1. (a) $\frac{\partial c}{\partial t} = \tilde{D}\frac{\partial^2 c}{\partial x^2}$, $\frac{\partial c}{\partial t} = R(\beta)(12\%)e^{R(\beta)t}\cos\beta x$

$\frac{\partial^2 C}{\partial x^2} = -\beta^2 (12\%) e^{R(\beta)t}\cos\beta x$

$R(\beta)(12\ at\%\ Au)\exp(R(\beta)t)\cos\beta x = -\tilde{D}\beta^2(12\ at\%\ Au)\exp(R(\beta)t)\cos\beta x$

$\rightarrow R(\beta) = -\tilde{D}\beta^2$, $C_{max} - C_{min} = 2\times(12\ at\%\ Au)\exp(R(\beta)t) = 2\ at\%\ Au$

$12\exp(R(\beta)t) = 1$ → t 에 대해 정리하면 $t = \left(\frac{\ln(12)}{(10^{-24}\ [illegible])\left(\frac{\pi}{[illegible]}\right)}\right)^2$ = ~~260375~~

25177

(b)

$\frac{\partial c}{\partial t} = \tilde{D}\frac{\partial^2 c}{\partial x^2} - \frac{2K\tilde{D}}{f''}\frac{\partial^4 c}{\partial x^4}$, $\frac{\partial^4 c}{\partial x^4} = \beta^4(12\ at\%\ Au)\exp(R(\beta)t)\cos\beta x$

$R(\beta)(12\ at\%\ Au)\exp(R(\beta)t)\cos\beta x = -\tilde{D}\beta^2(12\%)\cos\beta x\exp(R(\beta)t)$

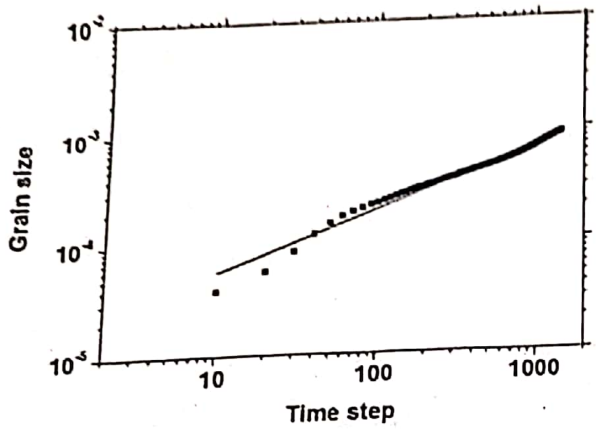
$- \frac{2K\tilde{D}}{f''}\beta^4(12\ at\%\ Au)\cos\beta x\exp(R(\beta)t)$, $R(\beta) = -\tilde{D}\beta^2 - \frac{2K\tilde{D}}{f''}\beta^4$

$$t = \frac{\ln(12)}{\tilde{D}\beta^2 + \frac{2K\tilde{D}}{f''}\beta^4} = 28000\,s$$

(C) negative gradient energy coefficient를 가지는 fluctuating 구간에 대하여 불안정한 phase로 인해 nucleation이 일어난다. 계면에너지를 고려하여 (b) 일 것이고 Ag-Au system은 spinodal decomposition 을 더 선호한다.

CamScanner로 스캔하기

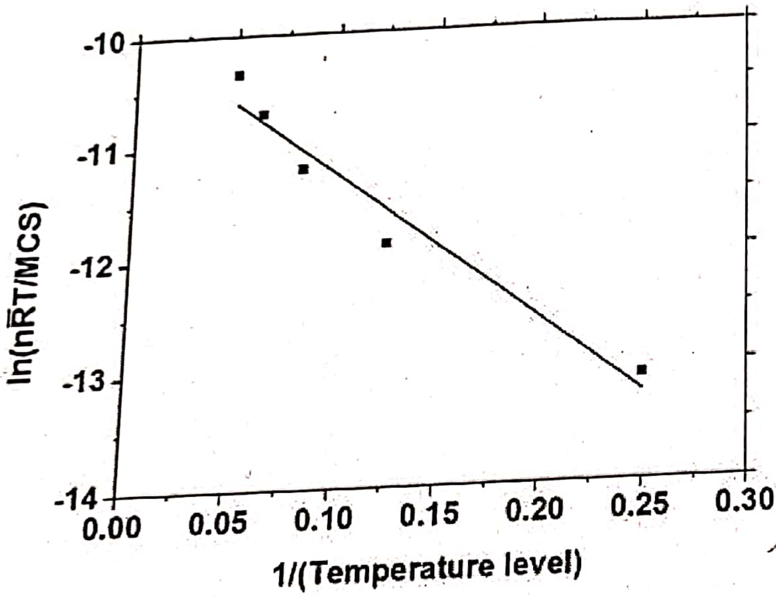
2



「Grain 64000
T level 4

$y = 1.64 \cdot 10^{-5} x^{0.5452}$

└ $\bar{R} = kt^n$ 의 relationship 성립



(b) $\frac{dR}{dt}$

$u = \lambda v = \lambda \nu_0 e^{-\frac{\Delta G}{RT}}(1 - e^{-\frac{\Delta G}{RT}})$

$\approx \nu_0 e^{-\frac{\Delta G}{RT}} \frac{\Delta G_{de}}{RT}$

$u = \frac{dR}{dt} = nkt^{n-1} = \lambda \nu_0 e^{-\frac{\Delta G}{RT}} \frac{\Delta G}{RT}$

$\ln(T n k t^{n-1})$

$= \ln C - \frac{\Delta G}{RT}$

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Time 500

$\frac{\Delta G}{R}$ (기울기) = 13.2