

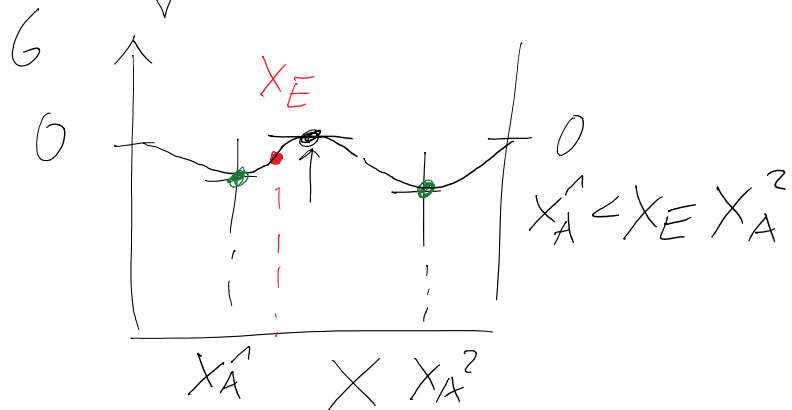
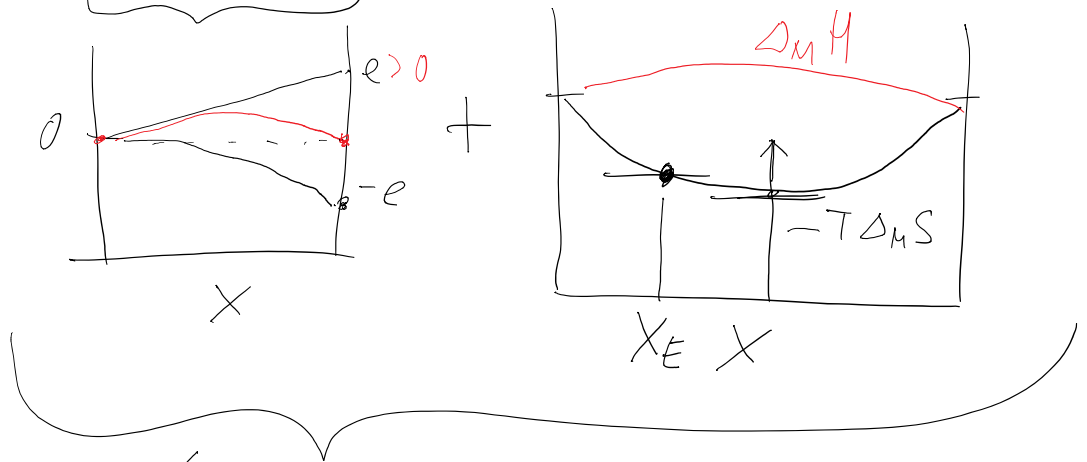
Mischungslücke

$$\Delta_M G = \Delta_M H - T \Delta_M S$$

$$= e X_A \cdot X_A + RT (X_A \ln X_A + X_B \ln X_B)$$

$$X = X_A, X_B = 1 - X$$

$$\Delta_M G = \underbrace{e \cdot x(1-x)} + \underbrace{RT (x \ln x + (1-x) \ln (1-x))}$$



$$\frac{\partial G}{\partial x} = e - 2ex + RT \ln x + \cancel{RT \cdot x \frac{1}{x}}$$

$$+ RT (-1) \ln (1-x)$$

$$+ \cancel{RT (1-x) \frac{1}{1-x}} (-1)$$

$$\frac{\partial G}{\partial x} = e - 2ex + RT \ln x - RT \ln (1-x) \stackrel{!}{=} 0$$

$$\hookrightarrow e(1-2x) + RT \ln \left(\frac{x}{1-x} \right) \stackrel{!}{=} 0$$

