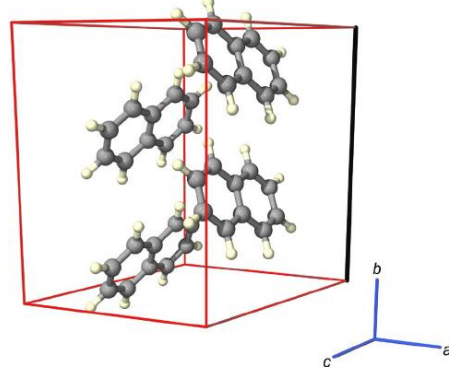


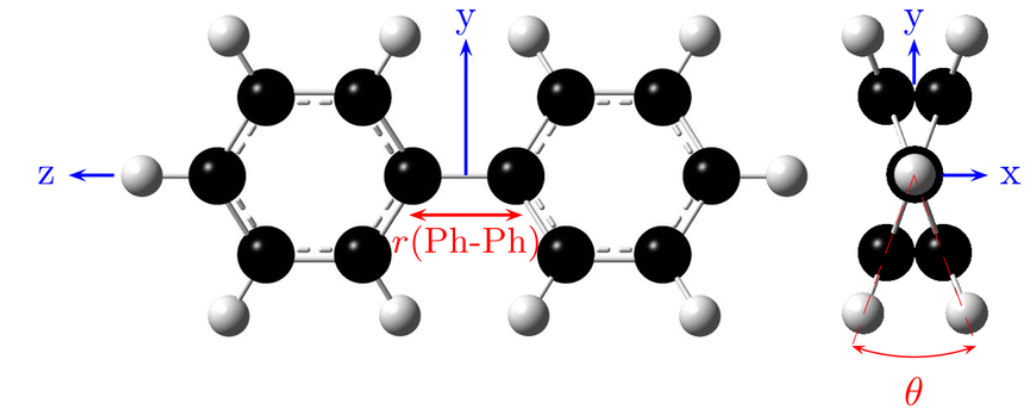
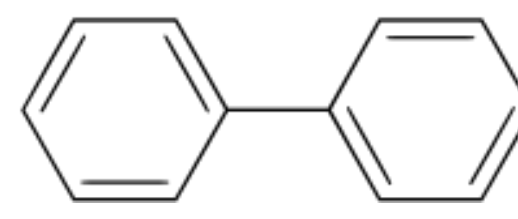
SÓLID-LIQUID EQUILIBRIUM: BINARY SYSTEM BIPHENYL/NAPHTHALENE



Naphthalene



Biphenyl



Phase Diagram

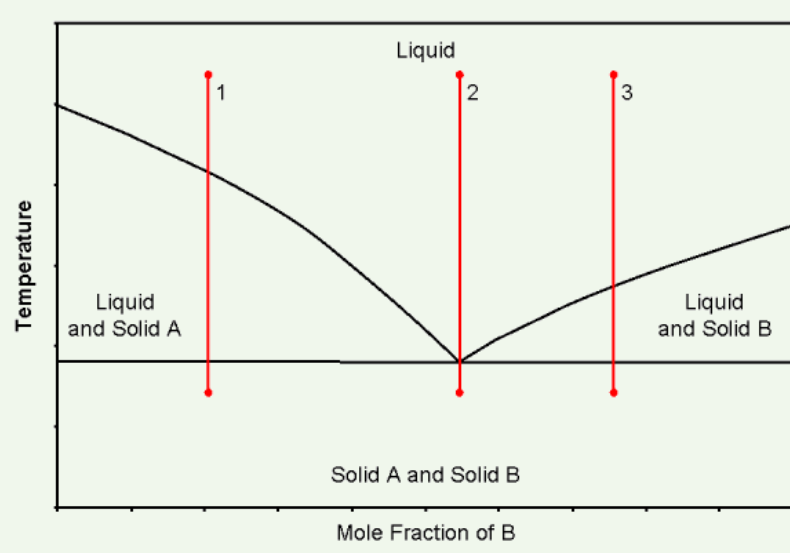


Figure 1. Generalized solid-liquid phase diagram for a binary system comprised of compound A and compound B. The isopleths labeled 1, 2 and 3 correspond to the cooling curves shown in Fig. 2

