

Name _____

Period: _____

IMF's

Practice Regents Questions

1. Identify the intermolecular forces that exist in the following molecules.

Compound	Type of IMF
H ₂ O	
N ₂	
HCl	
LiCl	

- ____ 2. The table to the right shows the normal boiling point of four compounds.

Which compound has the strongest intermolecular forces?

- a. HF_(l) c. CH₃F_(l)
b. CH₃Cl_(l) d. HCl_(l)

Compound	Boiling Point (°C)
HF _(l)	19.4
CH ₃ Cl _(l)	- 24.2
CH ₃ F _(l)	- 78.6
HCl _(l)	- 83.7

- ____ 3. Based on intermolecular forces, which of these substances would have the highest boiling point?

- a. He b. O₂ c. CH₄ d. NH₃

- ____ 4. Based on intermolecular forces, which of these substances would have the weakest intermolecular forces?

- a. H₂O b. O₂ c. CH₄ d. NH₃

- ____ 5. As the molecular mass and size of a substance increases, the magnitude of the intermolecular forces between molecules

- a. increase b. decreases c. remains the same

Carbon forms molecular compounds with some elements from Group 16. Two of these compounds are carbon dioxide, CO_2 , and carbon disulfide, CS_2 .

Carbon dioxide is a colorless, odorless gas at room temperature. At standard temperature and pressure, $\text{CO}_{2(s)}$ changes directly to $\text{CO}_{2(g)}$. Carbon disulfide is formed by a direct reaction of carbon and sulfur. At room temperature, CS_2 is a colorless liquid with an offensive odor. Carbon disulfide vapors are flammable.

6. Compare the intermolecular forces in CO_2 and CS_2 at room temperature.

7. In terms of charge distribution, explain why nonpolar molecules usually have much weaker intermolecular attractive forces than polar ones.

8. Using the data table of physical properties of CF_4 and NH_3 to the right, state evidence that indicates the NH_3 has stronger intermolecular forces than CF_4 .

Compound	Melting Point ($^{\circ}\text{C}$)	Boiling Point ($^{\circ}\text{C}$)	Solubility in water
CF_4	- 183.6	- 127.8	Insoluble
NH_3	- 77.7	- 33.3	soluble