∂x

$\frac{\partial^2 G}{\partial x^2} < 0$ für Maximum

$e(1-2x) + RT \ln\left(\frac{x}{1-x}\right) = 0$

$\hookrightarrow X_A^1$ und X_A^2 numerisch

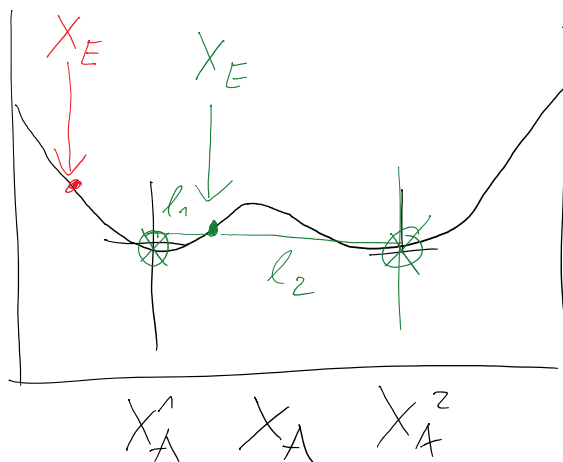
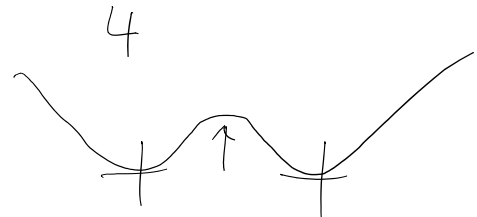
$\frac{\partial^2 G}{\partial x^2} = -2e + RT \frac{1}{x} - RT \frac{1}{(1-x)} (-1) < 0$

$-2e + RT \left(\frac{1}{x} + \frac{1}{1-x} \right) < 0$

$\frac{2e}{RT} > \frac{1}{x} + \frac{1}{1-x} = \frac{1-x+x}{x(1-x)} = \frac{1}{x(1-x)}$

$e > \frac{1}{2} RT \frac{1}{x(1-x)}$
↑
max. $x = 0.5$

$e > 2 \cdot RT$



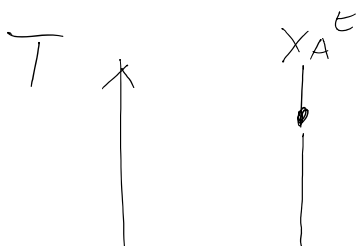
2 Phasen mit Zusammensetzung X_A^1 und X_A^2

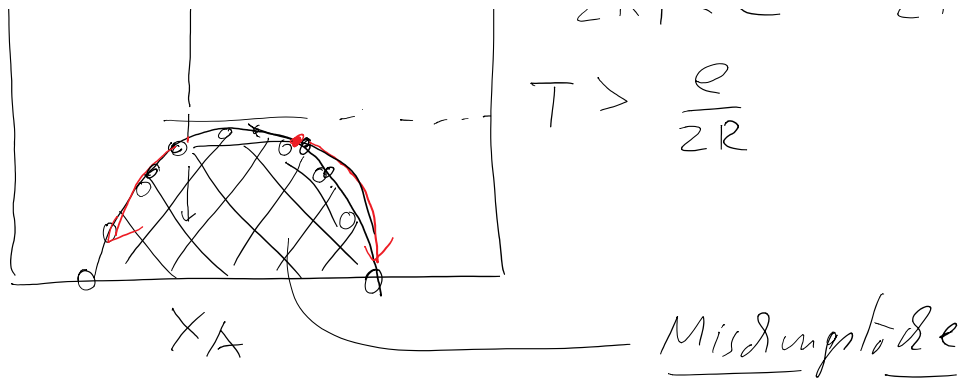
$\frac{n_{A1}}{n_{A2}} = \frac{l_2}{l_1}$ Hebelgesetz

$n_{A1} + n_{A2} = n_{AE}$

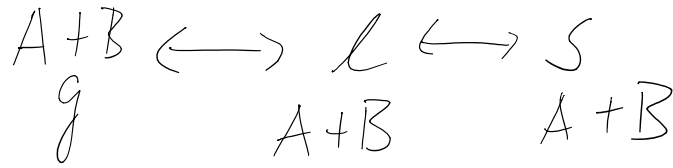
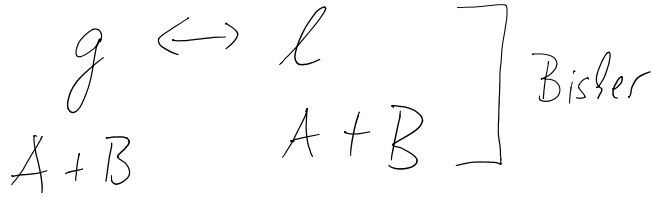
$2RT < e$ $2RT > e$

