

Lecture notes

vrijdag 24 april 2020 09:21

$$\text{Expansivity } \beta = \frac{1}{v} \left(\frac{\partial v}{\partial T} \right)_P$$

Also sometimes called the coefficient of volume expansion

$$\text{Compressibility } \kappa = -\frac{1}{v} \left(\frac{\partial v}{\partial P} \right)_T$$

For an ideal gas, $v = \frac{RT}{P}$

Thus, for an ideal gas, $\beta = \frac{1}{T}$ and $\kappa = \frac{1}{P}$

For a solid or a liquid, approximately, β and κ are nearly constant with T and P .

Equation of state: $v = v_0(1 + \beta(T - T_0) - \kappa(P - P_0))$

Volume increases linearly with T and decreases linearly with P .