1. $\Delta G = -\Delta G_v \cdot \frac{4}{3}\pi r^3 + 4\pi r^2 \cdot \gamma$

$\frac{\partial \Delta G}{\partial r} = -4\pi r^2 \Delta G_v + 8\pi r \gamma = 0$

$r = \frac{2\gamma}{\Delta G_v}$, $\Delta G = \frac{16\pi\gamma^3}{3\Delta G_v^2}$, $\left(I = I_0 \exp\left(-\frac{\Delta G^*}{RT}\right)\right)$

(a) $\ln I = \ln f_0 N_0 - \frac{\Delta G^*}{RT}$

$-23.8\times10^3 = -\frac{\Delta G^*}{k}$ ∴ $\frac{1}{k}\times\frac{16\pi\gamma^3}{3(\Delta G_v)^2} = 23.8\times10^3$

$\gamma^3 = 1.96\times10^{-4}$, $\gamma = 0.06\,J/m^2$

(b) $r^* = \frac{2\gamma}{\Delta G_v} = 1.14\times10^{-9}\,m$ (대입)

(c) $-nv\Delta G_v + (36\pi)^{\frac{1}{3}} n^{\frac{2}{3}} v^{\frac{2}{3}} \gamma$

$\frac{\partial G}{\partial n} = 0 \rightarrow n^* = \frac{32\pi}{3v}\left(\frac{\gamma}{\Delta G_v}\right)^3$

$-v\Delta G_v + (36\pi)^{\frac{1}{3}} \frac{2}{3} n^{-\frac{1}{3}} v^{\frac{2}{3}} \gamma = 0$

$\frac{v\Delta G_v}{\frac{2}{3}(36\pi)^{\frac{1}{3}} v^{\frac{2}{3}} \gamma} = n^{-\frac{1}{3}}$

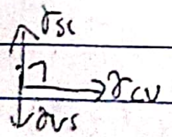
$n^* = \left(\frac{32\pi}{3v}\right)\left(\frac{\gamma}{\Delta G_v}\right)^3 \rightarrow v = 1.432\times10^{-29}$

$n =$ 대입 → 464개

2.

$\Delta G = -\Delta G_v \cdot V + \sum A_i \gamma_i$

$= -\Delta G_v \cdot l^2 h + l^2(\gamma_{sc} - \gamma_{vs}) + \gamma_{cv}(l^2 + 4lh)$



$\gamma_{sc} = \gamma_{vs}$ $(\theta = 90)$ this term goes to (0)

$\Delta G = -\Delta G_v \cdot l^2 h + \gamma_{cv}(l^2 + 4hl)$

$l^* = \frac{4\gamma_{cv}}{\Delta G_v}$, $h^* = \frac{2\gamma_{cv}}{\Delta G_v}$, $l^* = 2h^*$

$\Delta G^* = -\Delta G_v 4h^3 + \gamma_{cv}(12h^2)$

$\Delta G^* = \frac{16\gamma_{cv}^3}{(\Delta G_v)^2}$, $l^* = \frac{4\gamma_{cv}}{\Delta G_v}$, $h^* = \frac{2\gamma_{cv}}{\Delta G_v}$