$T \searrow e$

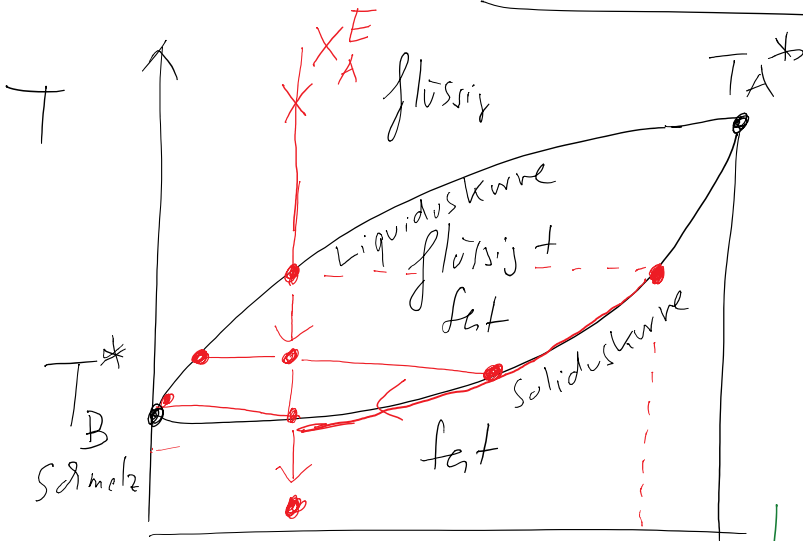




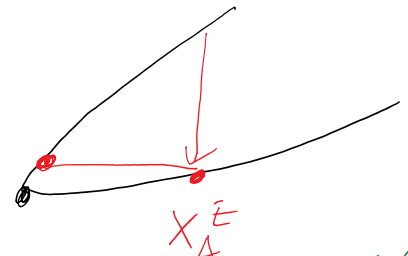
Schmelzdiagramme



bei hohem
äußeren Druck: $\left[\begin{array}{c} l \leftrightarrow s \\ A+B \quad A+B \end{array} \right]$

