(D)

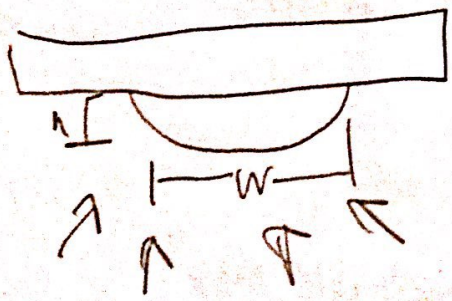
$$q''_{max} = C h_{fg} \rho_v \left[\frac{\sigma g (\rho - \rho_v)}{\rho_v^2} \right]^{\frac{1}{4}}$$

$$q''_{max} = .131 \cdot 2257 \cdot .5956 \left[\frac{56.9 \times 10^{3} \cdot 9.8 (957.9 - .5956)}{.5956^2} \right]$$

$$q''_{max} = 1.102 \ W/m^2$$

the C value for boiler 2 must be greater and for boiler 3 must be smaller so the shapes and surfaces are different

problem 2



h = .05 M
W = .10 M
T_s = 94°C
T_∞ = 100°C
humid = 100%

(A) $h = \frac{q}{\Delta T}$ uses Nusselt film theory

$$h'_{fg} = h_{fg} + .68 c_{p,l} (100 - 94) = 19369.91$$

2257

4193

$$P = \frac{k_1 \cdot L' \Delta T}{\mu_1 \cdot h'_{fg} (\nu_1^2/g)^{1/3}} \rightarrow \frac{.668 \cdot .1 \cdot 6}{375\times10^{-6} \cdot 19369.44 (\frac{385\times10^{-9}}{7.8})^{1/3}}$$

if $P \leq 15.8$

use $Nu_L = \frac{h_L (\nu_1^2/g)^{1/3}}{k_1} = .943 P^{-1/4}$

if $15.8 \leq P < 2530$

use $Nu_L = \frac{1}{P}(.68P + .89)^{.82}$

if $P > 2530$

$Nu_L = \frac{1}{P}\left[(.024P - 53)^{1/2} + 89\right]^{4/3}$

A find h_L

$$h_L = \frac{Nu_L k_1}{(\nu_1^2/g)^{1/3}}$$

B Redoegn with