

W4-2-5 Helmholtz energy 5

Consider the total differential $da = \left(\frac{\partial a}{\partial T}\right)_v dT + \left(\frac{\partial a}{\partial v}\right)_T dv$. What variable is represented by $\left(\frac{\partial a}{\partial v}\right)_T$?

From $da = -Pdv - sdT$ and $da = \left(\frac{\partial a}{\partial T}\right)_v dT + \left(\frac{\partial a}{\partial v}\right)_T dv$ it can be seen that:

$$\left(\frac{\partial a}{\partial v}\right)_T = -P$$