Solution

**Quiz 1 – PHN241** **Name**_____ ☐ **Pledged**

$Q = mc\Delta T$ $T_K = T_C + 273$ $c_{glass} = 840J/(kgK)$ $c_{water} = 4190J/(kgK)$

**Please show all work!**

A 345 g glass mug at 20.0°C is filled with 125 g of water at 96.0°C. Assuming no losses to the outside air what is the final temperature of the mug?

$$Q_g + Q_w = 0$$

$$m_g c_g \Delta T_g + m_w c_w \Delta T_w = 0$$

$$(.345\,kg)(840\,J/kg\,K)(T_F - 293K)$$

$$+ (.125\,kg)(4190\,J/kg\,K)(T_F - 369K) = 0$$

$$-8.49\times10^4\,J + \left(289.8\frac{J}{K}\right)T_F$$

$$-1.932\times10^5\,J + \left(523.75\frac{J}{K}\right)T_F = 0$$

$$\left(813.5\frac{J}{K}\right)T_F = 2.78\times10^5\,J$$

$$T_F = 342\,K$$

$$= 69^\circ C$$