2.2) Specific Heats

Specific Heats of a Simple Compressible Substance

$$c_v = \left(\frac{\partial u}{\partial T}\right)_v \qquad u(T,v)$$

Partial Derivative

$$c_p = \left(\frac{\partial h}{\partial T}\right)_p \qquad h(T,p)$$

Specific Heat Ratio

$$k = \frac{c_p}{c_v}$$

Specific Heat of an Incompressible Substance (Solids, Liquids)

$c_v = c_p = c$

$$u_2 - u_1 = \int_{T_1}^{T_2} c\,dT$$

$h = u + pv$

$$h_2 - h_1 = \int_{T_1}^{T_2} c\,dT + v(p_2 - p_1)$$

If c is constant

$$u_2 - u_1 = c(T_2 - T_1)$$

$$h_2 - h_1 = c(T_2 - T_1) + v(p_2 - p_1)$$