

Key points of 02/28 lecture

• Van der Waals E-o-S:
$$P = \frac{RT}{v-b} - \frac{a}{v^2} ; v = \frac{V}{N}$$

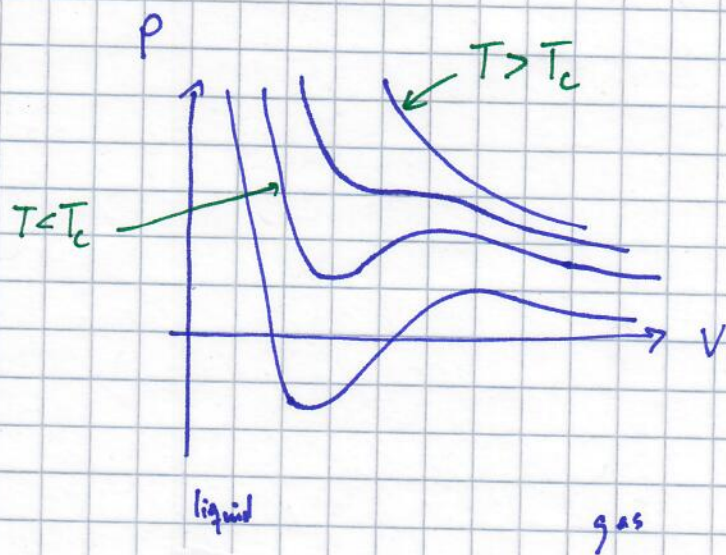
b : "excluded volume per particle"

a : measure of interatomic/
intermolecular attraction

• Stability requires:
$$\left(\frac{\partial P}{\partial v} \right)_T < 0$$

$$\chi_T = - \frac{1}{V} \left(\frac{\partial V}{\partial P} \right)_T > 0$$

↑
isothermal
compressibility



Maxwell construction

removes negative pressure

and
$$\left(\frac{\partial P}{\partial v} \right)_T > 0$$

region.