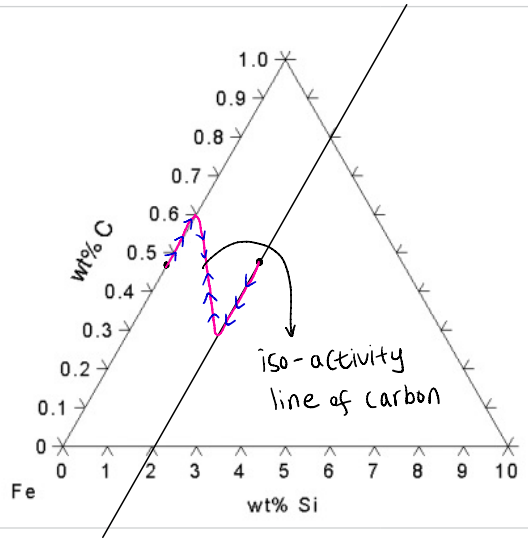
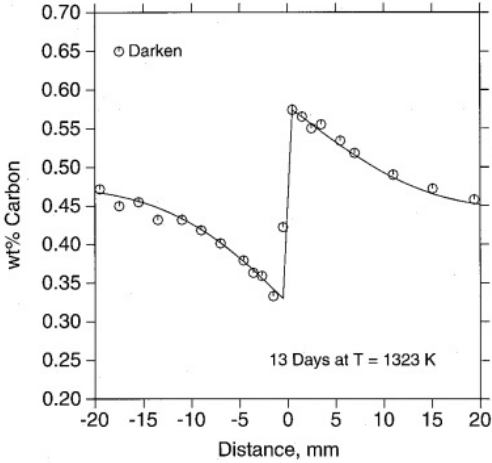
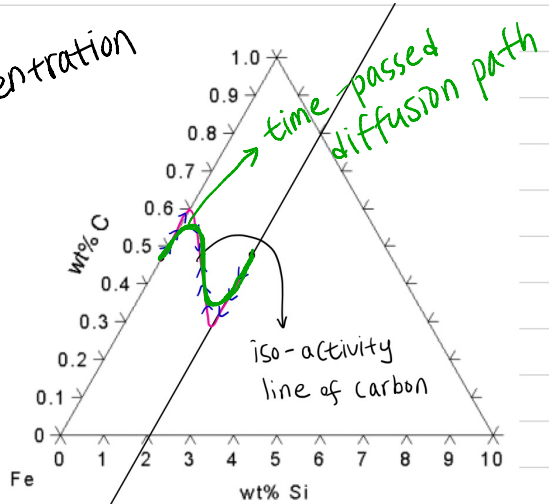
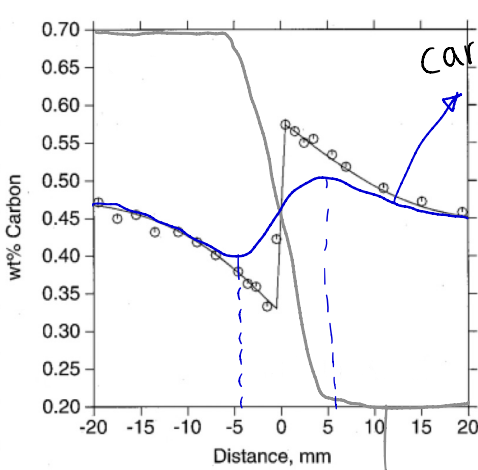


1. Diffusion path at 13 days



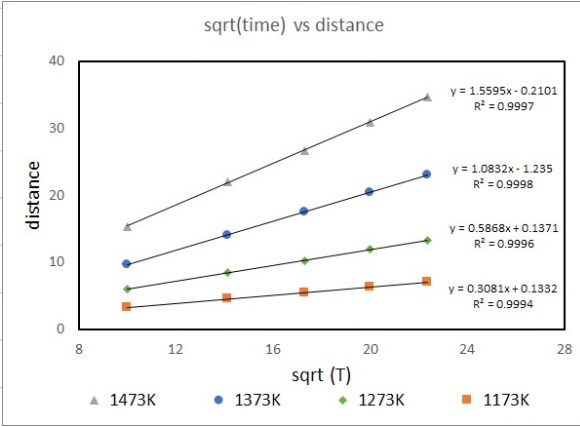
time passed more



Si Concentration

## 2. (a) Injection distance and injection time

$x = \sqrt{Dt}$  이므로 Distance vs  $(\text{time})^{0.5}$  를 plot

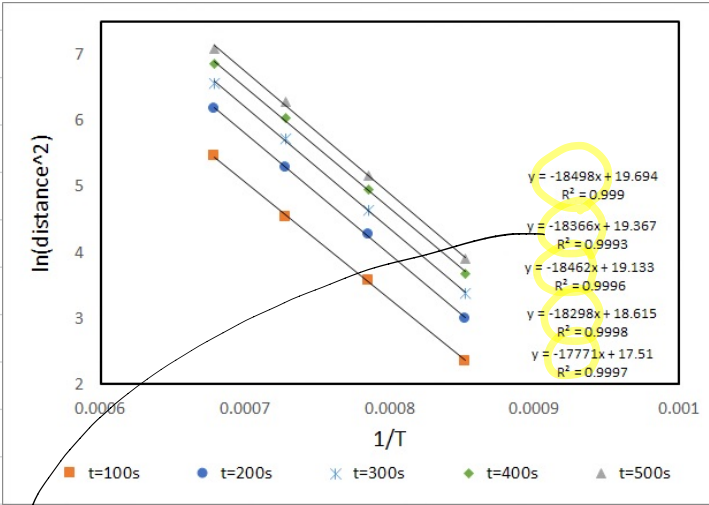


모든 온도조건 계산 결과  
 Distance  $\propto$   $(\text{time})^{0.5}$  이다

(b) Injection distance 와 Temperature

$$x = \sqrt{Dt} = \sqrt{D_0 \exp\left(-\frac{Q}{RT}\right)t} \quad \therefore \ln x^2 = -\frac{Q}{RT} + \ln D_0 t$$

$\ln(\text{Distance}^2)$  VS  $1/T$  plot



모든 시간 조건 결과

$\ln(\text{Distance}^2) \propto 1/T$

(c) (b)의 식  $\ln x^2 = -\frac{Q}{RT} + \ln D_0 t$  에서

(plot한 그래프의 기울기)  $\times (-8.314) = \text{activation } E$  이다

5개 fitting 결과 기울기 평균 =  $-18219$

$(-18219) \times (-8.314) = 151971 \text{ J/mol}$

문제의 주어진 activation E와의 상대오차

$(151971 - 147727) / 147727 \times 100 (\%) = 2.9\%$