina |
| i, j | oznaka komponente |
| id | idealni plin |
| m | mixture, smjesa |
| pc | pseudokritična veličina |
| r | reducirana veličina |
| sl | solid-liquid, ravnoteža krutina-kapljevina |
| vl | vapor-liquid, ravnoteža para-kapljevina |