

CUBIC EQUATIONS OF STATES

Name (year)	Equation of State (EOS)	a	b	θ
van der Waals (1873)	$P = \frac{RT}{V - b} - \frac{a}{V^2}$	$0.421875 R^2 T_c^2 / P_c$	$0.125 RT_c / P_c$	---
Redlich/Kwong (1949)	$P = \frac{RT}{V - b} - \frac{a}{T^{1/2} V(V + b)}$	$0.42748 R^2 T_c^{2.5} / P_c$	$0.08664 RT_c / P_c$	---
Soave/Redlich/Kwong (1972)	$P = \frac{RT}{V - b} - \frac{\theta}{V(V + b)}$	$0.42748 R^2 T_c^2 / P_c$	$0.08664 RT_c / P_c$	$a[1+(0.480+1.574\omega - 0.176\omega^2)(1-T_r^{1/2})]^2$
Peng/Robinson (1976)	$P = \frac{RT}{V - b} - \frac{\theta}{V^2 + 2bV - b^2}$	$0.45724 R^2 T_c^2 / P_c$	$0.07780 RT_c / P_c$	$a[1+(0.37464+1.54226\omega - 0.26992\omega^2)(1-T_r^{1/2})]^2$