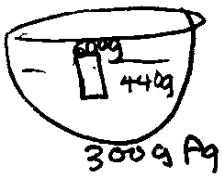
④



$\}$ 40°C ⇒ 100°C ‖ 10g → steam

$L_{boil} = 2256\ kJ/kg = 2256\times10^{3}\,(4.186\ cal)/10^{3}\,g = 539\ \frac{cal}{g}$

[10] a) Heat transfer to water Q_W

$= c_w m_w \Delta T + L_V \cdot m_{Boil}$

$= (1\ cal/g\,°C)^{*}(440g)(+60°C) + 539\ \frac{cal}{g}(10g)$

$= 26.4\ kcal + 5.4\ kcal$

$= 31.8\ kcal \quad (133\ kJ)$

[5] b) ~~Heat~~ transferred to bowl

$Q_b = c_b m_b \Delta T = \left(0.0764\ \frac{cal}{g\,K}\right)(300g)(60°C) = 1.02\ kcal \quad (4.3\ kJ)$

[10] c) $c_c m_c \Delta T = Q_W + Q_B$

Heat from cylinder = Heat to water + Heat to bowl

$c_c m_c (T_A - T_f) = Q_W + Q_B$

$T_A = T_f + \frac{Q_W + Q_B}{c_c m_c} = \frac{29.1\ kcal + 1.02\ kcal}{\left(0.0764\ \frac{cal}{g\,K}\right)(600g)} + 100°C$

$= 100°C + 902°C$

$= 1002°C$

* the specific heat of water is the definition of the calorie (amt of heat to raise 1gm of water 1K)