

# Thinking Like a Chemist

1/14/14

- What are we going to learn today?
- Note some important details on the syllabus
- Become familiar with the course website
- Meet the teaching team
- Review Mechanics of a learner centered course
- Review the concepts of Thinking Like a Chemist in the context of a review of some material from last semester -
  - Molecular Geometry
  - IMFs
  - Enthalpy, Entropy, Free Energy
- LM daily
- HW Thu due Tue

## Assignments

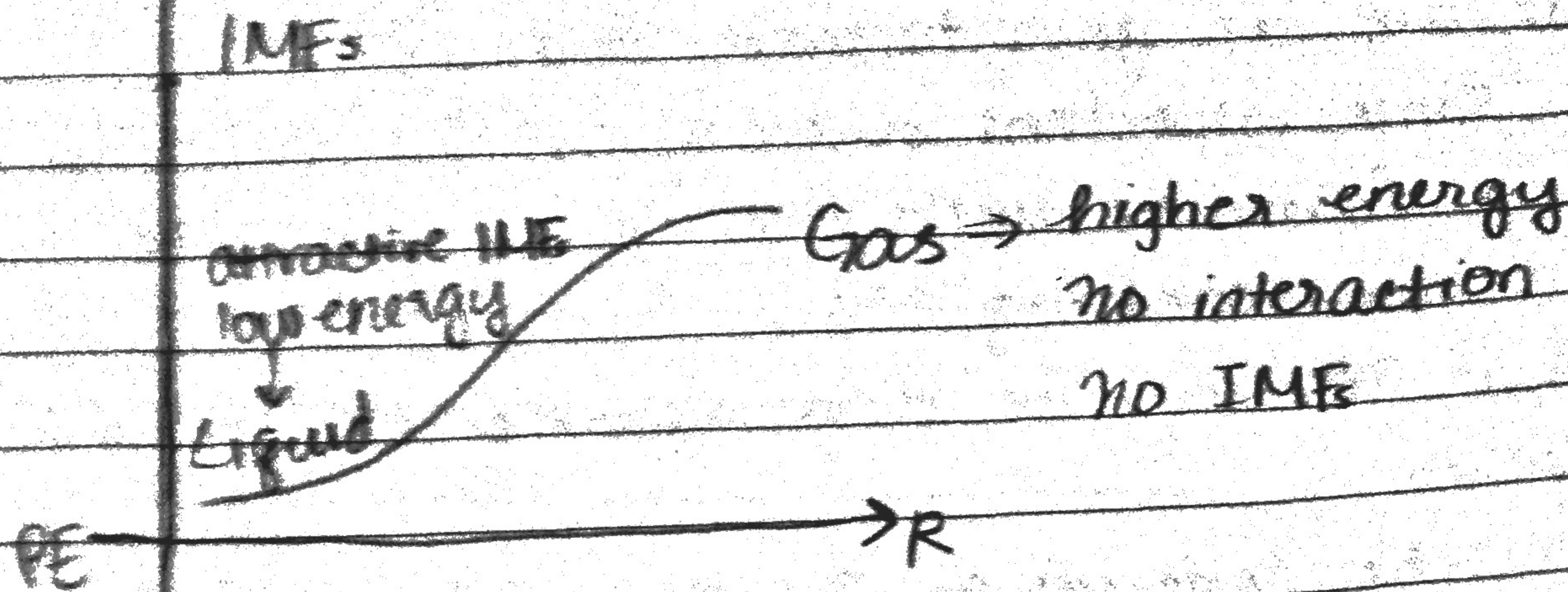
LM 01 - Unit 5

LM 02 - Thermo

LM 03 - Heating Curves

Thinking like a Chemist: Macro/Micro





liquid to gas: positive  $\Delta H_{\text{vap}}$   
 need to put energy in  

$$\Delta H = H_f - H_i = H_{\text{gas}} - H_{\text{liq}} > 0$$

$\Delta H_{\text{vap}}$  is greater for isopropanol because  
 it has H-bond

- What did we learn?

- Enthalpy is related to the "energy"
- liquids - low enthalpy,  
     low energy  
     more stable
- stronger IMFs bigger diff in IMFs



- Entropy  $\uparrow$ :  $\uparrow$  Volume,  $\uparrow$  Temp,  $\uparrow$  # of molecules  
solid  $\rightarrow$  liquid  $\uparrow$

2<sup>nd</sup> Law of Thermo: Universe tends to higher entropy

entropy of liquids & gases are generally same

- Free Energy

lowest  $\rightarrow$  more stable

$$\Delta H = T\Delta S \text{ when } \Delta G = 0$$