Cooling curves

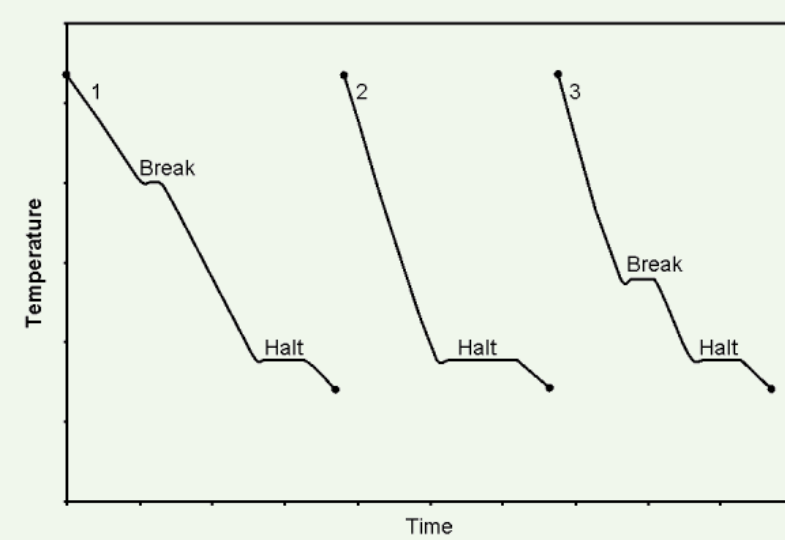


Figure 2. Cooling curves isopleths shown in Fig. 1. 1 is for a mixture rich in compound A, while cooling curve 3 is for a mixture rich in compound B, and cooling curve 2 corresponds to a mixture with the eutectic composition.