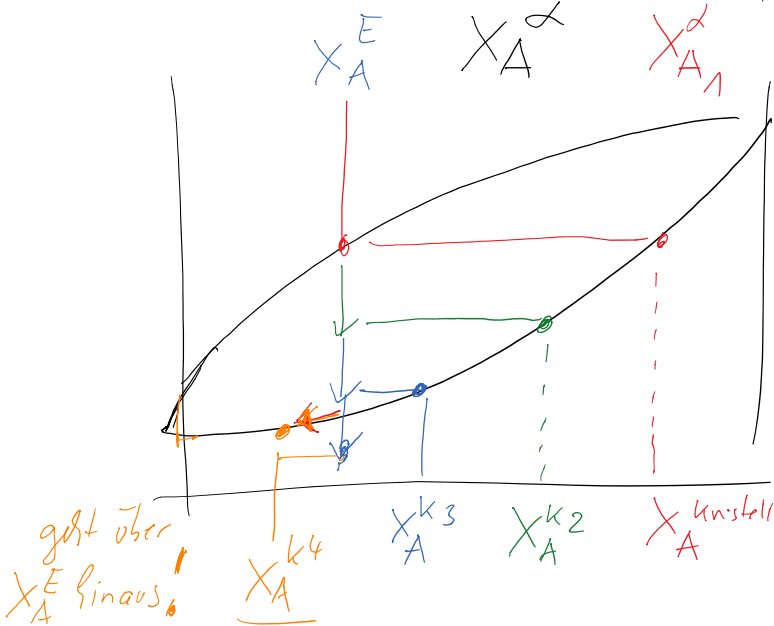


$l, s:$
 $A-A = B-B = A-B$

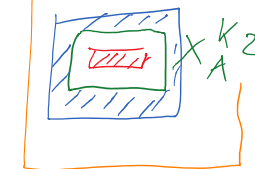


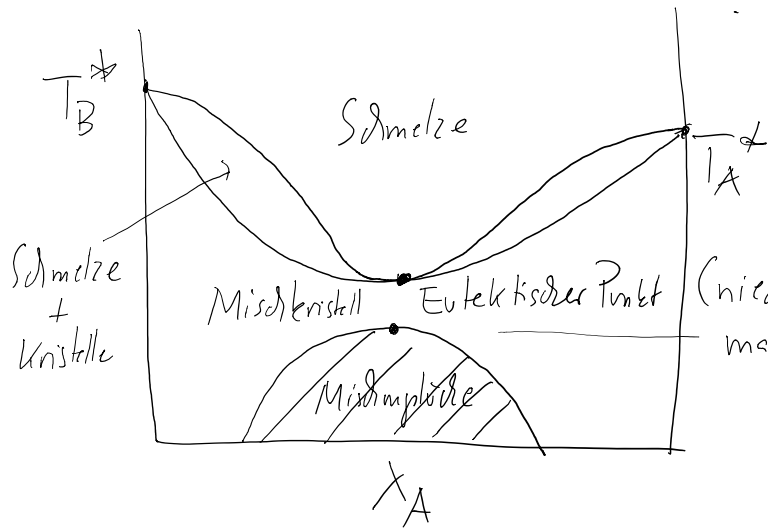
langsameres Abkühlen, d.h.
zu jedem Zeitpunkt ist
Flüssigkeit + Feststoff im TD-
Gleichgewicht

ansonsten: Mischkristall mit
unterschiedl. Zusammensetzung
 X_A^{k4} (innen/außen)



geht über
 X_A^E hinaus





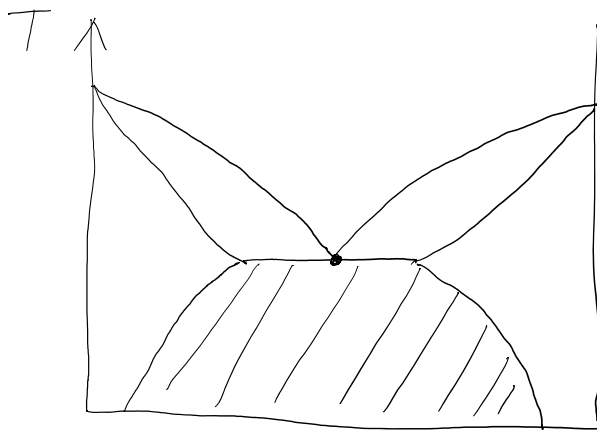
nicht ideale Mischungen

$$A-B < A-A, B-B$$

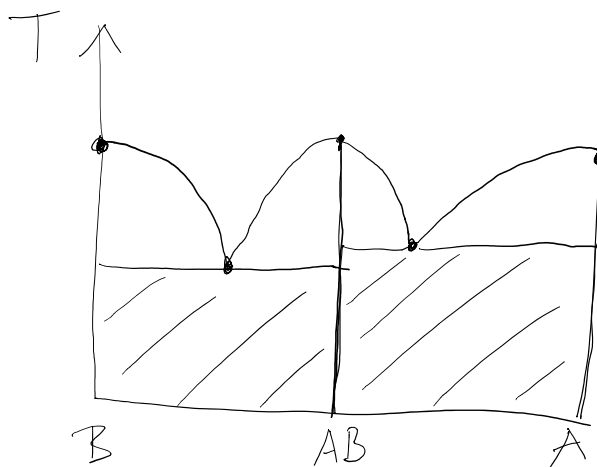
$$e > 0$$

(niedrigster Schmelzpunkt T_S^{\min})

$$\text{max. } T \text{ für Mischkristalle } T_{ML}^{\max} = \frac{e}{2R}$$



$$\text{falls } T_{ML}^{\max} \geq T_{\text{Schmelz}}^{\min}$$



falls zw. A und B eine Verbindung AB existiert