

Intermolecular Forces

- For each of the following substances describe the importance of London dispersion forces, dipole-dipole interactions and hydrogen bonding:
a. HCl b. Br₂ c. ICl d. HF e. CH₄
- When one of the H atoms in benzene, C₆H₆ is replaced by another atom or group of atoms, the boiling point changes. Explain the observed boiling points:
a. C₆H₆, 80°C b. C₆H₅Cl, 132°C c. C₆H₅Br, 156°C d. C₆H₅OH, 182°C
- What is the strongest "inter-particle" force (includes ion-ion interaction) that occurs in each of the following substances:
a. CH₃OH b. CCl₄ c. NaI d. H₃PO₄ e. SO₂
- Which member of the following pairs form intermolecular H bonds? Draw H-bonded structures for these:
a. (CH₃)₂NH or (CH₃)₃N
b. HO-CH₂-CH₂-OH or F-CH₂-CH₂-F
- Which has greater polarizability?
a. H₂S or H₂Se
b. CCl₄ or CF₄
c. CH₃-(CH₂)₄-CH₃ or CH₃-CH(CH₃)-(CH₂)₂-CH₃
- Identify the major intermolecular forces in the following cases:
a. liquid CH₄
b. H₂O/CH₃OH mixture
c. LiCl/H₂O solution
- Describe the major intermolecular force that exists in the following substances:
a. O₂ b. CH₃I c. CH₃(CH₂)₇OH
- Which of the following substances will have hydrogen bonds? Show the hydrogen bonded structures:
a. CH₃-O-CH₃
b. CH₄
c. HF
d. Br₂
e. CH₃-OH
f. $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} \begin{array}{l} \diagup \\ \text{OH} \end{array}$