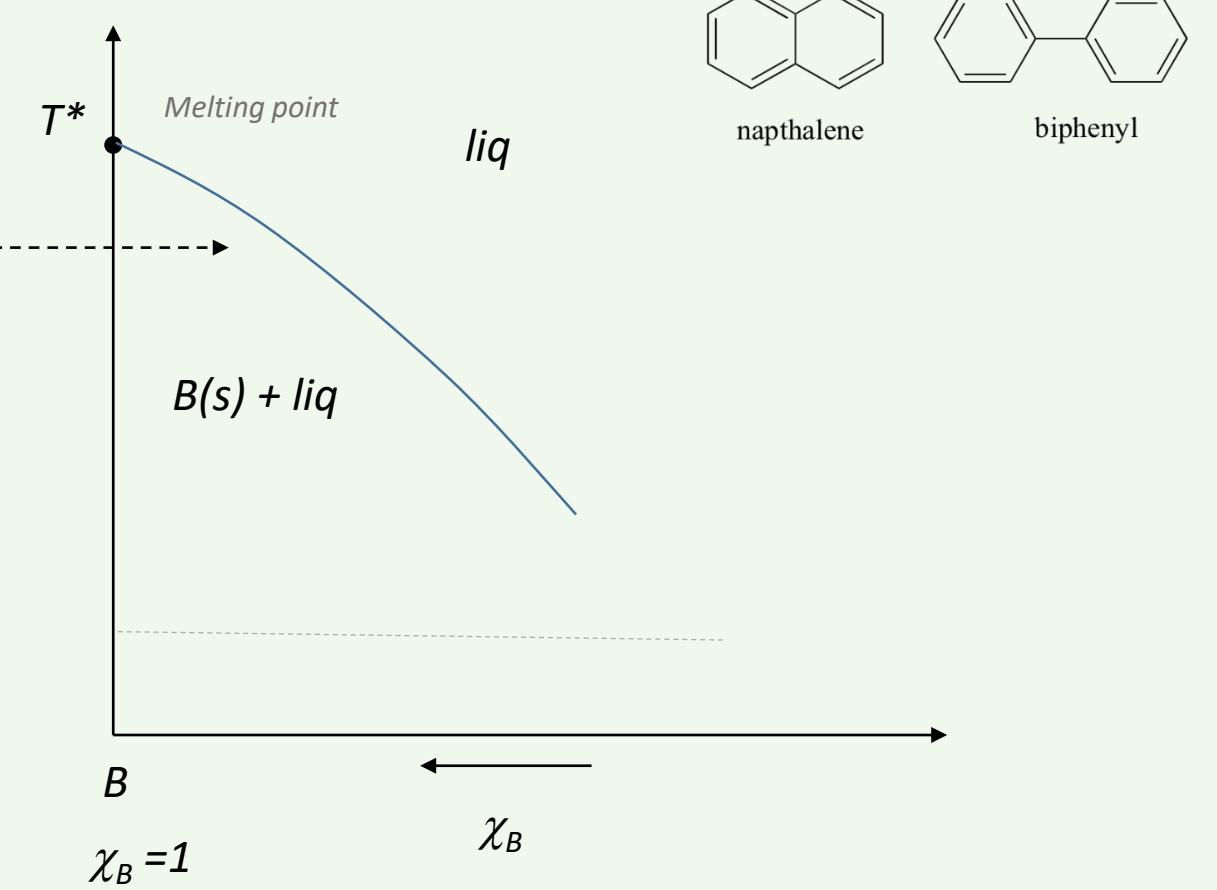
Schroder-van Laar equation

$$T = \left(\frac{1}{T^*} - \frac{R \ln \chi_B}{\Delta_{fus}H} \right)^{-1}$$

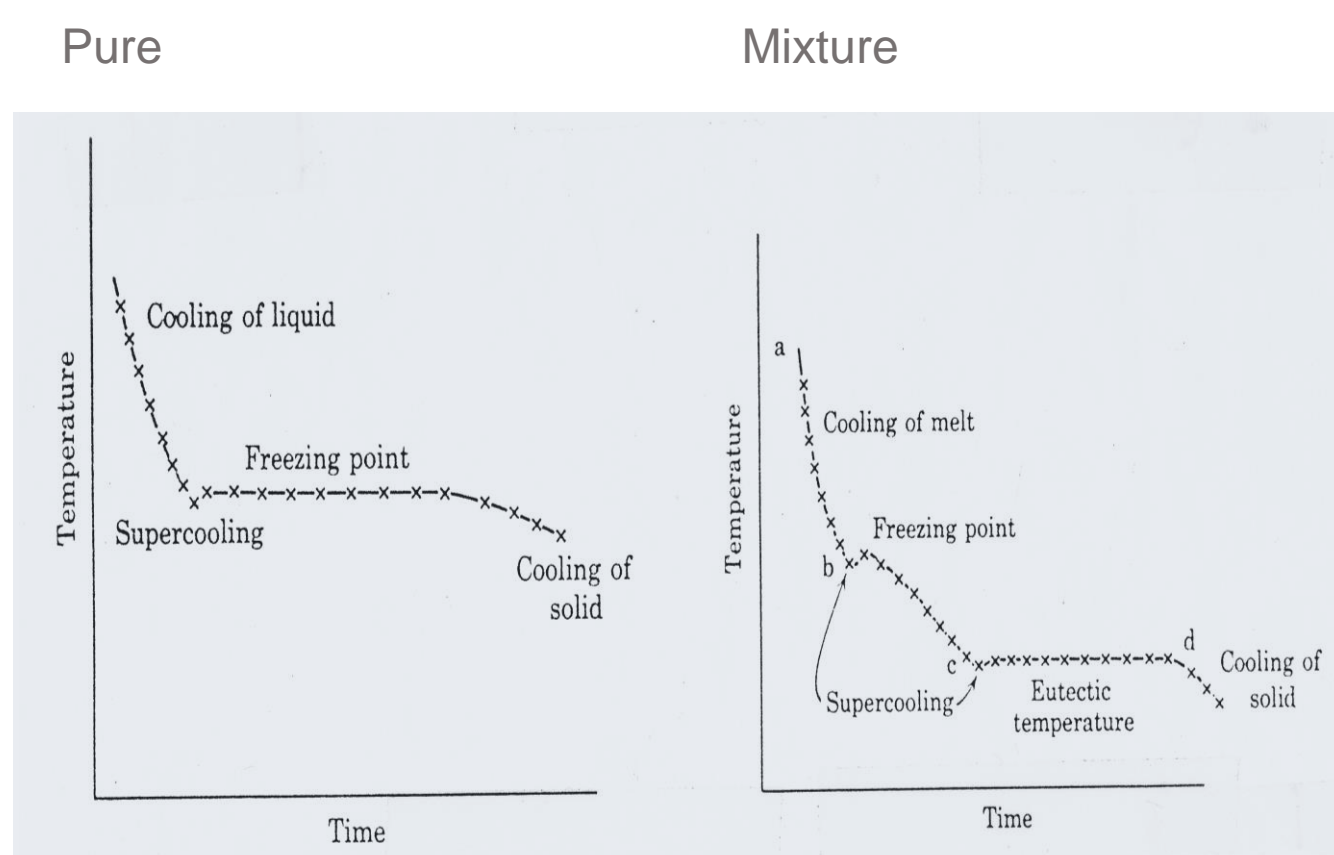
As long as the solutions are sufficiently dilute (i. e., behave ideally)

