CH365 Chemical Engineering Thermodynamics

Lesson 15
Review

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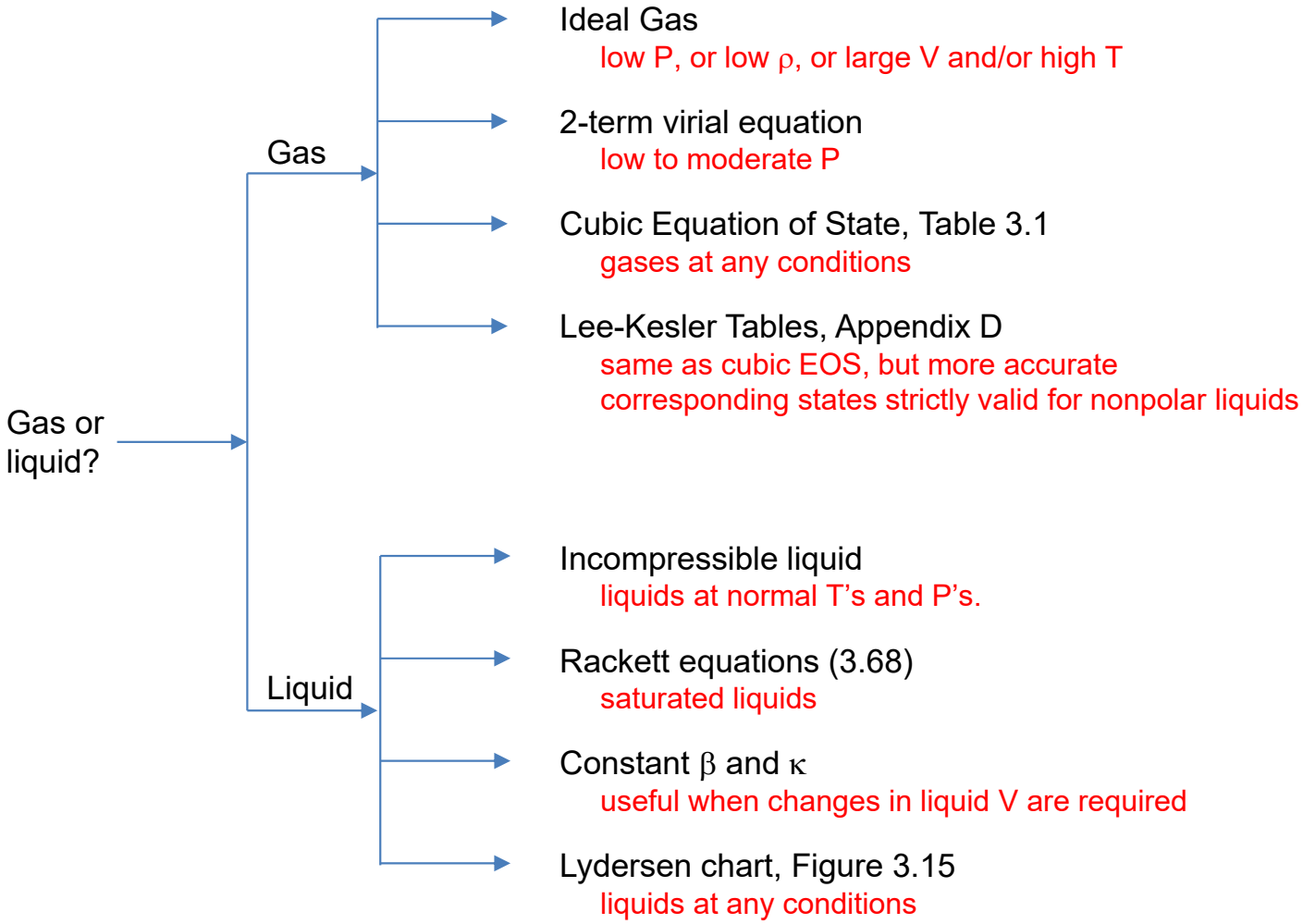
Equation of State Decision Tree



Homework

2^{nd} Virial Coefficients

Can be Derived from Theory

2-molecule pair-wise IMFs

Electrostatic forces
(H atom + H atom $\rightarrow$ H_2)

London dispersion forces
(He, Ne, Ar, Kr, Xe)

Problem 3.78

The *Boyle temperature* is the temperature for which:

$$\lim_{P \to 0} \left(\frac{\partial Z}{\partial P} \right)_T = 0$$

(a) Show that the second virial coefficient B is zero at the Boyle temperature.

(b) Use the generalized correlation for B, Eqs. 3.58 to 3.62, to estimate the reduced Boyle temperature for simple fluids.