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Course 565/665 Lecturer Prof. Cavagnero

Day 3. 22. 04 Date 9:55 am

Notes Taken By Jiang Hong Total Number of Pages ______

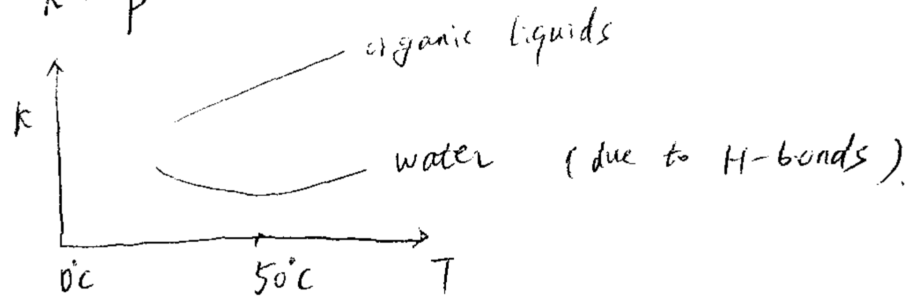
thermal expansion coefficient $\alpha = \frac{1}{V}\left(\frac{\partial V}{\partial T}\right)_p$

for IG. $\alpha = \frac{1}{T}$ (measured at constant p.)

Isothermal compressibility $\kappa = -\frac{1}{V}\left(\frac{\partial V}{\partial p}\right)_T$

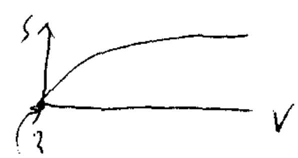
for IG : $\kappa = \frac{1}{p}$

(ex).

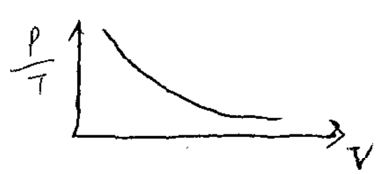


using maxwell relations, α. κ.

$$\left(\frac{\partial S}{\partial V}\right)_{N,U} = \frac{P}{T} \underset{IG}{=} \frac{Nk}{V} \Rightarrow S(V) = Nk\ln V \text{ (+ constant ?)}$$



③



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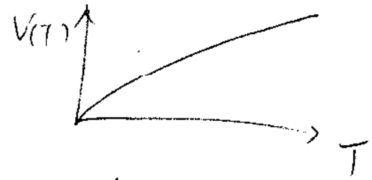
reorganize.

$$V(T) = \frac{NkT}{P}$$



Now get α.

$$\alpha = \left(\frac{\partial V}{\partial T}\right)\frac{1}{V} = \frac{1}{T}$$