$$\ln \chi_B = \left(\frac{\Delta_{fus}H}{R} \right) \left(\frac{1}{T^*} - \frac{1}{T} \right)$$

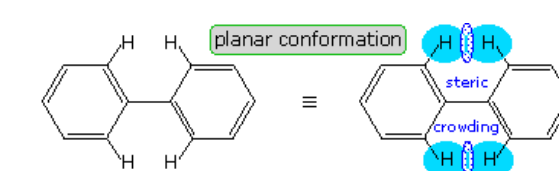
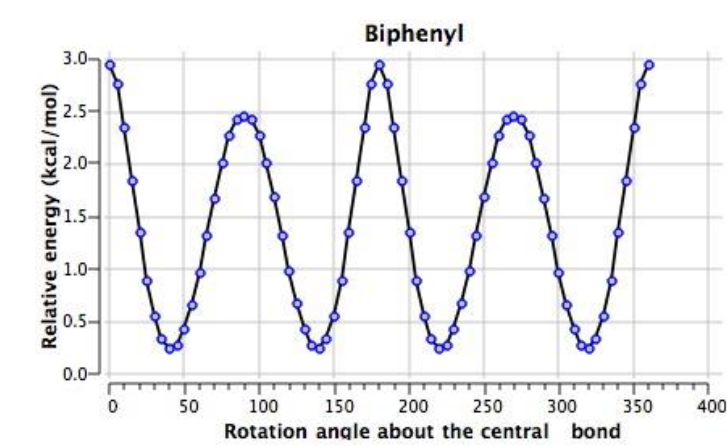
crystallization occurs, T , to the mole fraction of the solute, χ . Also in Eqn. 1 are $\Delta_{fus}H$, the solute's enthalpy of fusion, the solute's melting point, T^* , and the ideal gas constant, R .



Cooling curves



Conformational analysis of biphenyl



Naphthalene

Properties	
Chemical formula	C ₁₀ H ₈
Molar mass	128.17 g·mol ⁻¹
Appearance	White solid crystals/ flakes
Odor	Strong odor of coal tar
Density	1.145 g/cm ³ (15.5 °C) 1.0253 g/cm ³ (20 °C) ^[3] 0.9625 g/cm ³ (100 °C) ^[2]
Melting point	78.2 °C (172.8 °F; 351.3 K) 80.26 °C (176.47 °F; 353.41 K) at 760 mmHg

Biphenyl

Propriedades	
Fórmula química	C ₁₂ H ₁₀
Massa molar	154.21 g mol ⁻¹
Densidade	0.992 g/cm ³
Ponto de fusão	68.93 °C
Ponto de ebulição	256 °C
Solubilidade em água	Insoluble

