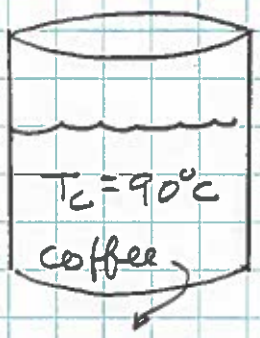

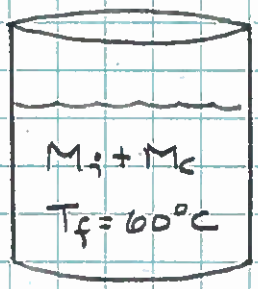

$$V_c = 300\,mL = 0.3\,L\left(\frac{10^{-3}\,m^3}{1\,L}\right) = 3\times10^{-4}\,m^3$$

$$M_c = \rho_{water} V_c = \left(1000\frac{kg}{m^3}\right) V_c = 0.3\,kg$$

Now: Q_{net} = Q(to warm ice to 0°C) + Q(to melt ice at 0°C) + Q(to warm water that was ice to T_f) + Q(to cool coffee to T_f) = 0

So:

$$Q_{net} = M_i c_i (0° - T_i) + M_i L_f + M_i c_w (T_f - 0°C) + M_c c_w (T_f - T_c) = 0$$

$$M_i(-c_i T_i + L_f + c_w T_f) = -M_c c_w (T_f - T_c)$$

$$M_i = \frac{-M_c c_w (T_f - T_c)}{(-c_i T_i + L_f + c_w T_f)}$$

$c_w = 4190\ J/kg\,°C$ $\quad c_i = 2090\ \frac{J}{kg\,°C}$

$L_f = 3.33\times10^5\ J/kg$

So:

$$M_i = 0.0602\,kg = \underline{60.2\,g}$$