

$$\alpha = \frac{1}{V} \left(\frac{\partial V}{\partial T} \right)_P = \frac{3aT^3}{V} \quad \text{--- (1)}$$

كبر 8 :

$$\beta_T = -\frac{1}{V} \left(\frac{\partial V}{\partial P} \right)_T = \frac{b}{V} \quad \text{--- (2)}$$

الحاد معادلة الحالة :

من (1) :

$$\left(\frac{\partial V}{\partial T} \right)_P = 3aT^3$$

$$\partial V = 3aT^3 dT$$

$$V = \frac{3}{4} aT^4 + f(P)$$

من (2) :

$$\frac{\partial V}{\partial P} = -b = \frac{\partial f(P)}{\partial P}$$

وسيق :

$$f(P) = -bP + K$$

وسيق معادلة الحالة :

$$\boxed{V = \frac{3}{4} aT^4 - bP + K}$$