HW #11

12.8) $\frac{100°C}{156°I - 25°I} = 0.76\ °C/°I$

$(58°I)(0.76°C/°I) = \underline{25°C}$

12.16.) $\Delta L_q = \alpha_q L_q \Delta T$ $\quad \Delta L_q = \Delta L_L$ $\quad L_q$?

$\Delta L_L = \alpha_L L_L \Delta T$

$\alpha_q L_q \cancel{\Delta T} = \alpha_L L_L \cancel{\Delta T}$ $\quad L_q = \frac{\alpha_L L_L}{\alpha_q} = \frac{29*10^{-6}\ 1/°C}{0.5*10^{-6}\ 1/°C}(0.10)$

$\underline{L_q = 5.8m}$

12.30.) 1.5 L at 97.0°C $\quad$ Liquid?

1.3832 L at 15.0°C

$\beta V \Delta T = \Delta V$ $\quad \beta = \frac{\Delta V}{V \Delta T} = 9.5*10^{-4}\ 1/°C \Rightarrow \underline{\text{gasoline}}$

12.50.) Ag: ~~c =~~ $c = 235\ J/kg°C$ $\quad m = 0.039\ kg$ $\quad L = 0.15m$ $\quad \Delta L = 4.3*10^{-4}m$

Q? $\quad \alpha L \Delta T = \Delta L$ $\quad \Delta T = \frac{\Delta L}{\alpha L}$ $\quad \alpha = 19*10^{-6}\ 1/°C$

$Q = cm\Delta T = cm\frac{\Delta L}{\alpha L} = \underline{1400\ J}$

12.58.) $-10°$ ice $\quad L_{ice} = 33.5*10^4\ J/kg$ $\quad m = 10\ kg$ $\quad Q_{in} = 4.11*10^6\ J$

$Q_i = cm\Delta T = (2*10^3)(10)(10) = 2*10^5\ J$

$Q_{MELT} = mL = 10(33.5*10^4) = 33.5*10^5\ J$

$Q_{Left} = 4.11*10^6\ J - 3.55*10^6\ J = 0.56*10^6\ J = cm\Delta T$

$\Delta T = \frac{Q_{Left}}{cm} = \frac{0.56*10^6}{(4186)(10)} \Rightarrow \underline{\Delta T = 13.6°C}$