

Chapter 12 Lecture Worksheet 1: Intermolecular Forces

Name:

UGA ID:

Instructions:

- Please enter your first and last name as it appears on the eLC roster (do not use a nickname).
- Your UGA myID is a combination of letters and numbers (example: mine is sre13137)
- For multiple choice questions: type the letter corresponding to your answer in the box.
- For ranking questions: type the letters corresponding to your answer in the box with no commas or spaces (example: ABCD)
- Upload this worksheet to Gradescope by 5:00 p.m. on Friday, August 21st.

1. Which chemical equation best represents the process occurring when water boils?

- A. $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2(\text{g}) + \frac{1}{2} \text{O}_2(\text{g})$
- B. $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2(\text{g}) + \frac{1}{2} \text{O}_2(\text{g})$
- C. $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{O}(\text{g})$
- D. $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$

2. Each of the bonds below has one element with a partial negative, δ^- , and one with a partial positive charge, δ^+ . δ^- and δ^+ are opposite in sign but equal in magnitude. Which of these bonds has the largest partial charges on one of the atoms?

- A. N-H
- B. C-H
- C. H-F
- D. B-H
- E. H-H

3. Which of the following compounds exhibit hydrogen bonding in the **pure** liquid?

- A. H_2O
- B. CH_3OCH_3
- C. $\text{CH}_3\text{CH}_2\text{OH}$
- D. CH_3NH_2
- E. $\text{N}(\text{CH}_3)_3$
- F. $\text{CH}_3\text{CO}_2\text{H}$

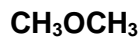
4. Rank the following molecules from most to least polar (ignore molecular weight differences). Do not use comas or spaces (example: ABCD)

- A. CH₄
- B. CH₃F
- C. CH₃Cl
- D. CH₃Br

5. Determine the major IMF for each of these molecules and then rank those IMFs in order of **increasing strength**. Do not use comas or spaces (example: ABCD)

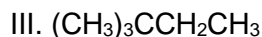
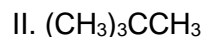
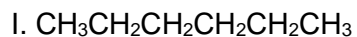
- A. CO₂
- B. NH₃
- C. CHCl₃
- D. CCl₄

6. Identify the strongest intermolecular force for these molecules.

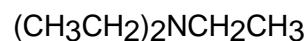
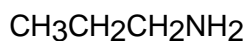


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|----|---------------|---------------|---------------|
| A. | LDF | H-bond | H-Bond |
| B. | Dipole-dipole | LDF | dipole-dipole |
| C. | H-bond | H-bond | dipole-dipole |
| D. | LDF | dipole-dipole | dipole-dipole |
| E. | LDF | H-bond | dipole-dipole |

7. Place the following compounds in order of **decreasing** strength of intermolecular forces. (For example I>II>III)



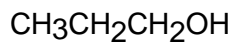
8. How many of these compounds have hydrogen bonding?



9. Which is expected to have the largest dispersion forces?

- A. C_3H_8
- B. $\text{C}_{12}\text{H}_{26}$
- C. F_2
- D. BeCl_2

10. In liquid propanol, which intermolecular forces are present?



- A. Dispersion, hydrogen bonding and dipole-dipole forces are present.
- B. Only dipole-dipole and ion-dipole forces are present.
- C. Only dispersion and dipole-dipole forces are present.
- D. Only hydrogen bonding forces are present.