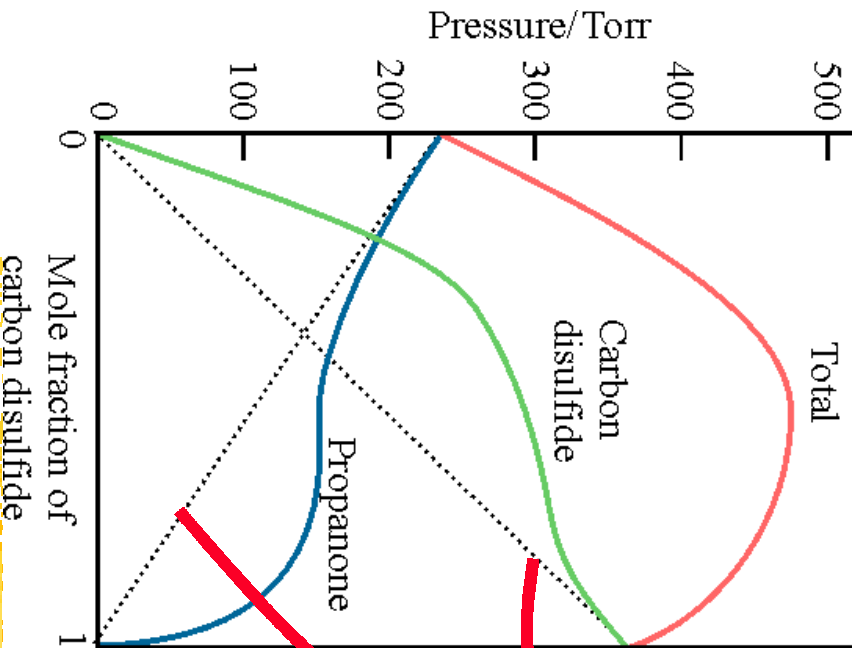


Non-ideal solutions

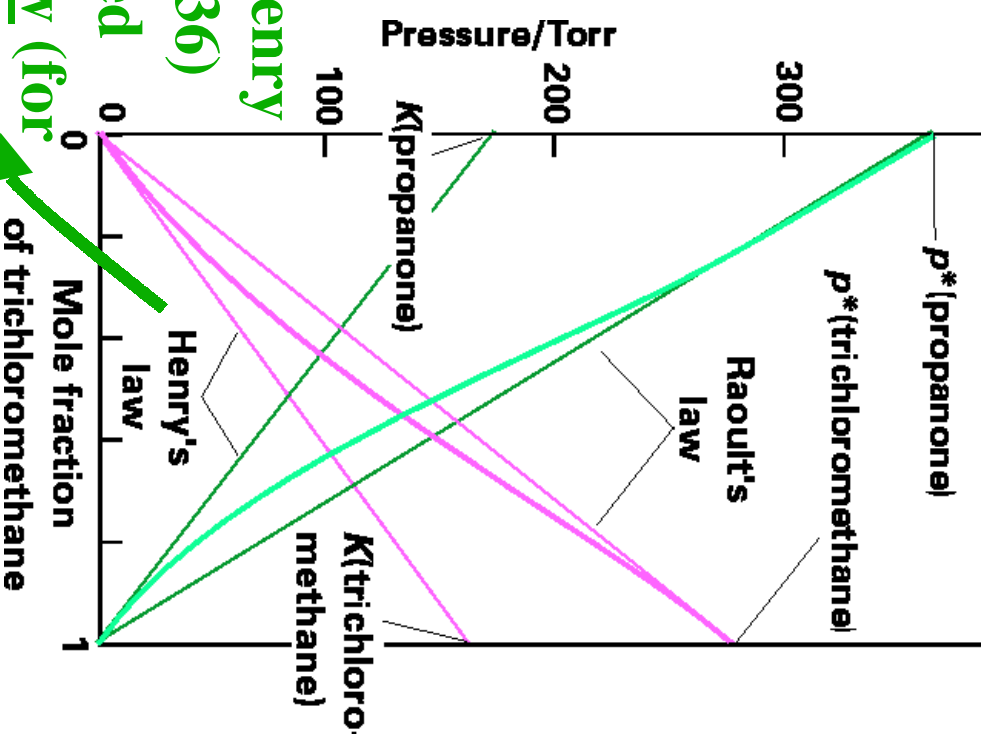
Strong deviations from ideality are shown by dissimilar substances



Raoult's law
obeys for a
close-to-pure
solvent

William Henry
(1775-1836)
observed
Henry's law (for
a dilute solute):

$p_B = x_B K_B$ (e.g., gas solubility)



Ideal and real solutions: Activities

From both Raoult's (solvent) and Henry's laws (solute) follows:

$$\mu^{sol}_j(l) = \mu^{\ominus}_{sol}_j(l) + RT \ln x^{sol}_j$$

$$= \mu^{\ominus}_{sol}_j(l) + RT \ln C[sol]$$

$$\Leftrightarrow \mu_j = \mu^{\ominus}_j + RT \ln [j]$$

standard chemical
potential @ 1 M

The chemical potential is a measure of the ability of J to bring about physical or chemical change

$$\mu_j = \mu^{\ominus}_j + RT \ln a_j$$

Effective concentration
= activity $a_j = \gamma_j [j]$

BUT:
↑↑
to preserve equation for real solutions:

